

Appendix D

Data Validation Reports

(Provided Separately)

The data validation reports for Laboratory SDGs JB71607, JB71607R, and JB71607A incorrectly list the sample matrix for the following samples as soil:

- 114-90F-IRM-20140714
- 114-98F-IRM-20140714-E
- 114-98F-IRM-20140714-W

These samples were collected from concrete chips during a July 2014 investigation of potential chromium impacts within the 90 and 98 Forrest Street Buildings.

Data Validation Report

Project:	PPG Garfield Avenue Remedial Investigation – 98 Forrest St Concrete Chips		
Laboratory:	TestAmerica, Edison, NJ		
Laboratory Job No.:	460-63481-1		
Analysis/Method:	Hexavalent Chromium SW846 3060A/7196		
Validation Level:	Full		
Site Location/Address:	98 Forrest St, Jersey City, NJ		
AECOM Project No:	60279173.GA.RI.FOR.CHIP		
Prepared by:	Paula DiMattei /AECOM	Completed on:	10/22/2013
Reviewed by:	Mary Kozik/AECOM	File Name:	460-63481_2013-10-22 DV Report-F.docx

Introduction

The data were reviewed in accordance with the FSP-QAPP and the following NJDEP validation Standard Operating Procedure(s) (SOP):

- NJDEP Office of Data Quality SOP 5.A.10, Rev 3 (September 2009), SOP for Analytical Data Validation of Hexavalent Chromium - for USEPA SW-846 Method 3060A, USEPA SW-846 Method 7196A and USEPA SW-846 Method 7199;

The results of quality control data analyzed with site samples were used to assess the overall reliability of the data. The following qualifiers were used to identify data quality issues:

- U: Indicates the analyte was not detected in the sample above the sample reporting limit.
- J: Indicates the result was an estimated value; the associated numerical value was an approximate concentration of the analyte in the sample.
- UJ: Indicates the analyte was not detected above the reporting limit and the reporting limit was approximate.
- R: The sample result was rejected due to serious deficiencies; the presence or absence of the analyte could not be confirmed.
- RA: The sample result was rejected due to NJ specific data validation QC requirements; however, the result is usable for project objectives. Refer to the Data Quality and Usability section in this data validation report for further discussion.

Sample Information

The samples listed below were collected by AECOM on September 23, 2013 as part of the PPG Garfield Avenue Remedial Investigation –concrete chip sampling at 98 Forrest St., Jersey City, New Jersey. Only the samples and parameters listed below were validated.

Field ID	Laboratory ID	Matrix	Fraction
FB-09232013 (Equipment Blank)	460-63481-6	Aqueous	Hexavalent chromium
FS-CH-EAST-1	460-63481-3	Concrete	Hexavalent chromium
FS-CH-NORTH-1	460-63481-1	Concrete	Hexavalent chromium
FS-CH-SOUTH-1	460-63481-2	Concrete	Hexavalent chromium
FS-CH-WEST-1	460-63481-4	Concrete	Hexavalent chromium
FS-CH-WEST-1-X Field Duplicate of FS-CH-WEST-1	460-63481-5	Concrete	Hexavalent chromium

The samples were collected following the procedures detailed in the Draft Work Scope and Budget Estimate for Site Inspection and Investigation Activities for 98 Forrest Street, Jersey City, New Jersey and the Field Sampling Plan/Quality Assurance Project Plan for Non-Residential and Residential Chromium Sites Hudson County, New Jersey (December 2011).

General Comments

The data package was complete. Quality control (QC) issues identified during validation are discussed below. Refer to the Target Analyte Summary Hit(s) in Attachment A for a listing of all detected results, qualified results, and associated qualifications, where applicable. The nonconformances for each section discussed below are presented in Attachment B.

Hexavalent Chromium

Laboratory Duplicate Results

Sample FS-CH-East-1 was selected by the laboratory to demonstrate laboratory precision capabilities.

The difference between the original result and the duplicate result for sample FS-CH-East-1 did not meet the absolute difference criteria of less than or equal to the reporting limit (RL) for results less than 4X the RL. Since laboratory duplicate criteria were not met, the hexavalent chromium results for all concrete samples in this SDG were qualified as estimated (J).

Field Duplicate Results

Samples FS-CH-West-1 and FS-CH-West-1-X were collected as the field duplicate pair in this SDG.

The relative percent difference for hexavalent chromium exceeded the QC acceptance limits; therefore, the hexavalent chromium results in all concrete samples were qualified as estimated (J).

Data Quality and Usability

In general, these data appear to be valid and may be used for decision-making purposes. No data were rejected. Qualified results, if applicable, are presented in Attachments A and B.

The hexavalent chromium results for all concrete samples are usable as estimated values with an undetermined bias due to the exceeded laboratory and field duplicate precision criteria.

ATTACHMENTS

Attachment A: Target Analyte Summary Hitlist(s)

Attachment B: Data Validation Report Form

Attachment A

Target Analyte Summary Hitlist(s)

Soil Target Analyte Summary Hit List (Hexavalent Chromium)

Site Name PPG –98 Forrest St. Concrete Chip Sampling
Sampling Date September 23, 2013
Lab Name/ID TestAmerica, Edison, NJ
SDG No 460-63481-1
Sample Matrix Concrete chips
Trip Blank ID NA
Field Blank ID FB-09232013

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
FS-CH-EAST-1	460-63481-3	CHROMIUM (HEXAVALENT)	U	2.9	2.9	0.51	Qualify	8, 29
FS-CH-NORTH-1	460-63481-1	CHROMIUM (HEXAVALENT)	U	155	155	10.2	Qualify	8, 29
FS-CH-SOUTH-1	460-63481-2	CHROMIUM (HEXAVALENT)	U	789	789	26.7	Qualify	8, 29
FS-CH-WEST-1	460-63481-4	CHROMIUM (HEXAVALENT)	U	26.6	26.6	0.53	Qualify	8, 29
FS-CH-WEST-1-X	460-63481-5	CHROMIUM (HEXAVALENT)	U	15.1	15.1	0.52	Qualify	8, 29

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

NJDEP Laboratory Footnote

1. The value reported is less than or equal to 3x the value in the preparation/reagent blank. It is the policy of NJDEP-DPFSR to negate the reported value due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
2. The value reported is greater than three (3) times but less than ten (10) times the value in the preparation/reagent blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to the preparation/reagent blank contamination. The "B" qualifier alerts the end-user to the presence of this analyte in the preparation/reagent blank.
3. The value reported is less than or equal to three (3) times the value in the trip/field blank. It is the policy of NJDEP-DPFSR to negate the reported value as due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.

4. The value reported is greater than three (3) times but less than ten (10) times the value in the trip/field blanks and is considered "real". However, the reported value must be quantitatively qualified "J" due to trip/field blank contamination.
5. The concentration reported by the laboratory is incorrectly calculated.
6. The laboratory failed to report the presence of the analyte in the sample.
7. The reported Hexavalent Chromium value was qualified because the Calibration Check Standard was not within the recovery range (90-110 percent).
8. In the Duplicate Sample Analysis, Hexavalent Chromium fell outside the control limits of ± 20 percent for sample results $> 4xRL$ or $+ RL$ for sample results $< 4xRL$. Therefore, the result was qualified.
9. This analyte was rejected because the laboratory performed the Duplicate Analysis on a field blank.
10. The reported value was qualified because the PVS recovery was greater than 115 percent.
11. The reported value was qualified because the PVS recovery was less than 85 percent.
12. The non-detected value was qualified (UJ) because the PVS recovery was less than 85 percent. The possibility of a false negative exists.
13. The reported analyte was qualified because the associated Calibration Blank result was greater than the MDL.
14. The laboratory made a transcription error. No hits were found in the raw data.
15. This analyte is qualified or rejected because the laboratory exceeded the holding time for digestion and/or analysis.
16. The laboratory subtracted the preparation/reagent blank from the sample result. The Reviewer's calculation puts the preparation/reagent blank back into the result.
17. The photocopy is unreadable. Therefore, the QA reviewer cannot read the laboratory's reported concentration result.
18. The reported value was qualified because the predigestion spike recovery was less than 75 %, but greater than 50%.
19. The reported value was qualified because the predigestion spike recovery was greater than 125 percent.

20. The non-detected value was qualified (UJ) because the redigestion spike recovery was less than 75 percent. The possibility of a false negative exists.
21. The reported result was qualified or rejected because the laboratory did not record the pH value(s) of the sample in a laboratory notebook.
22. The reported value was qualified (J/UJ) because the sample moisture content exceeded 50 percent.
23. The sample result was rejected because the soluble and insoluble matrix spike recoveries were less than 50%.
24. The detected sample result was qualified (J) because the incorrect spike concentration was used.
25. The reported sample results were rejected because the predigestion spike recovery was greater than 150 percent.
26. The reported sample results were rejected because the redigestion spike recovery was greater than 150 percent.
27. The reported value was qualified (J) because the redigestion spike recovery was less than 75 percent.
28. The reported value was qualified (J/UJ) because the sample digestion temperature was less than 90C.
29. In the Field Duplicate Sample Analysis, Hexavalent Chromium fell outside the control limits of $\pm 20\%$ for sample results $> 4xRL$ or $+ RL$ for sample results $< 4xRL$. Therefore, the result was qualified.
30. The reported value was qualified as estimated (J/UJ) but the bias is uncertain due to both high and low MS recoveries.
31. The reported result was greater than the MDL but less than the RL and qualified (J) as estimated by the laboratory.
32. The reported value was qualified because the sample replicate precision criterion of $< 20\%$ for method 7199 was exceeded.
33. The reported value was qualified (J/UJ) because the laboratory control sample (LCS) recovery was less than 80%.
34. The reported value was qualified (J) because the laboratory control sample (LCS) recovery was greater than 120%.
35. The reported result was qualified because the matrix spike analysis was not performed at the proper frequency.

36. The reported result was qualified because the laboratory duplicate analysis was not performed at the proper frequency.
37. The result was qualified because the cooler temperature upon sample receipt exceeded 6C.
38. The reported value was qualified because the redigestion spike recovery was greater than 125 percent.
39. The reported result was rejected because the laboratory failed to perform the reanalysis due to insufficient sample volume.
40. The reported results was qualified because the laboratory failed to analyze an ending CCB.
41. The reported result was qualified because the laboratory failed to make the proper method specific pH adjustment.
42. The reported result was rejected because the laboratory failed to reanalyze the MS and associated sample(s) due to failed MS recoveries.

Attachment B

Data Validation Report Form

Client Name: PPG Industries	Project Number: 60279173.GA.RI.FOR.CHIP
Site Location: PPG Garfield Avenue Remedial Investigation – 98 Forrest St Concrete Chips	Project Manager: Bill Spronz
Laboratory: Accutest, Dayton, NJ	Type of Validation: Full
Laboratory Job No: 460-643481	Date Checked: 10/23/13
Validator: Paula DiMattei	Peer: Mary Kozik

ITEM	YES	NO	N/A	COMMENTS
Sample results included?	X			
Reporting Limits met project requirements?		X		Elevated RLs resulted from required dilutions. However, there are no elevated ND results.
Field I.D. included?	X			
Laboratory I.D. included?	X			
Sample matrix included?	X			
Sample receipt temperature 2-6C?	X			
Signed COCs included?	X			
Date of sample collection included?	X			
Date of sample digestion included?	X			
Holding time to digestion met criteria? (Soils -30 days from collection to digestion.)	X			
Date of analysis included?	X			
Holding time to analysis met criteria? (Soils -168 hours from digestion to analysis; Aqueous - 24 hours from collection to analysis.)	X			
Method reference included?	X			
Laboratory Case Narrative included?	X			

Definitions: MDL - Method Detection Limit; %R - Percent Recovery; RL - Reporting Limit; RPD - Relative Percent Difference; RSD - Relative Standard Deviation :Corr - Correlation Coefficient.

ITEM	YES	NO	N/A	COMMENTS
Initial calibration documentation included in lab package?	X			
1) Blank plus 4 standards (7196A) or blank plus 3 standards (7199)	X			
2) Correlation coefficient of >0.995 (7196A) or >0.999 (7199)	X			
3) Calibrate daily or each time instrument is set up.	X			
Calibration Check Standard (CCS) for 7196A and Quality Control Sample (QCS) for 7199 Included in Lab Package?	X			
1) %R criteria met? (90 - 110%)	X			
2) Correct frequency of one per every 10 samples	X			
3) CCS and QCS from independent source and at mid-level of calibration curve	X			
Calibration Blanks	X			
1) Analyzed prior to initial calibration standards and after each CCS/QCS?	X			
2) Absolute value should not exceed MDL.	X			
Method Blank, Field Blanks and/or Equipment Blanks Included in Lab Package?	X			FB-09232013
1) Method blank analyzed with each preparation batch?	X			
2) Absolute value should not exceed MDL.	X			
Eh and pH Data	X			
1) Eh and pH data was included and plotted for all samples?	X			
Soluble Matrix Spike Data Included in Lab Package?	X			FS-CH-East-1
1) Soluble Matrix %R criteria met? (75-125%R)	X			
2) Was the spike concentration 40 mg/Kg or twice the sample concentration?	X			
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	X			
Insoluble Matrix Spike Data Included in Lab Package?	X			
1) Insoluble Matrix %R criteria met? (75-125%R)	X			
2) Was the spike concentration around 400 to 800 mg/Kg?	X			
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	X			
Post Digestion Spike	X			

ITEM	YES	NO	N/A	COMMENTS
1) Post Digestion Spike %R criteria met? (85-115%R)	X			
2) Was the spike concentration 40 mg/Kg or twice the sample concentration?	X			
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	X			
Sample Duplicate Data Included in Lab Package?	X			FS-CH-East-1
1) RPD criteria met? (RPD ≤ 20%) if both results are =4x RL or absolute difference ≤ RL if either or both results are <4xRL		X		See nonconformance table below
2) Was a sample duplicate analyzed at the frequency of 1 per batch or 20 samples?	X			
Was a Laboratory Control Sample (LCS) Included in Lab Package?	X			
1) %R criteria met? (80-120%R)	X			
2) Was an LCS analyzed at the frequency of 1/batch or 20 samples?	X			
Were any Field Duplicate samples submitted with this SDG?	X			
1) Were Field duplicate RPD criteria met? (RPD ≤ 20% for both sample results >4xRL or absolute difference ≤ RL if either or both results are <4xRL.		X		See nonconformance summary below
Were all sample quantitation and reporting requirements met?	X			
1) Were all solid samples reported with percent solids >50%?	X			
2) Were any samples analyzed or reported with dilutions?	X			
Miscellaneous Items				
1) For soils by 7196A, was the pH within a range of 7.0-8.0?	X			
2) For soils by 7199, was the pH within a range of 9.0-9.5?			X	
3) For aqueous by 7196A, was the pH with a range of 1.5-2.5?	X			
4) For soils (3060A), was the digestion temperature 90-95C for at least 60 minutes?	X			
5) For 7199, was each sample injected twice and was the RPD <20?			X	

Laboratory Duplicates

Sample ID	Duplicate ID	Analyte	Sample Result	Duplicate Result	QL	Units	RPD
FS-CH-East-1	FS-CH-East-1	CHROMIUM (HEXAVALENT)	2.9	6.0	2.0	mg/kg	71

Field Duplicates

Sample ID	Duplicate ID	Analyte	Sample Result	Duplicate Result	QL	Units	RPD
FS-CH-West-1	FS-CH-West-1-X	CHROMIUM (HEXAVALENT)	26.1	15.1	2.1	mg/kg	53.4

SDG#: 460-643481-1

Batch: 184578

Cr+6 ICAL 10/3/2013

Solid

(p. 95 of data pkg)

x - concentration	y - response
0	0
0.05	0.042
0.1	0.086
0.5	0.427
0.75	0.611
1.25	1.012

(p. 95 of data pkg)

AECOM Calculated Intercept	0.0054	OK	Reported intercept	-6.4340
AECOM Slope	0.8097	OK	Reported Slope	1234
AECOM Calculated r	0.99978	OK	Reported r	1.00000

LCS calculation

LCS Sol pgs. 65, 93

Background Absorbance	0
Total absorbance	0.305
Total absorbance - background	0.305
Instrument Concentration	0.370
Sample weight (mg/kg)	0.0025
Final Volume (L)	0.1
Dilution Factor	1

AECOM Calculated LCS Result (mg/Kg)	14.8	OK	Reported Result (mg/Kg)	14.8
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%R = Found/True*100

pg. 462

True Value (mg/kg)	15.2
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AECOM Calculated %R	97.4	OK	Reported %R	97
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MS calculation

FS-CH-East-1 p.60, 93

Background reading	0.013
Total absorbance	0.882
Total absorbance - background	0.869
Instrument Concentration	1.067
Sample weight (mg/kg)	0.0025
Final Volume (L)	0.1
Percent solids	0.978
Dilution Factor	1

AECOM Calculated MS Result (mg/Kg)	43.62	OK	Reported Result (mg/Kg)	43.62
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%R = Found/True*100

[174-S121-8.0] pg. 455

True Value (mg/kg)	40.9
Native concentration (mg/Kg)	2.9

AECOM %R	99.6	OK rounding	Reported %R	100
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Percent Solids

FS-CH-East-1 p.111

Empty dish weight=	1
Wet weight=	6.78

Dry weight=	6.65		
AECOM%solids =	97.8	OK	reported %solids= 97.8

Reporting Limit**FS-CH-East-1 p.111**

Low Standard	0.05		
Initial weight (mg/kg)	0.0025		
Final volume (L)	0.1		
Percent solids	0.98		
Dilution Factor	1.00		
Reporting Limit	2.04	OK rounding	Reported RL (mg/Kg)= 2.0

Sample Calculations**FS-CH-East-1****pgs.42, 93**

Background reading	0.007		
Total absorbance	0.069		
Total absorbance - background	0.062		
Instrument Response	0.070		
Sample weight (mg/kg)	0.0025		
Final Volume (L)	0.1		
Percent solids	0.978		
Dilution Factor	1		
AECOM Calculated Result (mg/Kg)	2.9	OK	Reported Result (mg/Kg) 2.9

Data Validation Report

Project	PPG – GA EF	Page	1
Laboratory	Test America, NJ		
Laboratory Job No.:	460-25190		
Analysis/Method:	Hexavalent Chromium SW846 3060A/7196A (including pH and Eh)		
Validation Level:	Full		
Site Location/Address:	Garfield Avenue Soil RI, Site 114, Jersey City, NJ		
AECOM Project Number:	60158739-0007		
Prepared by: Justin Webster/AECOM	Completed on: May 13, 2011		
Reviewed by: Lisa Krowitz/AECOM	File Name: 2011-05-13 Hex Cr DV Report 460-25190-F.docx		

Introduction

The results of quality control data analyzed with site samples were used to assess the overall reliability of the data. The following qualifiers were used to identify data quality issues:

- U: Indicates the analyte was not detected in the sample above the sample reporting limit
- J: Indicates the result was an estimated value; the associated numerical value was an approximate concentration of the analyte in the sample (“J-“ indicates low bias “J+” indicates high bias)
- UJ: Indicates the analyte was not detected above the reporting limit and the reporting limit was approximate.
- R: The sample result was rejected due to serious deficiencies; the presence or absence of the analyte could not be confirmed.

Sample Information

The samples listed below were collected by AECOM on April 11, 2011 as part of the Garfield Avenue Soil RI sampling task at PPG Site 114, Jersey City, New Jersey.

Field ID	Laboratory ID	Matrix	Fraction
EF-B03-0.5	460-25190-1	Soil	Hexavalent Chromium
EF-B03-2.0	460-25190-2	Soil	Hexavalent Chromium
EF-B03-4.0	460-25190-4	Soil	Hexavalent Chromium
EF-B04-0.5	460-25190-5	Soil	Hexavalent Chromium
EF-B04-2.0	460-25190-6	Soil	Hexavalent Chromium
EF-B04-4.0	460-25190-8	Soil	Hexavalent Chromium
EF-B05-0.5	460-25190-9	Soil	Hexavalent Chromium
EF-B05-2.0	460-25190-10	Soil	Hexavalent Chromium
EB041111 (field blank)	460-25190-12	Aqueous	Hexavalent Chromium

The samples were collected following the procedures detailed in the NJDEP – Approved Remedial Investigation Work Plan – Soil Non-Residential Chromate Chemical Production Waste Sites 114, 132, 133, 135, 137, 143, and 186 (March 2011).

General Comments

The data package was complete. Quality control (QC) issues identified during validation are discussed below. Refer to the Soil and Aqueous Target Analyte Summary Hit List for a listing of all detected results, qualified results, and associated qualifications, where applicable.

Matrix Spike Results

Soil sample EF-B04-4.0 was selected for soluble and insoluble matrix spike analysis. The soluble and insoluble matrix spike recoveries were with quality control criteria of 75-125%; therefore, no qualifications were required.

Equipment Blank Contamination

Hexavalent chromium was detected in the equipment blank EB-041111 at a concentration of 1.6 µg/L which was above the MDL (1.5 µg/L), but below the RL (10 µg/L). However, reported soil results were not impacted since the detected results and the reporting limits for the nondetect results were greater than the blank action level of ten times the amount found in the associated equipment blank (16 µg/L).

Sample Reporting Limits

Samples EF-B04-0.5, EF-B04-2.0, and EB-041111 were qualified “J”, as estimated by the laboratory. The reported results were less than the reporting limit (RL), but greater than or equal to the method detection limit (MDL) and; therefore, are approximate values.

Data Quality and Recommendations

In general, these data appear to be valid as reported by the laboratory and may be used for decision making purposes. No data were rejected. Qualified results were discussed in Attachments A and B below.

Attachments

Attachment A Target Analyte Summary Hitlist(s)

Attachment B Data Validation Report Form

Attachment A

Target Analyte Summary Hitlist(s)

Soil Target Analyte Summary Hit List

Site Name PPG GAEF Site 114, Jersey City, NJ
Sampling Date April 11, 2011
Lab Name/ID TestAmerica, Edison, NJ
SDG No 460-25190
Sample Matrix Soil
Trip Blank ID NA
Field Blank ID EB041111

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
EF-B03-4.0	460-25190-4	CHROMIUM (HEXAVALENT)	U	2.7	2.7	2.2		
EF-B04-0.5	460-25190-5	CHROMIUM (HEXAVALENT)	U	1.8	1.8	2.1	qualify	13
EF-B04-2.0	460-25190-6	CHROMIUM (HEXAVALENT)	U	1.8	1.8	2.2	qualify	13
EF-B05-0.5	460-25190-9	CHROMIUM (HEXAVALENT)	U	20.4	20.4	2.3		
EF-B05-2.0	460-25190-10	CHROMIUM (HEXAVALENT)	U	18.2	18.2	2.4		

Note: The "U" under Method Blank column indicates a nondetect result.
 The "U" under the Laboratory Sample Result and Validation Sample Result columns indicate a nondetect result at the RL.

NJDEP Validation Footnote

13. The reported analyte was qualified because the result was greater than the MDL but below the RL.

Aqueous Target Analyte Summary Hit List

Site Name PPG GAEF Site 114, Jersey City, NJ
Sampling Date April 11, 2011
Lab Name/ID TestAmerica, Edison, NJ
SDG No 460-25190
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID EB041111

Field Sample ID	Lab Sample ID	Analyte	Method Blank (µg/L)	Laboratory Sample Result (µg/L)	Validation Sample Result (µg/L)	RL (µg/L)	Quality Assurance Decision	NJDEP Validation Footnote
EB041111	460-25190-12	CHROMIUM (HEXAVALENT)	U	1.6	1.6	10.0	qualify	13

Note: The "U" under Method Blank column indicates a nondetect result.
 The "U" under the Laboratory Sample Result and Validation Sample Result columns indicate a nondetect result at the RL.

NJDEP Validation Footnote

13. The reported analyte was qualified because the result was greater than the MDL but below the RL.

Attachment B

Data Validation Report Form

Client Name: PPG Industries	Project Number: 60154801-0007
Site Location: PPG-GAEF	Project Manager: Robert Cataldo
Laboratory: TestAmerica, New Jersey	Limited or <u>Full Validation</u> (circle one)
Laboratory Job No: 460-25190	Date Checked: 5/12/2011
Validator: Justin Webster	Peer: Lisa Krowitz

ITEM	YES	NO	N/A	COMMENTS
Sample results included?	x			1 Aqs TBs and 8 Soils
Reporting Limits met project requirements?	x			Ranging from 2.1 mg/kg to 2.4 mg/kg
Field I.D. included?	x			
Laboratory I.D. included?	x			
Sample matrix included?	x			
Sample receipt temperature 2-6°C?	x			4.4°C
Signed COCs included?	x			
Date of sample collection included?	x			4/11/11
Date of sample digestion included?	x			Soil extraction on 4/14/11
Holding time to digestion met criteria? Soils -30 days from collection to digestion.	x			See table below "Holding Times"
Date of analysis included?	x			Aqs analysis 4/12/11, Soil analysis 4/15/11
Holding time to analysis met criteria? Soils -168 hours from digestion to analysis. Aqueous – 24 hours from collection to analysis.	x			See table below "Holding Times"
Method reference included?	x			3060A/7196A
Laboratory Case Narrative included?	x			
Definitions: MDL – Method Detection Limit; %R – Percent Recovery; RL – Reporting Limit; RPD – Relative Percent Difference; RSD – Relative Standard Deviation :Corr – Correlation Coefficient.				
Comments				
Field Duplicates: Not applicable for this SDG				

Sample dilutions: NA

ITEM	YES	NO	N/A	COMMENTS
Initial Calibration Documentation Included in Lab Package?	x			Cal source (soils WThcrIM00022) (aqs WThcrIM2-00022)
1. Blank plus 4 standards (7196A) or blank plus 3 standards (7199), 2. Correlation coefficient of ≥ 0.995 (7196A) or ≥ 0.999 (7199). 3. Calibrate daily or each time instrument is set up.	x			1. Each analysis 1 blank and 5 cal STDs 2. All analysis meet CC 3. yes
Calibration Check Standard (CCS) for 7196A and Quality Control Sample (QCS) for 7199 Included in Lab Package?	x			Check source (soils WThcrIM3-00011) (aqs WThcrIM4-00024)
1. %R criteria met? (90 - 110%). 2. Correct frequency of once every 10 samples 3. CCS and QCS from independent source and at mid level of calibration curve.	x			1. All met %R 2. Analyzed every 10 samples 3. Yes
Calibration Blanks	x			Aqs – 460-70227/1 and Soil 460-70693/1
1. Analyzed prior to initial calibration standards and after each CCS/QCS? 2. Absolute value should not exceed MDL.	x			1. Yes 2. Yes
Method Blank and Field Blanks Included in Lab Package?	x			Field blank included with this SDG EB041111
1. Method blank analyzed with each preparation batch? 2. Absolute value should not exceed MDL.	x	X*		1. Yes, aqs – 460-70227/9 and soils – 70559/1-A 2. No, equipment blank EB041111 exceeded MDL at 1.6 $\mu\text{g/l}$. However all sample results were > 10x the EB conc of 1.6 $\mu\text{g/l}$, thus no quals were applied.
Eh and pH data .	x			
Eh and pH data was included and plotted for all samples?	x			All samples indicate oxidative conditions
Soluble Matrix Spike Data Included in Lab Package?	x			460-25190-8 (EF-B04-4.0)
1. %R criteria met? (75-125%R). 2. Was the spike concentration 40 mg/Kg? 3. Was a sample spiked at the frequency of 1/batch or 20 samples?	x	X*		1. Yes, 86% 2. No, 37.74 mg/kg 3. yes
Insoluble Matrix Spike Data Included in Lab Package?	x			460-25190-8 (EF-B04-4.0)
1. %R criteria met? (75-125%R). 2. Was the spike concentration 400 to 800 mg/Kg? 3. Was a sample spiked at the frequency of 1/batch or 20 samples?	x			1. Yes, 104% 2. Yes, 781 mg/kg 3. yes
Post Digestion Spike	x			460-25190-8 (EF-B04-4.0)
1. %R criteria met? (85-115%R). 2. Was the spike concentration 40 mg/Kg or twice the sample concentration? 3. Was a sample spiked at the frequency of 1/batch or 20 samples?	x			1. Yes, 111% 2. Yes, 44.1 mg/kg 3. yes
Sample Duplicate Data Included in Lab Package?	x			460-25190-8 (EF-B04-4.0)
1. RPD criteria met? (RPD < 20%) of both results are $\geq 4x$ RL or control limit of $\pm RL$ if both results are $< 4x$ RL. 2. Was a sample spiked at the frequency of 1/batch or 20 samples?	x			1. The RPD was NC due to nondetect results for both the original and duplicate samples.
Was a Laboratory Control Sample (LCS) Included in Lab Package?	x			
1. %R criteria met? (80-120%R). 2. Was an LCS analyzed at the frequency of 1/batch or 20 samples?	x			1. Yes 2. yes
Miscellaneous Items.				
1. For soils by 7196A, was the pH within a range of 7.0-8.0? 2. For soils by 7199, was the pH within a range of 9.0-9.5? 3. For aqueous by 7196A, was the pH with a range of 1.5-2.5? 4. For soils (3060A), was the digestion temperature 90-95°C for at least 60 minutes? 5. For 7199, was each sample injected twice and was the RPD ≤ 20 ?	x			1. Yes 2. NA 3. Yes 4. Yes 5. NA

Holding Times

Sample ID	Method	Days from Sampling to Prep	Days from Prep to Analysis	Days from Sampling to Analysis	SP Status	PA Status	SA Status
EF-B03-0.5	SW7196	3	1	4	OK @30 days	OK @7 days	OK @37 days
EF-B03-2.0	SW7196	3	1	4	OK @30 days	OK @7 days	OK @37 days
EF-B03-4.0	SW7196	3	1	4	OK @30 days	OK @7 days	OK @37 days
EF-B04-0.5	SW7196	3	1	4	OK @30 days	OK @7 days	OK @37 days
EF-B04-2.0	SW7196	3	1	4	OK @30 days	OK @7 days	OK @37 days
EF-B04-4.0	SW7196	3	1	4	OK @30 days	OK @7 days	OK @37 days
EF-B05-0.5	SW7196	3	1	4	OK @30 days	OK @7 days	OK @37 days
EF-B05-2.0	SW7196	3	1	4	OK @30 days	OK @7 days	OK @37 days
EB041111	SW7196			1			OK @1 days

SDG#: 460-25190

Cr+6 ICAL -04/15/11
Soils
(p. 2136 of data pkg)

x - concentration	y - response
0	0
50	0.042
100	0.084
500	0.399
750	0.6
1250	0.992

(p. 2136 of data pkg)

AECOM Calculated Intercept	-3.3272	OK	Reported intercept	-3.3270
AECOM Slope	1261	OK	Reported Slope	1261
AECOM Calculated r	0.99999	OK	Reported r	1.00000

EF-B04-4.0 (460-25190-8)

p. 2143 of data pkg

Background reading	0.005
Total absorbance	0.007
Total absorbance - background	0.002
Instrument Response (µg/L)	-0.805
Sample weight (g)	2.5
Final Volume (mL)	100
Percent solids	0.907
Dilution Factor	1

AECOM Calculated Result (mg/Kg)	0.0	OK sample ND	Reported Result (mg/Kg)	2.2 U
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LCS calculation

LCSS 460-70559/2-A pg. 2143

LCS Soluble Instrument Response	0.477
Instrument Concentration (ug/L)	598.266
Sample weight	2.5
Percent solids	1
Dilution Factor	1

AECOM Calculated LCS Result (mg/Kg)	23.93	OK	Reported Result (mg/Kg)	23.93
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%R = Found/True*100

True Value (mg/kg)	25.4
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AECOM Calculated %R	94.2	OK rounding	Reported %R	94
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MS calculation

p. 2143 460-25190-A-8-D MSS (EF-B04-4.0)

MS Insoluble Instrument Response	0.685	background subtracted
Instrument Concentration (ug/L)	860.596	
Sample weight (g)	2.5	
Percent solids	0.907	
Dilution Factor	1	

AECOM Calculated MS Result (mg/Kg)	37.95	OK rounding	Reported Result (mg/Kg)	37.74
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%R = Found/True*100

pg. 2097

True Value (mg/kg)	44.1
Native concentration (g)	0

%R	86.1	OK rounding	Reported %R	86
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Percent Solids

pg. 2146

Empty dish weight=	0.99
Wet weight=	7.42
Dry weight=	6.82

AECOM %solids =	90.7	OK	TestAmerica reported %solids=	90.7
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EF-B04-4.0 (460-25190-8)

pg. 2143

AECOM

Low Standard	50			
Initial weight (g)	2.5			
Final volume (mL)	100			
Percent solids	0.91			
Dilution Factor	1.00			
Reporting Limit	2.2	OK	Reported RL (mg/Kg)=	2.2

EF-B03-0.5 (460-25190-1)		p. 2143of data pkg		
Background reading	0.005			
Total absorbance	0.013			
Total absorbance - background	0.008			
Instrument Response (µg/L)	6.762			
Sample weight (g)	2.51			
Final Volume (mL)	100			
Percent solids	0.906			
Dilution Factor	1			
AECOM Calculated Result (mg/Kg)	0.3	OK sample ND	Reported Result (mg/Kg)	2.2 U

EF-B03-2.0 (460-25190-2)		p. 2143of data pkg		
Background reading	0.004			
Total absorbance	0.009			
Total absorbance - background	0.005			
Instrument Response (µg/L)	2.979			
Sample weight (g)	248			
Final Volume (mL)	100			
Percent solids	0.892			
Dilution Factor	1			
AECOM Calculated Result (mg/Kg)	0.0	OK sample ND	Reported Result (mg/Kg)	2.3 U

EF-B03-4.0 (460-25190-4)		p. 2143of data pkg		
Background reading	0			
Total absorbance	0.051			
Total absorbance - background	0.051			
Instrument Response (µg/L)	60.994			
Sample weight (g)	2.55			
Final Volume (mL)	100			
Percent solids	0.886			
Dilution Factor	1			
AECOM Calculated Result (mg/Kg)	2.7		Reported Result (mg/Kg)	2.7

EF-B04-0.5 (460-25190-5)		p. 2143of data pkg		
Background reading	0			
Total absorbance	0.036			
Total absorbance - background	0.036			
Instrument Response (µg/L)	42.076			
Sample weight (g)	2.5			
Final Volume (mL)	100			
Percent solids	0.939			
Dilution Factor	1			
AECOM Calculated Result (mg/Kg)	1.8		Reported Result (mg/Kg)	1.8

EF-B04-2.0 (460-25190-6)		p. 2143of data pkg	
Background reading	0		
Total absorbance	0.035		
Total absorbance - background	0.035		
Instrument Response (µg/L)	40.815		
Sample weight (g)	2.49		
Final Volume (mL)	100		
Percent solids	0.919		
Dilution Factor	1		
AECOM Calculated Result (mg/Kg)	1.8	Reported Result (mg/Kg)	1.8

EF-B05-0.5 (460-25190-9)		p. 2143of data pkg	
Background reading	0		
Total absorbance	0.361		
Total absorbance - background	0.361		
Instrument Response (µg/L)	451.966		
Sample weight (g)	2.54		
Final Volume (mL)	100		
Percent solids	0.874		
Dilution Factor	1		
AECOM Calculated Result (mg/Kg)	20.4	Reported Result (mg/Kg)	20.4

EF-B05-2.0 (460-25190-10)		p. 2143of data pkg	
Background reading	0.001		
Total absorbance	0.303		
Total absorbance - background	0.302		
Instrument Response (µg/L)	377.556		
Sample weight (g)	2.53		
Final Volume (mL)	100		
Percent solids	0.818		
Dilution Factor	1		
AECOM Calculated Result (mg/Kg)	18.2	Reported Result (mg/Kg)	18.2

Data Validation Report

Project	PPG –GA EF	Page	1
Laboratory	Test America, NJ		
Laboratory Job No.:	460-25301		
Analysis/Method:	Hexavalent Chromium SW846 3060A/7196A (including pH and Eh)		
Validation Level:	Full		
Site Location/Address:	Garfield Avenue Soil FI, Site 114, Jersey City, NJ		
AECOM Project Number:	60158739-0007		
Prepared by: Justin Webster/AECOM	Completed on: May 13, 2011		
Reviewed by: Lisa Krowitz/AECOM	File Name: 2011-05-13 Hex Cr DV Report 460-25301-F.docx		

Introduction

The results of quality control data analyzed with site samples were used to assess the overall reliability of the data. The following qualifiers were used to identify data quality issues:

- U: Indicates the analyte was not detected in the sample above the sample reporting limit
- J: Indicates the result was an estimated value; the associated numerical value was an approximate concentration of the analyte in the sample (“J-“ indicates low bias “J+” indicates high bias)
- UJ: Indicates the analyte was not detected above the reporting limit and the reporting limit was approximate.
- R: The sample result was rejected due to serious deficiencies; the presence or absence of the analyte could not be confirmed.

Sample Information

The samples listed below were collected by AECOM on April 13, 2011 as part of the Garfield Avenue Soil RI sampling task at PPG Site 114, Jersey City, New Jersey.

Field ID	Laboratory ID	Matrix	Fraction
EF-B06-6.0	460-25301-1	Soil	Hexavalent Chromium
EF-B06-10.0	460-25301-2	Soil	Hexavalent Chromium
EF-B06-12.0	460-25301-3	Soil	Hexavalent Chromium
EF-B06-17.0	460-25301-4	Soil	Hexavalent Chromium
EF-B06-22.0	460-25301-5	Soil	Hexavalent Chromium
EF-B05-6.0	460-25301-6	Soil	Hexavalent Chromium
EF-B05-10.0	460-25301-7	Soil	Hexavalent Chromium
EF-B05-22.5	460-25301-10	Soil	Hexavalent Chromium
EF-B07-0.6	460-25301-11	Soil	Hexavalent Chromium
EF-B07-2.0	460-25301-12	Soil	Hexavalent Chromium
EF-B07-4.0	460-25301-14	Soil	Hexavalent Chromium
EF-B08-0.5	460-25301-15	Soil	Hexavalent Chromium
EF-B08-2.0	460-25301-16	Soil	Hexavalent Chromium
EF-B08-4.0	460-25301-18	Soil	Hexavalent Chromium
EB041311 (field blank)	460-25301-19	Aqueous	Hexavalent Chromium

The samples were collected following the procedures detailed in the NJDEP - Approved Remedial Investigation Work Plan – Soil Non-Residential Chromate Chemical Production Waste Sites 114, 132, 133, 135, 137, 143, and 186 (March 2011).

General Comments

The data package was complete. Quality control (QC) issues identified during validation are discussed below. Refer to the Soil Target Analyte Summary Hit List for a listing of all detected results, qualified results, and associated qualifications, where applicable.

Matrix Spike Results

Soil sample EF-B05-22.5 was selected for soluble and insoluble matrix spike analysis. The soluble and insoluble matrix spike recoveries were with quality control criteria of 75-125%; therefore, no qualifications were required.

Sample Reporting Limits

Sample EF-B05-6.0 was qualified "J", as estimated by the laboratory. The reported result was less than the reporting limit (RL), but greater than or equal to the method detection limit (MDL) and; therefore, is an approximate value.

Data Quality and Recommendations

In general, these data appear to be valid as reported by the laboratory and may be used for decision making purposes. No data were rejected. Qualified results were discussed in Attachments A and B below.

Attachments

Attachment A Target Analyte Summary Hitlist(s)

Attachment B Data Validation Report Form

Attachment A

Target Analyte Summary Hitlist(s)

Soil Target Analyte Summary Hit List

Site Name PPG GAEF Site 114, Jersey City, NJ
Sampling Date April 14, 2011
Lab Name/ID TestAmerica, Edison, NJ
SDG No 460-25301
Sample Matrix Soil
Trip Blank ID NA
Field Blank ID EB041311

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
EF-B05-6.0	460-25301-6	CHROMIUM (HEXAVALENT)	U	0.66	0.66	2.5	qualify	13
EF-B06-12.0	460-25301-3	CHROMIUM (HEXAVALENT)	U	32.4	32.4	2.3		
EF-B06-17.0	460-25301-4	CHROMIUM (HEXAVALENT)	U	44.8	44.8	2.3		
EF-B06-22.0	460-25301-5	CHROMIUM (HEXAVALENT)	U	98.8	98.8	12.0		

Note: The "U" under Method Blank column indicates a nondetect result.
 The "U" under the Laboratory Sample Result and Validation Sample Result columns indicate a nondetect result at the RL.

NJDEP Validation Footnote

13. The reported analyte was qualified because the result was greater than the MDL but below the RL.

Attachment B

Data Validation Report Form

Client Name: PPG Industries	Project Number: 60154801-0007
Site Location: PPG-GAEF	Project Manager: Robert Cataldo
Laboratory: TestAmerica, New Jersey	Limited or <u>Full Validation</u> (circle one)
Laboratory Job No: 460-25301	Date Checked: 5/13/2011
Validator: Justin Webster	Peer: Lisa Krowitz

ITEM	YES	NO	N/A	COMMENTS
Sample results included?	x			1 Aqs TBs and 14 Soils
Reporting Limits met project requirements?	x			Soils - 2.1 mg/kg to 12.0 mg/kg
Field I.D. included?	x			
Laboratory I.D. included?	x			
Sample matrix included?	x			
Sample receipt temperature 2-6°C?	x			1.2°C, no actions taken
Signed COCs included?	x			
Date of sample collection included?	x			4/13/11
Date of sample digestion included?	x			Soil extraction on 4/20/11
Holding time to digestion met criteria? Soils -30 days from collection to digestion.	x			See below
Date of analysis included?	x			Aqs 4/14/11 and Soils 4/22/11
Holding time to analysis met criteria? Soils -168 hours from digestion to analysis. Aqueous – 24 hours from collection to analysis.	x			See below
Method reference included?	x			3060A/7196A
Laboratory Case Narrative included?	x			
Definitions: MDL – Method Detection Limit; %R – Percent Recovery; RL – Reporting Limit; RPD – Relative Percent Difference; RSD – Relative Standard Deviation :Corr – Correlation Coefficient.				
Comments				
Field Duplicates: Not applicable for this SDG				

Sample dilutions: EF-B06-22.0 = 5x

ITEM	YES	NO	N/A	COMMENTS
Initial Calibration Documentation Included in Lab Package?	x			Cal source (soils WThcrIM00022) (aqs WThcrIM2-00022)
1. Blank plus 4 standards (7196A) or blank plus 3 standards (7199), 2. Correlation coefficient of ≥ 0.995 (7196A) or ≥ 0.999 (7199). 3. Calibrate daily or each time instrument is set up.	x			1. Each analysis 1 blank and 5 cal STDs 2. All analysis meet CC 3. yes
Calibration Check Standard (CCS) for 7196A and Quality Control Sample (QCS) for 7199 Included in Lab Package?	x			Check source (soils WThcrIM3-00011) (aqs WThcrIM4-00024)
1. %R criteria met? (90 - 110%). 2. Correct frequency of once every 10 samples 3. CCS and QCS from independent source and at mid level of calibration curve.	x			1. All met %R 2. Analyzed every 10 samples 3. Yes
Calibration Blanks	x			Aqs – 460-70519/1 and Soil 460-71477/1
1. Analyzed prior to initial calibration standards and after each CCS/QCS? 2. Absolute value should not exceed MDL.	x			1. Yes 2. Yes
Method Blank and Field Blanks Included in Lab Package?	x			Field blank included with this SDG EB-041311
1. Method blank analyzed with each preparation batch? 2. Absolute value should not exceed MDL.	x			1. Yes, aqs – 460-70519/9 and soils – 71173/1-A 2. Yes
Eh and pH data .	x			
Eh and pH data was included and plotted for all samples?	x			All samples indicate reducing conditions except for sample 460-25301-10 which was oxidizing.
Soluble Matrix Spike Data Included in Lab Package?	x			460-25301-10 (EF-B05-22.5)
1. %R criteria met? (75-125%R). 2. Was the spike concentration 40 mg/Kg? 3. Was a sample spiked at the frequency of 1/batch or 20 samples?	x	X*		1. Yes, 78% 2. No, 45.1 mg/kg 3. yes
Insoluble Matrix Spike Data Included in Lab Package?	x			460-25301-10 (EF-B05-22.5)
1. %R criteria met? (75-125%R). 2. Was the spike concentration 400 to 800 mg/Kg? 3. Was a sample spiked at the frequency of 1/batch or 20 samples?	x			1. Yes, 86% 2. Yes, 798 mg/kg 3. Yes
Post Digestion Spike	x			460-25301-10 (EF-B05-22.5)
1. %R criteria met? (85-115%R). 2. Was the spike concentration 40 mg/Kg or twice the sample concentration? 3. Was a sample spiked at the frequency of 1/batch or 20 samples?	x			1. Yes, 105% 2. Yes, 45.1 mg/kg 3. Yes
Sample Duplicate Data Included in Lab Package?	x			460-25301-10 (EF-B05-22.5)
1. RPD criteria met? (RPD < 20%) of both results are $\geq 4x$ RL or control limit of $\pm RL$ if both results are $< 4x$ RL. 2. Was a sample spiked at the frequency of 1/batch or 20 samples?	x			1. The RPD was NC due to nondetect results for both the original and duplicate samples.
Was a Laboratory Control Sample (LCS) Included in Lab Package?	x			
1. %R criteria met? (80-120%R). 2. Was an LCS analyzed at the frequency of 1/batch or 20 samples?	x			1. Yes 2. yes
Miscellaneous Items.				
1. For soils by 7196A, was the pH within a range of 7.0-8.0? 2. For soils by 7199, was the pH within a range of 9.0-9.5? 3. For aqueous by 7196A, was the pH with a range of 1.5-2.5? 4. For soils (3060A), was the digestion temperature 90-95°C for at least 60 minutes? 5. For 7199, was each sample injected twice and was the RPD ≤ 20 ?	x			1. Yes 2. NA 3. Yes 4. Yes 5. NA

Holding Times

Sample ID	Method	Days from Sampling to Prep	Days from Prep to Analysis	Days from Sampling to Analysis	Status	Status	Status
EF-B05-10.0	SW7196	7	2	9	OK @30 days	OK @7 days	OK @37 days
EF-B05-22.5	SW7196	7	2	9	OK @30 days	OK @7 days	OK @37 days
EF-B05-6.0	SW7196	7	2	9	OK @30 days	OK @7 days	OK @37 days
EF-B06-10.0	SW7196	7	2	9	OK @30 days	OK @7 days	OK @37 days
EF-B06-12.0	SW7196	7	2	9	OK @30 days	OK @7 days	OK @37 days
EF-B06-17.0	SW7196	7	2	9	OK @30 days	OK @7 days	OK @37 days
EF-B06-22.0	SW7196	7	2	9	OK @30 days	OK @7 days	OK @37 days
EF-B06-6.0	SW7196	7	2	9	OK @30 days	OK @7 days	OK @37 days
EF-B07-0.6	SW7196	7	2	9	OK @30 days	OK @7 days	OK @37 days
EF-B07-2.0	SW7196	7	2	9	OK @30 days	OK @7 days	OK @37 days
EF-B07-4.0	SW7196	7	2	9	OK @30 days	OK @7 days	OK @37 days
EF-B08-0.5	SW7196	7	2	9	OK @30 days	OK @7 days	OK @37 days
EF-B08-2.0	SW7196	7	2	9	OK @30 days	OK @7 days	OK @37 days
EF-B08-4.0	SW7196	7	2	9	OK @30 days	OK @7 days	OK @37 days
EB-041311	SW7196			1			OK @1 days

SDG#: 460-25301

Cr+6 ICAL -04/22/11
Soils
(p. 1919 of data pkg)

x - concentration	y - response
0	0
50	0.043
100	0.087
500	0.398
750	0.601
1250	0.993

(p. 1919 of data pkg)

AECOM Calculated Intercept	-4.5307	OK	Reported intercept	-4.5310
AECOM Slope	1262	OK	Reported Slope	1262
AECOM Calculated r	0.99997	OK	Reported r	1.00000

EF-B05-22.5 (460-25301-10)

p. 1928 of data pkg

Background reading	0.001
Total absorbance	0.007
Total absorbance - background	0.006
Instrument Response (µg/L)	3.039
Sample weight (g)	2.5
Final Volume (mL)	100
Percent solids	0.888
Dilution Factor	1

AECOM Calculated Result (mg/Kg)	0.1	OK sample ND	Reported Result (mg/Kg)	2.3 U
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LCS calculation

LCSS 460-711173/2-A pg. 1928

LCS Soluble Instrument Response	0.475
Instrument Concentration (ug/L)	594.745
Sample weight	2.5
Percent solids	1
Dilution Factor	1

AECOM Calculated LCS Result (mg/Kg)	23.79	OK rounding	Reported Result (mg/Kg)	23.8
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%R = Found/True*100

True Value (mg/kg)	25.4
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AECOM Calculated %R	93.7	OK rounding	Reported %R	94
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MS calculation

p. 1928 460-25301-10 MSS (EF-B05-22.5)

MS Insoluble Instrument Response	0.621
Instrument Concentration (ug/L)	778.943
Sample weight (g)	2.5
Percent solids	0.888
Dilution Factor	1

AECOM Calculated MS Result (mg/Kg)	35.09	OK rounding	Reported Result (mg/Kg)	35.11
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%R = Found/True*100

pg. 1863

True Value (mg/kg)	45.1
Native concentration (g)	0

%R	77.8	OK rounding	Reported %R	78
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Percent Solids

pg. 1932 EF-B05-22.5 (460-25301-10)

Empty dish weight=	0.96
Wet weight=	7.28
Dry weight=	6.57

AECOM%solids =	88.8	OK	TestAmerica reported %solids=	88.8
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EF-B05-22.5 (460-25301-10)

pg. 1928

Low Standard	50
Initial weight (g)	2.5
Final volume (mL)	100
Percent solids	0.89
Dilution Factor	1.00

Reporting Limit	2.3	OK	Reported RL (mg/Kg)=	2.3
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EF-B06-6.0 (460-25301-1)

p. 1928 of data pkg

Background reading	0.004
Total absorbance	0.005
Total absorbance - background	0.001
Instrument Response (µg/L)	-3.269
Sample weight (g)	2.56
Final Volume (mL)	100
Percent solids	0.795
Dilution Factor	1

AECOM Calculated Result (mg/Kg)	-0.2	OK sample ND	Reported Result (mg/Kg)	2.5 U
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EF-B06-10.0 (460-25301-2)

p. 1928 of data pkg

Background reading	0.001
Total absorbance	0.004
Total absorbance - background	0.003
Instrument Response (µg/L)	-0.746
Sample weight (g)	2.5
Final Volume (mL)	100
Percent solids	0.829
Dilution Factor	1

AECOM Calculated Result (mg/Kg)	0.0	OK sample ND	Reported Result (mg/Kg)	2.4 U
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EF-B06-12.0 (460-25301-3)

p. 1928 of data pkg

Background reading	0
Total absorbance	0.563
Total absorbance - background	0.563
Instrument Response (µg/L)	705.768
Sample weight (g)	2.53
Final Volume (mL)	100
Percent solids	0.86
Dilution Factor	1

AECOM Calculated Result (mg/Kg)	32.4		Reported Result (mg/Kg)	32.4
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EF-B06-17.0 (460-25301-4)

p. 1928 of data pkg

Background reading	0
Total absorbance	0.776
Total absorbance - background	0.776
Instrument Response (µg/L)	974.496
Sample weight (g)	2.5
Final Volume (mL)	100
Percent solids	0.87
Dilution Factor	1

AECOM Calculated Result (mg/Kg)	44.8		Reported Result (mg/Kg)	44.8
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EF-B06-22.0 (460-25301-5)	p. 1929 of data pkg		
Background reading	0		
Total absorbance	0.331		
Total absorbance - background	0.331		
Instrument Response (µg/L)	413.070		
Sample weight (g)	2.53		
Final Volume (mL)	100		
Percent solids	0.827		
Dilution Factor	5		
AECOM Calculated Result (mg/Kg)	98.7	Reported Result (mg/Kg)	98.8
EF-B05-6.0 (460-25301-6)	p. 1928 of data pkg		
Background reading	0.002		
Total absorbance	0.016		
Total absorbance - background	0.014		
Instrument Response (µg/L)	13.132		
Sample weight (g)	2.49		
Final Volume (mL)	100		
Percent solids	0.804		
Dilution Factor	1		
AECOM Calculated Result (mg/Kg)	0.66	Reported Result (mg/Kg)	0.66 J
EF-B05-10.0 (460-25301-7)	p. 1928 of data pkg		
Background reading	0.023		
Total absorbance	0.02		
Total absorbance - background	-0.003		
Instrument Response (µg/L)	-8.316		
Sample weight (g)	2.52		
Final Volume (mL)	100		
Percent solids	0.69		
Dilution Factor	1		
AECOM Calculated Result (mg/Kg)	-0.5	Reported Result (mg/Kg)	2.9 U
EF-B07-0.6 (460-25301-11)	p. 1928 of data pkg		
Background reading	0		
Total absorbance	0.007		
Total absorbance - background	0.007		
Instrument Response (µg/L)	4.301		
Sample weight (g)	2.52		
Final Volume (mL)	100		
Percent solids	0.952		
Dilution Factor	1		
AECOM Calculated Result (mg/Kg)	0.2	Reported Result (mg/Kg)	2.1 U
EF-B07-2.0 (460-25301-12)	p. 1928 of data pkg		
Background reading	0.009		
Total absorbance	0.01		
Total absorbance - background	0.001		
Instrument Response (µg/L)	-3.269		
Sample weight (g)	2.49		
Final Volume (mL)	100		
Percent solids	0.771		
Dilution Factor	1		
AECOM Calculated Result (mg/Kg)	-0.2	Reported Result (mg/Kg)	2.6 U

EF-B07-4.0 (460-25301-14)	p. 1928 of data pkg		
Background reading	0		
Total absorbance	0.003		
Total absorbance - background	0.003		
Instrument Response (µg/L)	-0.746		
Sample weight (g)	2.49		
Final Volume (mL)	100		
Percent solids	0.901		
Dilution Factor	1		
AECOM Calculated Result (mg/Kg)	0.0	Reported Result (mg/Kg)	2.2 U
EF-B08-0.5 (460-25301-15)	p. 1929 of data pkg		
Background reading	0.001		
Total absorbance	0.006		
Total absorbance - background	0.005		
Instrument Response (µg/L)	1.777		
Sample weight (g)	2.49		
Final Volume (mL)	100		
Percent solids	0.752		
Dilution Factor	1		
AECOM Calculated Result (mg/Kg)	0.1	Reported Result (mg/Kg)	2.7 U
EF-B08-2.0 (460-25301-16)	p. 1929 of data pkg		
Background reading	0.349		
Total absorbance	0.3		
Total absorbance - background	-0.049		
Instrument Response (µg/L)	-66.351		
Sample weight (g)	2.49		
Final Volume (mL)	100		
Percent solids	0.732		
Dilution Factor	1		
AECOM Calculated Result (mg/Kg)	-3.6	Reported Result (mg/Kg)	2.7 U
EF-B08-4.0 (460-25301-18)	p. 1929 of data pkg		
Background reading	0.017		
Total absorbance	0.015		
Total absorbance - background	-0.002		
Instrument Response (µg/L)	-7.054		
Sample weight (g)	2.46		
Final Volume (mL)	100		
Percent solids	0.689		
Dilution Factor	1		
AECOM Calculated Result (mg/Kg)	-0.4	Reported Result (mg/Kg)	3.0 U

Data Validation Report

Project	PPG – GA EF	Page	1
Laboratory	Test America, NJ		
Laboratory Job No.	460-25190		
Analysis/Method	TAL Metals SW-846 3050B/6010B/7471A		
Validation Level	QC Summary Review (Limited)		
Site Location/Address	Garfield Avenue, Soil RI, Site 114, Jersey City, NJ		
AECOM Project Number	60154801.0007		
Prepared by Sharon McKechnie/AECOM	Completed on May 16, 2011		
Reviewed by Lisa Krowitz/AECOM	File Name 2011-05-16 TAL Metals DV Report 460-25190 F.docx		

Introduction

The results of quality control data analyzed with site samples were used to assess the overall reliability of the data. The following qualifiers were used to identify data quality issues:

- U: Indicates the analyte was not detected in the sample above the sample reporting limit
- J: Indicates the result was an estimated value; the associated numerical value was an approximate concentration of the analyte in the sample
- UJ: Indicates the analyte was not detected above the reporting limit and the reporting limit was approximate.
- R: The sample result was rejected due to serious deficiencies; the presence or absence of the analyte could not be confirmed.

Sample Information

The samples listed below were collected by AECOM on April 11, 2011 as part of the Garfield Avenue Soil RI sampling task at PPG Site 114, Jersey City, New Jersey.

Field ID	Laboratory ID	Matrix	Fraction
EF-B03-2.5	460-25190-3	Soil	TAL Metals
EF-B04-2.5	460-25190-7	Soil	TAL Metals
EF-B05-2.5	460-25190-11	Soil	TAL Metals
EB041111(Equipment blank collected 4/11/11)	460-25190-12	Aqueous	TAL Metals

Soil samples were collected following the procedures detailed in the Approved Remedial Investigation Work Plan-Soil Non-Residential Chromate Production Waste Sites 114, 132, 133, 135, 137, 143, and 186 (March 2011).

General Comments

The data package was complete. Quality control (QC) issues identified during validation are discussed below. Selected results were qualified as estimated for certain QC nonconformances. Refer to the Target Analyte Summary Hit List for a listing of all detected results, qualified results, and associated qualifications, where applicable.

Matrix Spike Results

Some matrix spike/matrix spike duplicates (MS/MSD) for mercury, aqueous metals, and solid metals batches were performed on non-site specific samples or samples from other SDGs. No actions were taken for MS and/or MSD nonconformances from non-site specific samples due to potential differences in the sample matrices. Refer to Attachments A and B for the MS/MSD nonconformances and qualified results.

Sample Reporting Limits

Selected soil and/or aqueous reporting limits exceeded the NJDEP Default Impact to GW Soil Screening Levels and/or NJDEP Specific GW Quality Criteria, respectively: The non-detect results with reporting limits that exceeded the NJDEP standards are presented in the attached Data Validation Report Form.

Data Quality and Recommendations

In general, these data appear to be valid and may be used for decision-making purposes. With the exception of the qualified results, all TAL metals results were accepted as reported by the laboratory.

Attachments

Attachment A Target Analyte Summary Hitlist(s)

Attachment B Data Validation Report Form

Attachment A

Target Analyte Summary Hitlist(s)

Soil Target Analyte Summary Hit List

Site Name Garfield Avenue Soil RI, Site 114, Jersey City, NJ
Sampling Date April 11, 2011
Lab Name/ID Test America, Edison, NJ
SDG No 460-25190
Sample Matrix Soil
Trip Blank ID NA
Field Blank ID EB041111

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
EF-B03-2.5	460-25190-3	ALUMINUM	U	8590	8590	42.8		
EF-B03-2.5	460-25190-3	ANTIMONY	U	U	U	2.1	Qualify	15
EF-B03-2.5	460-25190-3	BARIUM	U	51.0	51.0	42.8		
EF-B03-2.5	460-25190-3	BERYLLIUM	U	0.42	0.42	0.43		
EF-B03-2.5	460-25190-3	CADMIUM	U	0.36	0.36	1.1		
EF-B03-2.5	460-25190-3	CALCIUM METAL	U	3400	3400	1070		
EF-B03-2.5	460-25190-3	CHROMIUM	U	35.9	35.9	2.1		
EF-B03-2.5	460-25190-3	COBALT	U	7.0	7.0	10.7		
EF-B03-2.5	460-25190-3	COPPER	U	34.9	34.9	5.3		
EF-B03-2.5	460-25190-3	IRON	U	14300	14300	32.1		
EF-B03-2.5	460-25190-3	MAGNESIUM	U	2770	2770	1070		
EF-B03-2.5	460-25190-3	MANGANESE	U	289	289	3.2		
EF-B03-2.5	460-25190-3	NICKEL	U	19.8	19.8	8.6		
EF-B03-2.5	460-25190-3	POTASSIUM	U	1160	1160	1070		
EF-B03-2.5	460-25190-3	SILVER	U	U	U	2.1	Qualify	15
EF-B03-2.5	460-25190-3	SODIUM	U	217	217	1070		

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
EF-B03-2.5	460-25190-3	VANADIUM	U	23.4	23.4	10.7		
EF-B03-2.5	460-25190-3	ZINC	U	394	394	6.4		
EF-B03-2.5	460-25190-3	ARSENIC	U	9.4	9.4	1.1		
EF-B03-2.5	460-25190-3	LEAD	U	272	272	1.1		
EF-B03-2.5	460-25190-3	SELENIUM	U	1.1	1.1	2.1		
EF-B04-2.5	460-25190-7	ALUMINUM	U	3230	3230	44.1		
EF-B04-2.5	460-25190-7	ANTIMONY	U	U	U	2.2	Qualify	15
EF-B04-2.5	460-25190-7	ARSENIC	U	3.2	3.2	1.1		
EF-B04-2.5	460-25190-7	BARIUM	U	25.0	25.0	44.1		
EF-B04-2.5	460-25190-7	BERYLLIUM	U	0.32	0.32	0.44		
EF-B04-2.5	460-25190-7	CALCIUM METAL	U	7780	7780	1100		
EF-B04-2.5	460-25190-7	CHROMIUM	U	14.2	14.2	2.2		
EF-B04-2.5	460-25190-7	COBALT	U	4.1	4.1	11.0		
EF-B04-2.5	460-25190-7	COPPER	U	7.0	7.0	5.5		
EF-B04-2.5	460-25190-7	IRON	U	7830	7830	33.1		
EF-B04-2.5	460-25190-7	LEAD	U	12.0	12.0	1.1		
EF-B04-2.5	460-25190-7	MAGNESIUM	U	2950	2950	1100		
EF-B04-2.5	460-25190-7	MANGANESE	U	226	226	3.3		
EF-B04-2.5	460-25190-7	NICKEL	U	7.4	7.4	8.8		
EF-B04-2.5	460-25190-7	POTASSIUM	U	1030	1030	1100		
EF-B04-2.5	460-25190-7	SILVER	U	U	U	2.2	Qualify	15
EF-B04-2.5	460-25190-7	SODIUM	U	132	132	1100		
EF-B04-2.5	460-25190-7	VANADIUM	U	17.7	17.7	11.0		
EF-B04-2.5	460-25190-7	ZINC	U	44.3	44.3	6.6		
EF-B05-2.5	460-25190-	ALUMINUM	U	1730	1730	46.3		
EF-B05-2.5	460-25190-	ANTIMONY	U	U	U	2.3	Qualify	15

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
EF-B05-2.5	460-25190-	ARSENIC	U	6.1	6.1	1.2		
EF-B05-2.5	460-25190-	BARIUM	U	39.7	39.7	46.3		
EF-B05-2.5	460-25190-	BERYLLIUM	U	0.23	0.23	0.46		
EF-B05-2.5	460-25190-	CADMIUM	U	0.81	0.81	1.2		
EF-B05-2.5	460-25190-	CALCIUM METAL	U	2340	2340	1160		
EF-B05-2.5	460-25190-	CHROMIUM	U	759	759	2.3		
EF-B05-2.5	460-25190-	COBALT	U	6.5	6.5	11.6		
EF-B05-2.5	460-25190-	COPPER	U	50.5	50.5	5.8		
EF-B05-2.5	460-25190-	IRON	U	7880	7880	34.7		
EF-B05-2.5	460-25190-	LEAD	U	86.3	86.3	1.2		
EF-B05-2.5	460-25190-	MAGNESIUM	U	503	503	1160		
EF-B05-2.5	460-25190-	MANGANESE	U	257	257	3.5		
EF-B05-2.5	460-25190-	NICKEL	U	19.4	19.4	9.3		
EF-B05-2.5	460-25190-	POTASSIUM	U	110	110	1160		
EF-B05-2.5	460-25190-	SELENIUM	U	1.1	1.1	2.3		
EF-B05-2.5	460-25190-	SILVER	U	U	U	2.3	Qualify	15
EF-B05-2.5	460-25190-	SODIUM	U	90.2	90.2	1160		
EF-B05-2.5	460-25190-	VANADIUM	U	11.6	11.6	11.6		
EF-B05-2.5	460-25190-	ZINC	U	177	177	6.9		
EF-B03-2.5	460-25190-3	MERCURY	U	0.21	0.21	0.033		
EF-B05-2.5	460-25190-	MERCURY	U	0.22	0.22	0.038		

Note: The "U" under Method Blank column indicates a nondetect result.
The "U" under the Laboratory Sample Result and Validation Sample Result columns indicate a nondetect result at the RL.

NJDEP Hitlist Footnotes:

- 1) The value reported is less than or equal to 3x the value in the method blank. It is the policy of NJDEP-DPFSR to negate the reported value due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
- 2) The value reported is greater than three (3) but less than ten (10) times the value in the method blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to the method blank contamination. The "B" qualifier alerts the end-user to the presence of this analyte in the method blank.
- 3) The value reported is less than or equal to 3x the value in the trip/field blank. It is the policy of NJDEP-DPFSR to negate the reported value as due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
- 4.) The value reported is greater than 3x but less than ten (10) the value in the trip/field blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to trip/field blank contamination.
- 5.) The concentration reported by the laboratory is incorrectly calculated.
- 6.) The laboratory failed to report the presence of the analyte in the sample.
- 7.) The reported metal value was qualified because the Calibration Verification Standard was not within the recovery range (90-110 percent).
- 8) In the MS/MSD Sample Analysis, this analyte fell outside the control limits of 20% RPD. Therefore, the result was qualified.
- 9.) This analyte was qualified because the laboratory performed the MS/MSD Analysis on a field blank.
- 10) The reported analyte was qualified because the associated Calibration Blank result was greater than the MDL.
- 11) The reported value was qualified because serial dilution analysis was not within QC limit of 10% D.
- 12) This analyte is rejected because the laboratory exceeded the holding time for digestion and analysis.

- 13) The laboratory subtracted the method blank from the sample result. The reviewer's calculation has added the method blank result to the reported concentration.
- 14) The photocopy submitted is illegible. Therefore, the QA reviewer cannot read the laboratory's reported concentration result.
- 15) The reported or nondetected value was qualified because the MS/MSD spike recovery was less than 75 percent.
- 16) The reported value was qualified because the MS/MSD spike recovery was greater than 125 percent.
- 17) The non-detected value was qualified (UJ) because the MS/MSD spike recovery was less than 75 percent. The possibility of a false negative exists.
- 18) In the field duplicate analysis this analyte fell outside of the control limits of 35% RPD. Therefore, the result was qualified.
- 19) The laboratory failed to analyze an MS/MSD for the particular matrix. Therefore, the result was rejected.
- 20) The reported or nondetect value was qualified with an uncertain bias because the MS %R and MSD %R had opposing biases.
- 21) In the soil laboratory duplicate analysis this analyte fell outside of the control limits of 35% RPD. Therefore, the result was qualified.
- 22) The reported or nondetected value was rejected because the MS/MSD spike recovery was less than 10 percent.
- 23) The reported analyte was qualified (J) because the associated sample result was greater than the MDL but less than the RL.
- 24) The reported or nondetect value was qualified (J/UJ) because the solid sample had a percent solids of less than 30%.

Attachment B

Data Validation Report Form

Client Name: PPG Industries	Project Number: 60154801-0007
Site Location: PPG- Garfield Avenue Soil RI, Site 114, Jersey City, NJ	Project Manager: Robert Cataldo
Laboratory: Test America, New Jersey	Limited or Full Validation (circle one)
Laboratory Job No: 460-25190	Date Checked: 5/16/2011
Validator: Sharon McKechnie	Peer Review: Lisa Krowitz

ITEM	YES	NO	N/A	COMMENTS
Sample results included?	X			
Reporting Limits met project requirements?	X	X*		*See attached table "Dilutions and Reporting Limits". Elevated reporting limits due to sample dilutions.
Field I.D. included?	X			
Laboratory I.D. included?	X			
Sample matrix included?	X			
Sample receipt temperature 2-6°C?	X			4.4°C
Signed COCs included?	X			
Date of sample collection included?	X			Collected 4/11/2011
Date of sample digestion included?	X			
Date of analysis included?	X			
Holding time met QC criteria? Metals -180 days from sample collection Mercury – 28 days from sample collection If HT exceeded by - ≤ 10 days, J/UJ all results - > 10 days, R all results	X			See attached table "Hold Times"
Method reference included?	X			
Laboratory Case Narrative included?	X			
Sample Dilutions	X			See attached table "Dilutions and Reporting Limits"
Field Duplicates ("x" appended to sample ID) (RPD calculation on separate sheet)		X		None this SDG
Definitions: MDL – Method Detection Limit; %R – Percent Recovery; RL – Reporting Limit; RPD – Relative Percent Difference; RSD – Relative Standard Deviation :Corr – Correlation Coefficient.				
Comments				
Selected metals in all soil samples were reanalyzed within hold time				

QA/QC CHECKLIST FOR TAL METALS ANALYSIS

ITEM	YES	NO	N/A	COMMENTS
Initial Calibration Documentation Included in Lab Package?			X	Not reviewed for limited validation
1. Calibrate daily or each time instrument is set up?. If no, reject (R) data. 2. ICP (6010) - Blank plus 1 standard? If no, reject (R) data. 3. Hg (7470/7471) – Blank plus 5 standards? If no, reject (R) data.				
Initial Calibration Verification Standard (ICV) for ICP (6010) and Initial Calibration Check Standard (ICCS) for Hg (7470/7471) Included in Lab Package?			X	Not reviewed for limited validation
1. Analyzed immediately after initial calibration? If no, reject (R) data. 2. %R criteria met? (90 - 110%). If no, J positive results for affected analyte(s) if %R between 80-89% and 111-120% and indicate bias UJ non-detect results for affected analyte(s) if %R between 80-89% R all data for affected analyte(s) if <80% or >120% 3. Spot check ICV/ICCS results for several analytes				
Continuing Calibration Verification Standard (CCV) for ICP (6010) and Calibration Check Standard (CCS) for Hg (7470/7471) included in Lab Package?			X	Not reviewed for limited validation
1. Analyzed immediately after each ICV/ICC/CB and after every 10 samples? If no, reject (R) data. 2. CCS and CCV from independent source and at mid level of calibration curve. If no, reject (R) data. 3. %R criteria met? (90 - 110%) If no, J positive results for affected analyte(s) if %R between 80-89% and 111-120% and indicate bias UJ non-detect results for affected analyte(s) if %R between 80-89% R all data for affected analyte(s) if %R <80% or >120% 4. Spot check CCV/CCS results for several analytes				
Low Calibration Standard (CRI) included in Lab Package?			X	Not reviewed for limited validation
1. %R criteria met? - 50 - 150% for Co, Mn, Zn by ICP-MS, PB, TI by 6010) - 70-130% all others If no, refer to ILM05.4 NJ SOP 5.A.2 for actions.				
Calibration Blanks			X	Not reviewed for limited validation
1. Analyzed immediately after daily calibration and after each ICV/ICC/CCV/CCS, and after every 10 samples? If no, reject (R) data. 2. Absolute value $\leq 3 \times \text{IDL}$? If no, - if sample result $\leq 10 \times \text{CB}$ result, qualify affected analyte(s) in associated samples with CB - if sample result $> 10 \times \text{CB}$ result, no qualification				
Method Blank included in Lab Package?	X			
1. Method blank analyzed with each preparation batch or every SDG, or 1/20 samples? If no, reject (R) data, except no aqueous MB required for FB/EB if only soil samples were analyzed. 2. Method blank analyzed 1/20 samples? If - MB 1/25, J sample results from 21-25 - MB > 1/25, R sample results after 25 th sample 3. MB result nondetect? If no, - Sample result $\leq 3 \times \text{MB}$, negate UB - Sample result $< 3 \times \text{MB}$, but $\leq 10 \times \text{MB}$, JB - Sample result $> 10 \times \text{MB}$, no qualification 4. Negative MB result reported? If yes, -Positive sample result $\leq 10 \times \text{MB}$, qualify estimated, biased low (J) -Non-detect sample result, qualify UJ, may be false non-detect				1. Yes 2. 1/ batch 3. Yes 4.No
Field Blanks/Equipment Blanks included in Lab Package?	X			Blanks apply to samples collected during same week as blank
1, FB/EB result nondetect? If no, - Sample result $\leq 3 \times \text{FB/EB}$, negate U - Sample result $< 3 \times \text{FB/EB}$, but $\leq 10 \times \text{FB/EB}$, J - Sample result $> 10 \times \text{FB/EB}$, no qualification				EB041111, all ND

ITEM	YES	NO	N/A	COMMENTS
ICP Interference Check Sample (ICS) included in Lab Package?			X	Not reviewed for limited validation
1. Analyzed at beginning of analytical run? If no, reject (R) data. 2. %R criteria met? (80-120%) If no, %R > 120%, no qualification if sample result non-detect %R between 121-150%, J positive results, biased high %R between 50-79%, J/UJ results, biased low %R <50% or >150%, reject (R) result 3. Spot check accuracy of %Rs				
Matrix Spike/Matrix Spike Duplicate Data Included in Lab Package?	X			MSD also used as laboratory duplicate QC
1. MS/MSD %R (75-125%R) and RPD (\pm 20%) criteria met? - %R >125% J positive results for affected analyte(s) for all samples in the same batch/SDG, accept NDs. - %R <75% J/UJ for affected analyte(s) for all samples in the same batch/SDG - RPD outside \pm 20% J positive results for affected analyte(s) for all samples in the same batch/SDG, accept NDs. 2. Was a sample spiked at the frequency of 1/batch or 20 samples? 3. Was the MS performed on a site sample? 4. Was the MS performed on a FB/EB or TB? If yes, J all sample data.		X		1. Some MS %R nonconformances. Refer to MS/MSD Summary table. 2. Frequency OK 3. Non site samples spiked for all mercury. One metals site sample spiked (solid). 4. NA
Serial Dilution			X	Not reviewed for limited validation
1. %D (\leq 10%R) criteria met? - If analyte concentration > 25xIDL (7000) or > 10x IDL (6010) and %D > 10% J positive results for affected analyte(s) for all samples in the same batch/SDG, accept NDs. 2. Was the frequency 1/batch or 20 samples? 3. Was a site sample used? 4. Was a FB/EB or TB used? If yes, J all sample data. 5. Spot check accuracy of %Ds				
Post Digestion Spike			X	Not reviewed for limited validation
1. %R criteria met? (75-125%R). - %R >125% J positive results for affected analyte(s) for all samples in the same batch/SDG, accept NDs. - %R <75% J/UJ affected analyte(s) for all samples in the same batch/SDG. 2. Was the spike performed on a FB/EB or TB? If yes, J all sample data? 3. Was a sample spiked at the frequency of 1/batch or 20 samples?				
Laboratory Control Sample Data Included in Lab Package?	X			
1. LCS %R (80-120%R) criteria met? If no, J/UJ all affected analyte(s) for all samples in the same batch/SDG. data. 2. Was a sample spiked at the frequency of 1/batch or 20 samples? If no, J/UJ affected analyte(s) for all sample in the same batch/SDG.				1. Yes 2. 1/batch
Laboratory Duplicate Data Included in Lab Package?	X			
<p><u>Aqueous</u></p> <p>If RPD is >20% but <100% and sample and field duplicate results are >5x the QL, estimate (J) results > the QL. If RPD is >100%, reject (R) results \geq the QL. If sample and/or duplicate is <5x the QL and absolute difference is > the QL, estimate (J) positive results <5x the QL and nondetects (UJ). If absolute difference is > 2x the QL, reject (R) non detects and positive results <5x the QL.</p> <p><u>SOIL:</u></p> <p>If RPD is >35% but <120% and sample and field duplicate results are >5x the QL, estimate (J) results > the QL. If RPD is > 120%, reject (R) results > the QL. If sample and/or duplicate is <5x the QL and absolute difference is >2x the QL, estimate (J) positive results <5x QL and nondetects (UJ). If absolute difference is >4x the QL, reject (R) non detects and positive results <5x QL.</p>				All criteria met

ITEM	YES	NO	N/A	COMMENTS
Field Duplicate Data Included in Lab Package?		X		
<p><u>Aqueous</u></p> <p>If RPD is >20% but <100% and sample and field duplicate results are >5x the QL, estimate (J) results > the QL. If RPD is >100%, reject (R) results ≥ the QL. If sample and/or duplicate is <5x the QL and absolute difference is > the QL, estimate (J) positive results <5x the QL and nondetects (UJ). If absolute difference is > 2x the QL, reject (R) non detects and positive results <5x the QL.</p> <p><u>SOIL:</u></p> <p>If RPD is >35% but <120% and sample and field duplicate results are >5x the QL, estimate (J) results > the QL. If RPD is > 120%, reject (R) results > the QL. If sample and/or duplicate is <5x the QL and absolute difference is >2x the QL, estimate (J) positive results <5x QL and nondetects (UJ). If absolute difference is >4x the QL, reject (R) non detects and positive results <5x QL.</p>				None this SDG

Hold Times

SampleID	Matrix	Analysis Method	Sample Date	Prep Date	Analysis Date	Sample To Prep	PrepTo Analysis	SampleTo Analysis	SA Status
EB041111	WQ	SW6010	4/11/2011 15:30	4/14/2011 11:05	4/19/2011 12:22	3	5	8	OK @ 180 days
EF-B03-2.5	SO	SW6010	4/11/2011 10:40	4/13/2011 7:25	4/20/2011 19:13	2	7	9	OK @ 180 days
EF-B03-2.5	SO	SW6010	4/11/2011 10:40	4/13/2011 7:25	4/21/2011 11:37	2	8	10	OK @ 180 days
EF-B04-2.5	SO	SW6010	4/11/2011 13:25	4/14/2011 7:20	4/18/2011 22:29	3	4	7	OK @ 180 days
EF-B05-2.5	SO	SW6010	4/11/2011 14:40	4/14/2011 7:20	4/18/2011 22:33	3	4	7	OK @ 180 days
EB041111	WQ	SW7470	4/11/2011 15:30	4/12/2011 10:13	4/12/2011 13:03	1	0	1	OK @ 28 days
EF-B03-2.5	SO	SW7471	4/11/2011 10:40	4/12/2011 10:22	4/12/2011 15:25	1	0	1	OK @ 28 days
EF-B04-2.5	SO	SW7471	4/11/2011 13:25	4/12/2011 10:22	4/12/2011 15:27	1	0	1	OK @ 28 days
EF-B05-2.5	SO	SW7471	4/11/2011 14:40	4/12/2011 10:22	4/12/2011 15:29	1	0	1	OK @ 28 days

REPORTING LIMITS AND DILUTIONS

Sample ID	Lab ID	Dilution Factor	Method	Analyte	Result	Detect Flag	Units	NJDEP Impact to GW Soil Screening level (mg/kg)	Flag
EF-B03-2.5	460-25190-3	4	SW6010	SILVER	2.1	N	mg/kg	1	RL exceeds
EF-B04-2.5	460-25190-7	4	SW6010	CADMIUM	1.1	N	mg/kg	1	RL exceeds
EF-B04-2.5	460-25190-7	4	SW6010	SILVER	2.2	N	mg/kg	1	RL exceeds
EF-B05-2.5	460-25190-11	4	SW6010	SILVER	2.3	N	mg/kg	1	RL exceeds

MS/MSD Summary (Spiked 460-25254-E-2-C)

METAL	Spiked SAMP RESULT	SAMP RESULT	SPIKE ADDED	%R	ACTION
Aluminum	6410	4800	218	739	spike added <4x samp result, will not apply
Antimony	30.22	2.2 U	54.6	55	J/UJ all samples in this SDG
Arsenic	179.7	3.3	218	81	OK
Barium	252.4	44.7	218	95	OK
Beryllium	5.22	0.46	5.46	87	OK
Cadmium	4.69	1.1 U	5.46	86	OK
Calcium	9390	6820	2180	118	OK
Chromium	38.96	21.2	21.8	81	OK
Cobalt	51.91	5.0 J	54.6	86	OK
Copper	30.92	7.7	27.3	85	OK
Iron	11070	10900	109	128	spike added <4x samp result, will not apply
Lead	57.98	8.3	54.6	91	OK
Magnesium	5962	4220	2180	80	OK
Manganese	306.2	258	54.6	88	OK
Nickel	56.98	9.6	54.6	87	OK
Potassium	3614	1090	2180	116	OK
Selenium	174.0	2.2 U	218	80	OK
Silver	3.86	2.2 U	5.46	71	J/UJ all samples in this SDG
Sodium	2047	120 J	2180	88	OK
Thallium	201.3	2.2 U	218	92	OK
Vanadium	68.03	19.1	54.6	90	OK
Zinc	157.8	106	54.6	95	OK

Data Validation Report

Project	PPG – GA EF	Page	1
Laboratory	Test America, NJ		
Laboratory Job No.:	460-25254		
Analysis/Method:	Hexavalent Chromium SW846 3060A/7196A (including pH and Eh)		
Validation Level:	Full		
Site Location/Address:	Garfield Avenue Soil RI, Site 114, Jersey City, NJ		
AECOM Project Number:	60158739-0007		
Prepared by: Justin Webster/AECOM	Completed on: May 19, 2011		
Reviewed by: Lisa Krowitz/AECOM	File Name: 2011-05-19 Hex Cr DV Report 460-25254-F.docx		

Introduction

The results of quality control data analyzed with site samples were used to assess the overall reliability of the data. The following qualifiers were used to identify data quality issues:

- U: Indicates the analyte was not detected in the sample above the sample reporting limit
- J: Indicates the result was an estimated value; the associated numerical value was an approximate concentration of the analyte in the sample (“J-“ indicates low bias “J+” indicates high bias)
- UJ: Indicates the analyte was not detected above the reporting limit and the reporting limit was approximate.
- R: The sample result was rejected due to serious deficiencies; the presence or absence of the analyte could not be confirmed.

Sample Information

The samples listed below were collected by AECOM on April 12, 2011 as part of the Garfield Avenue Soil RI sampling task at PPG Site 114, Jersey City, New Jersey.

Field ID	Laboratory ID	Matrix	Fraction
EF-B03-6.0	460-25254-1	Soil	Hexavalent Chromium
EF-B03-10.0	460-25254-3	Soil	Hexavalent Chromium
EF-B03-8.0	460-25254-4	Soil	Hexavalent Chromium
EF-B03-12.0	460-25254-5	Soil	Hexavalent Chromium
EF-B03-16.0	460-25254-6	Soil	Hexavalent Chromium
EF-B03-22.0	460-25254-7	Soil	Hexavalent Chromium
EF-B03-27.0	460-25254-8	Soil	Hexavalent Chromium
EF-B05-4.0	460-25254-9	Soil	Hexavalent Chromium
EF-B06-0.5	460-25254-10	Soil	Hexavalent Chromium
EF-B06-2.0	460-25254-11	Soil	Hexavalent Chromium
EF-B06-4.0	460-25254-13	Soil	Hexavalent Chromium
EB-041211 (field blank)	460-25254-14	Aqueous	Hexavalent Chromium

The samples were collected following the procedures detailed in the NJDEP - Approved Remedial Investigation Work Plan – Soil Non-Residential Chromate Chemical Production Waste Sites 114, 132, 133, 135, 137, 143, and 186 (March 2011).

General Comments

The data package was incomplete and missing the calibration curve for the hexavalent chromium soil analysis. TestAmerica resubmitted a revised data package on 5/17/2011, which contained the missing calibration curve. Quality control (QC) issues identified during validation are discussed below. Refer to the Soil Target Analyte Summary Hit List for a listing of all detected results, qualified results, and associated qualifications, where applicable.

Matrix Spike Results

Soil sample EF-B03-27.0 was selected for soluble and insoluble matrix spike analysis. The soluble and insoluble matrix spike recoveries were with quality control criteria of 75-125%; therefore, no qualifications were required.

Sample Reporting Limits

Samples EF-B03-6.0, EF-B03-12.0, EF-B06-4.0, and EF-B06-6.0 were qualified "J", as estimated by the laboratory. The reported results were less than the reporting limit (RL), but greater than or equal to the method detection limit (MDL) and; therefore, are approximate values.

Data Quality and Recommendations

In general, these data appear to be valid as reported by the laboratory and may be used for decision making purposes. No data were rejected. Qualified results were discussed in Attachments A and B below.

Attachments

Attachment A Target Analyte Summary Hitlist(s)

Attachment B Data Validation Report Form

Attachment A

Target Analyte Summary Hitlist(s)

Soil Target Analyte Summary Hit List

Site Name PPG GAEF Site 114, Jersey City, NJ
Sampling Date April 12, 2011
Lab Name/ID TestAmerica, Edison, NJ
SDG No 460-25254
Sample Matrix Soil
Trip Blank ID NA
Field Blank ID EB-041211

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
EF-B03-12.0	460-25254-5	CHROMIUM (HEXAVALENT)	U	2.1	2.1	2.3	qualify	13
EF-B03-22.0	460-25254-7	CHROMIUM (HEXAVALENT)	U	4.0	4.0	2.4		
EF-B03-6.0	460-25254-1	CHROMIUM (HEXAVALENT)	U	0.60	0.60	2.2	qualify	13
EF-B03-8.0	460-25254-4	CHROMIUM (HEXAVALENT)	U	5.0	5.0	2.1		
EF-B05-4.0	460-25254-9	CHROMIUM (HEXAVALENT)	U	8.4	8.4	2.7		
EF-B06-0.5	460-25254-10	CHROMIUM (HEXAVALENT)	U	1.4	1.4	2.2	qualify	13
EF-B06-4.0	460-25254-13	CHROMIUM (HEXAVALENT)	U	1.0	1.0	2.4	qualify	13

Note: The "U" under Method Blank column indicates a nondetect result.

The "U" under the Laboratory Sample Result and Validation Sample Result columns indicate a nondetect result at the RL.

NJDEP Validation Footnote

13. The reported analyte was qualified because the result was greater than the MDL but below the RL.

Attachment B

Data Validation Report Form

Client Name: PPG Industries	Project Number: 60154801-0007
Site Location: PPG-GAEF	Project Manager: Robert Cataldo
Laboratory: TestAmerica, New Jersey	Limited or <u>Full Validation</u> (circle one)
Laboratory Job No: 460-25254	Date Checked: 5/19/2011
Validator: Justin Webster	Peer: Lisa Krowitz

ITEM	YES	NO	N/A	COMMENTS
Sample results included?	x			1 Aqs TBs and 11 Soils
Reporting Limits met project requirements?	x			Ranging 2.1 mg/kg to 2.7 mg/kg
Field I.D. included?	x			
Laboratory I.D. included?	x			
Sample matrix included?	x			
Sample receipt temperature 2-6°C?	x			2.3°C
Signed COCs included?	x			
Date of sample collection included?	x			4/12/2011
Date of sample digestion included?	x			4/19/2011
Holding time to digestion met criteria? Soils -30 days from collection to digestion.	x			See table below "Holding Time"
Date of analysis included?	x			Aqs 4/13/2011 and Soils 4/21/2011
Holding time to analysis met criteria? Soils -168 hours from digestion to analysis. Aqueous – 24 hours from collection to analysis.	x			See table below "Holding Time"
Method reference included?	x			3060A/7196A
Laboratory Case Narrative included?	x			
Definitions: MDL – Method Detection Limit; %R – Percent Recovery; RL – Reporting Limit; RPD – Relative Percent Difference; RSD – Relative Standard Deviation :Corr – Correlation Coefficient.				
Comments				
Field Duplicates: Not applicable for this SDG				

Sample dilutions: NA

ITEM	YES	NO	N/A	COMMENTS
Initial Calibration Documentation Included in Lab Package?	x			Cal source (soils WThcrIM-00022) (aqS WThcrIM2-00022)
1. Blank plus 4 standards (7196A) or blank plus 3 standards (7199), 2. Correlation coefficient of ≥ 0.995 (7196A) or ≥ 0.999 (7199). 3. Calibrate daily or each time instrument is set up.	x			1. Each analysis 1 blank and 5 cal STDs 2. All analysis meet CC 3. yes
Calibration Check Standard (CCS) for 7196A and Quality Control Sample (QCS) for 7199 Included in Lab Package?	x			Check source (soils WThcrIM3-00011) (aqS WThcrIM4-00024)
1. %R criteria met? (90 - 110%). 2. Correct frequency of once every 10 samples 3. CCS and QCS from independent source and at mid level of calibration curve.	x			1. All met %R 2. Analyzed every 10 samples or more frequent 3. Yes
Calibration Blanks	x			Aqs – 460-70378/1 and Soil 460-71348/1
1. Analyzed prior to initial calibration standards and after each CCS/QCS? 2. Absolute value should not exceed MDL.	x			1. Yes 2. Yes
Method Blank and Field Blanks Included in Lab Package?	x			Field blank included with this SDG EB-041211
1. Method blank analyzed with each preparation batch? 2. Absolute value should not exceed MDL.	x			1. Yes, aqs – 460-70378/9 and soils –460- 71080/1-A 2. Yes
Eh and pH data .	x			
Eh and pH data was included and plotted for all samples?	x			
Soluble Matrix Spike Data Included in Lab Package?	x			460-25254-8 (EF-B03-27.0)
1. %R criteria met? (75-125%R). 2. Was the spike concentration 40 mg/Kg? 3. Was a sample spiked at the frequency of 1/batch or 20 samples?	x	X*		1. Yes, 79% 2. No, 51.4 mg/kg 3. Yes
Insoluble Matrix Spike Data Included in Lab Package?	x			460-25254-8 (EF-B03-27.0)
1. %R criteria met? (75-125%R). 2. Was the spike concentration 400 to 800 mg/Kg? 3. Was a sample spiked at the frequency of 1/batch or 20 samples?	x			1. Yes, 92% 2. No, 910 mg/kg 3. yes
Post Digestion Spike	x			460-25254-8 (EF-B03-27.0)
1. %R criteria met? (85-115%R). 2. Was the spike concentration 40 mg/Kg or twice the sample concentration? 3. Was a sample spiked at the frequency of 1/batch or 20 samples?	x			1. Yes, 104% 2. Yes, 51.4 mg/kg 3. Yes
Sample Duplicate Data Included in Lab Package?	x			460-25254-8 (EF-B03-27.0)
1. RPD criteria met? (RPD < 20%) of both results are $\geq 4x$ RL or control limit of $\pm RL$ if both results are $< 4x$ RL. 2. Was a sample spiked at the frequency of 1/batch or 20 samples?	x			1. The RPD was NC due to nondetect results for both the original and duplicate samples.
Was a Laboratory Control Sample (LCS) Included in Lab Package?	x			
1. %R criteria met? (80-120%R). 2. Was an LCS analyzed at the frequency of 1/batch or 20 samples?	x			1. Yes 2. Yes
Miscellaneous Items.				
1. For soils by 7196A, was the pH within a range of 7.0-8.0? 2. For soils by 7199, was the pH within a range of 9.0-9.5? 3. For aqueous by 7196A, was the pH with a range of 1.5-2.5? 4. For soils (3060A), was the digestion temperature 90-95°C for at least 60 minutes? 5. For 7199, was each sample injected twice and was the RPD ≤ 20 ?	x			1. Yes 2. NA 3. Yes 4. Yes 5. NA

Holding Time

Sample ID	Method	Days from Sampling to Prep	Days from Prep to Analysis	Days from Sampling to Analysis	SP Status	PA Status	SA Status
EF-B03-10.0	SW7196	7	2	9	OK @30 days	OK @7 days	OK @37 days
EF-B03-12.0	SW7196	7	2	9	OK @30 days	OK @7 days	OK @37 days
EF-B03-16.0	SW7196	7	2	9	OK @30 days	OK @7 days	OK @37 days
EF-B03-22.0	SW7196	7	2	9	OK @30 days	OK @7 days	OK @37 days
EF-B03-27.0	SW7196	7	2	9	OK @30 days	OK @7 days	OK @37 days
EF-B03-6.0	SW7196	7	2	9	OK @30 days	OK @7 days	OK @37 days
EF-B03-8.0	SW7196	7	2	9	OK @30 days	OK @7 days	OK @37 days
EF-B05-4.0	SW7196	7	2	9	OK @30 days	OK @7 days	OK @37 days
EF-B06-0.5	SW7196	7	2	9	OK @30 days	OK @7 days	OK @37 days
EF-B06-2.0	SW7196	7	2	9	OK @30 days	OK @7 days	OK @37 days
EF-B06-4.0	SW7196	7	2	9	OK @30 days	OK @7 days	OK @37 days
EB-041211	SW7196			1			OK @1 days

SDG#: 460-25254

Cr+6 ICAL -04/21/11
Soils
(p. 1447 of data pkg)

x - concentration	y - response
0	0
50	0.042
100	0.086
500	0.399
750	0.6
1250	0.991

(p. 2626 of data pkg)

AECOM Calculated Intercept	-4.218	OK	Reported intercept	-4.2180
AECOM Slope	1263	OK	Reported Slope	1263
AECOM Calculated r	0.99998	OK rounding	Reported r	1.0000

EF-B03-27.0 (460-25254-8)

(p. 1456 of data pkg)

Background reading	0
Total absorbance	0.006
Total absorbance - background	0.006
Instrument Response (µg/L)	3.361
Sample weight (g)	2.5
Final Volume (mL)	100
Percent solids	0.778
Dilution Factor	1

AECOM Calculated Result (mg/Kg)	0.2	OK sample ND	Reported Result (mg/Kg)	2.6 U
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LCS calculation

LCSS 460-71080/2-A pg. 1407

LCS Soluble Instrument Response	0.479
Instrument Concentration (ug/L)	600.821
Sample weight	2.5
Percent solids	1
Dilution Factor	1

AECOM Calculated LCS Result (mg/Kg)	24.03	OK	Reported Result (mg/Kg)	24.03
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%R = Found/True*100

True Value (mg/kg)	25.4
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AECOM Calculated %R	94.6	OK rounding	Reported %R	95
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MS calculation

p. 1456 460-25254-8 MSS (EF-B03-27.0)

MS soluble Instrument Response	0.627
Instrument Concentration (ug/L)	787.764
Sample weight (g)	2.5
Percent solids	0.778
Dilution Factor	1

AECOM Calculated MS Result (mg/Kg)	40.50	OK rounding	Reported Result (mg/Kg)	40.49
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%R = Found/True*100

pg. 1401

True Value (mg/kg)	51.4
Native concentration (g)	0

%R	78.8	OK rounding	Reported %R	79
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Percent Solids **pg. 1460**

Empty dish weight= 1
 Wet weight= 8.39
 Dry weight= 6.75

AECOM%solids =	77.8	OK	TestAmerica reported %solids=	77.8
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EF-B03-27.0 (460-25254-8) **pg. 1456 of data pkg**

Low Standard 50
 Initial weight (g) 2.5
 Final volume (mL) 100
 Percent solids 0.778
 Dilution Factor 1.00

Reporting Limit	2.6	OK	Reported RL (mg/Kg)=	2.6
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EF-B03-6.0 (460-25254-1) **p. 2645 of data pkg**

Background reading 0.004
 Total absorbance 0.018
 Total absorbance - background 0.014
 Instrument Response (µg/L) 13.466
 Sample weight (g) 2.54
 Final Volume (mL) 100
 Percent solids 0.88
 Dilution Factor 1

AECOM Calculated Result (mg/Kg)	0.6	OK	Reported Result (mg/Kg)	0.6 J
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EF-B03-10.0 (460-25254-3) **p. 2645 of data pkg**

Background reading 0.002
 Total absorbance 0.01
 Total absorbance - background 0.008
 Instrument Response (µg/L) 5.887
 Sample weight (g) 2.5
 Final Volume (mL) 100
 Percent solids 0.938
 Dilution Factor 1

AECOM Calculated Result (mg/Kg)	0.3	OK sample ND	Reported Result (mg/Kg)	2.1 U
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EF-B03-8.0 (460-25254-4) **p. 2645 of data pkg**

Background reading 0
 Total absorbance 0.095
 Total absorbance - background 0.095
 Instrument Response (µg/L) 115.779
 Sample weight (g) 2.52
 Final Volume (mL) 100
 Percent solids 0.924
 Dilution Factor 1

AECOM Calculated Result (mg/Kg)	5.0	OK	Reported Result (mg/Kg)	5.0
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EF-B03-12.0 (460-25254-5) **p. 2645 of data pkg**

Background reading 0
 Total absorbance 0.04
 Total absorbance - background 0.04
 Instrument Response (µg/L) 46.307
 Sample weight (g) 2.5
 Final Volume (mL) 100
 Percent solids 0.873
 Dilution Factor 1

AECOM Calculated Result (mg/Kg)	2.1	OK sample ND	Reported Result (mg/Kg)	2.1 U
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EF-B03-16.0 (460-25254-6)

p. 2645 of data pkg

Background reading	0
Total absorbance	0.012
Total absorbance - background	0.012
Instrument Response (µg/L)	10.940
Sample weight (g)	2.53
Final Volume (mL)	100
Percent solids	0.878
Dilution Factor	1

AECOM Calculated Result (mg/Kg)	0.5	OK sample ND	Reported Result (mg/Kg)	2.3 U
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EF-B03-22.0 (460-25254-7)

p. 2645 of data pkg

Background reading	0
Total absorbance	0.07
Total absorbance - background	0.07
Instrument Response (µg/L)	84.201
Sample weight (g)	2.57
Final Volume (mL)	100
Percent solids	0.817
Dilution Factor	1

AECOM Calculated Result (mg/Kg)	4.0	OK	Reported Result (mg/Kg)	4.0
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EF-B05-4.0 (460-25254-9)

p. 2645 of data pkg

Background reading	0.002
Total absorbance	0.13
Total absorbance - background	0.128
Instrument Response (µg/L)	157.463
Sample weight (g)	2.55
Final Volume (mL)	100
Percent solids	0.733
Dilution Factor	1

AECOM Calculated Result (mg/Kg)	8.4	OK	Reported Result (mg/Kg)	8.4
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EF-B06-5.0 (460-25254-10)

p. 2645 of data pkg

Background reading	0.002
Total absorbance	0.031
Total absorbance - background	0.029
Instrument Response (µg/L)	32.413
Sample weight (g)	2.56
Final Volume (mL)	100
Percent solids	0.905
Dilution Factor	1

AECOM Calculated Result (mg/Kg)	1.4	OK	Reported Result (mg/Kg)	1.4 J
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EF-B06-2.0 (460-25254-11)

p. 2645 of data pkg

Background reading	0.003
Total absorbance	0.014
Total absorbance - background	0.011
Instrument Response (µg/L)	9.676
Sample weight (g)	2.58
Final Volume (mL)	100
Percent solids	0.806
Dilution Factor	1

AECOM Calculated Result (mg/Kg)	0.5	OK sample ND	Reported Result (mg/Kg)	2.4 U
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AECOM

EF-B06-4.0 (460-25254-13)

p. 2646 of data pkg

Background reading	0.004				
Total absorbance	0.024				
Total absorbance - background	0.02				
Instrument Response (µg/L)	21.0				
Sample weight (g)	2.53				
Final Volume (mL)	100				
Percent solids	83				
Dilution Factor	1				
AECOM Calculated Result (mg/Kg)	0.01	OK		Reported Result (mg/Kg)	1.0 J

Data Validation Report

Project	PPG – GA EF	Page	1
Laboratory	Test America, NJ		
Laboratory Job No.	460-25301		
Analysis/Method	TAL Metals (Site Specific Limited List) SW-846 3050B/6010B/7471A		
Validation Level	QC Summary Review (Limited)		
Site Location/Address	Garfield Avenue, Soil RI, Site 114, Jersey City, NJ		
AECOM Project Number	60154801.0007		
Prepared by Sharon McKechnie/AECOM	Completed on: May 25, 2011		
Reviewed by Lisa Krowitz/AECOM	File Name:2011-05-25 TAL Metals DV Report 460-25301 F.docx		

Introduction

The results of quality control data analyzed with site samples were used to assess the overall reliability of the data. The following qualifiers were used to identify data quality issues:

- U: Indicates the analyte was not detected in the sample above the sample reporting limit.
- J: Indicates the result was an estimated value; the associated numerical value was an approximate concentration of the analyte in the sample.
- UJ: Indicates the analyte was not detected above the reporting limit and the reporting limit was approximate.
- R: The sample result was rejected due to serious deficiencies; the presence or absence of the analyte could not be confirmed.

Sample Information

The samples listed below were collected by AECOM on April 13, 2011 as part of the Garfield Avenue Soil RI sampling task at PPG Site 114, Jersey City, New Jersey.

Field ID	Laboratory ID	Matrix	Fraction
EF-B06-6.0	460-25301-1	Soil	TAL Metals
EF-B06-12.0	460-25301-3	Soil	TAL Metals
EF-B06-17.0	460-25301-4	Soil	TAL Metals

Field ID	Laboratory ID	Matrix	Fraction
EF-B06-22.0	460-25301-5	Soil	TAL Metals
EF-B05-22.5	460-25301-10	Soil	TAL Metals
EF-B07-2.5	460-25301-13	Soil	TAL Metals
EF-B08-2.5	460-25301-17	Soil	TAL Metals
EB-041311(Equipment blank collected 4/13/11)	460-25301-19	Aqueous	TAL Metals

Soil samples were collected following the procedures detailed in the Approved Remedial Investigation Work Plan-Soil Non-Residential Chromate Production Waste Sites 114, 132, 133, 135, 137, 143, and 186 (March 2011).

General Comments

The data package was complete. Quality control (QC) issues identified during validation are discussed below. Selected results were qualified as estimated for certain QC nonconformances. Refer to the Target Analyte Summary Hit List for a listing of all detected results, qualified results, and associated qualifications, where applicable.

Matrix Spike Results

Some matrix spike/matrix spike duplicates (MS/MSD) for mercury, aqueous metals, and solid metals batches were performed on non-site specific samples or samples from other SDGs. No actions were taken for MS and/or MSD nonconformances from non-site specific samples due to potential differences in the sample matrices. Refer to Attachments A and B for the MS/MSD nonconformances and qualified results.

Sample Reporting Limits

Some sample results were qualified "J" as estimated by the laboratory. The reported results were less than the reporting limit (RL), but greater than or equal to the method detection limit (MDL) and; therefore, are approximate values. Refer to the Soil Target Analyte Summary Hitlist for a listing of all qualified results and associated qualifications.

Selected soil and/or aqueous reporting limits exceeded the NJDEP Default Impact to GW Soil Screening Levels and/or NJDEP Specific GW Quality Criteria, respectively: The non-detect results with reporting limits that exceeded the NJDEP standards are presented in the attached Data Validation Report Form.

Data Quality and Recommendations

In general, these data appear to be valid and may be used for decision-making purposes. With the exception of the qualified results, all TAL metals results were accepted as reported by the laboratory.

Attachments

Attachment A Target Analyte Summary Hitlist(s)

Attachment B Data Validation Report Form

Attachment A

Target Analyte Summary Hitlist(s)

Soil Target Analyte Summary Hit List

Site Name Garfield Avenue Soil RI, Site 114, Jersey City, NJ
Sampling Date April 13, 2011
Lab Name/ID Test America, Edison, NJ
SDG No 460-25301
Sample Matrix Soil
Trip Blank ID NA
Field Blank ID EB041311

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
EF-B06-6.0	460-25301-1	ALUMINUM	U	10800	10800	50.3		
EF-B06-6.0	460-25301-1	ARSENIC	U	8.2	8.2	1.3		
EF-B06-6.0	460-25301-1	BARIUM	U	41.5	41.5	50.3	Qualify	23
EF-B06-6.0	460-25301-1	BERYLLIUM	U	0.45	0.45	0.50	Qualify	23
EF-B06-6.0	460-25301-1	CALCIUM METAL	U	1390	1390	1260		
EF-B06-6.0	460-25301-1	CHROMIUM	U	42.1	42.1	2.5	Qualify	16
EF-B06-6.0	460-25301-1	COBALT	U	8.7	8.7	12.6	Qualify	23
EF-B06-6.0	460-25301-1	COPPER	U	22.5	22.5	6.3		
EF-B06-6.0	460-25301-1	IRON	U	19300	19300	37.7		
EF-B06-6.0	460-25301-1	LEAD	U	155	155	1.3		
EF-B06-6.0	460-25301-1	MAGNESIUM	U	2570	2570	1260		
EF-B06-6.0	460-25301-1	MANGANESE	U	279	279	3.8		
EF-B06-6.0	460-25301-1	NICKEL	U	14.1	14.1	10.1		
EF-B06-6.0	460-25301-1	POTASSIUM	U	801	801	1260	Qualify	23
EF-B06-6.0	460-25301-1	SODIUM	U	193	193	1260	Qualify	23
EF-B06-6.0	460-25301-1	VANADIUM	U	23.7	23.7	12.6		
EF-B06-6.0	460-25301-1	ZINC	U	155	155	7.5		
EF-B06-6.0	460-25301-1	MERCURY	U	0.75	0.75	0.041		
EF-B05-22.5	460-25301-10	ALUMINUM	U	4170	4170	44.6		
EF-B05-22.5	460-25301-10	ARSENIC	U	5.2	5.2	1.1		
EF-B05-22.5	460-25301-10	BARIUM	U	29.3	29.3	44.6	Qualify	23
EF-B05-22.5	460-25301-10	BERYLLIUM	U	0.44	0.44	0.45	Qualify	23
EF-B05-22.5	460-25301-10	CALCIUM METAL	U	1470	1470	1120		
EF-B05-22.5	460-25301-10	CHROMIUM	U	12.4	12.4	2.2	Qualify	16

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
EF-B05-22.5	460-25301-10	COBALT	U	5.0	5.0	11.2	Qualify	23
EF-B05-22.5	460-25301-10	COPPER	U	10.9	10.9	5.6		
EF-B05-22.5	460-25301-10	IRON	U	10300	10300	33.5		
EF-B05-22.5	460-25301-10	LEAD	U	12.7	12.7	1.1		
EF-B05-22.5	460-25301-10	MAGNESIUM	U	2410	2410	1120		
EF-B05-22.5	460-25301-10	MANGANESE	U	358	358	3.3		
EF-B05-22.5	460-25301-10	NICKEL	U	8.6	8.6	8.9	Qualify	23
EF-B05-22.5	460-25301-10	POTASSIUM	U	1030	1030	1120	Qualify	23
EF-B05-22.5	460-25301-10	SODIUM	U	106	106	1120	Qualify	23
EF-B05-22.5	460-25301-10	VANADIUM	U	15.5	15.5	11.2		
EF-B05-22.5	460-25301-10	ZINC	U	49.1	49.1	6.7		
EF-B07-2.5	460-25301-13	VANADIUM	U	234	234	15.4		
EF-B08-2.5	460-25301-17	VANADIUM	U	74.2	74.2	13.5		
EF-B06-12.0	460-25301-3	ALUMINUM	U	6210	6210	46.0		
EF-B06-12.0	460-25301-3	ARSENIC	U	2.7	2.7	1.2		
EF-B06-12.0	460-25301-3	BARIUM	U	39.6	39.6	46.0	Qualify	23
EF-B06-12.0	460-25301-3	BERYLLIUM	U	0.36	0.36	0.46	Qualify	23
EF-B06-12.0	460-25301-3	CALCIUM METAL	U	796	796	1150	Qualify	23
EF-B06-12.0	460-25301-3	CHROMIUM	U	91.9	91.9	2.3	Qualify	16
EF-B06-12.0	460-25301-3	COBALT	U	4.2	4.2	11.5	Qualify	23
EF-B06-12.0	460-25301-3	COPPER	U	11.4	11.4	5.8		
EF-B06-12.0	460-25301-3	IRON	U	10500	10500	34.5		
EF-B06-12.0	460-25301-3	LEAD	U	8.0	8.0	1.2		
EF-B06-12.0	460-25301-3	MAGNESIUM	U	2400	2400	1150		
EF-B06-12.0	460-25301-3	MANGANESE	U	278	278	3.5		
EF-B06-12.0	460-25301-3	NICKEL	U	8.9	8.9	9.2	Qualify	23
EF-B06-12.0	460-25301-3	POTASSIUM	U	959	959	1150	Qualify	23
EF-B06-12.0	460-25301-3	SODIUM	U	138	138	1150	Qualify	23
EF-B06-12.0	460-25301-3	VANADIUM	U	15.5	15.5	11.5		
EF-B06-12.0	460-25301-3	ZINC	U	32.7	32.7	6.9		
EF-B06-17.0	460-25301-4	ALUMINUM	U	6080	6080	45.5		
EF-B06-17.0	460-25301-4	ARSENIC	U	6.0	6.0	1.1		
EF-B06-17.0	460-25301-4	BARIUM	U	63.4	63.4	45.5		
EF-B06-17.0	460-25301-4	BERYLLIUM	U	0.53	0.53	0.46		
EF-B06-17.0	460-25301-4	CALCIUM METAL	U	1710	1710	1140		
EF-B06-17.0	460-25301-4	CHROMIUM	U	87.7	87.7	2.3	Qualify	16
EF-B06-17.0	460-25301-4	COBALT	U	6.2	6.2	11.4	Qualify	23
EF-B06-17.0	460-25301-4	COPPER	U	13.7	13.7	5.7		

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
EF-B06-17.0	460-25301-4	IRON	U	13500	13500	34.1		
EF-B06-17.0	460-25301-4	LEAD	U	15.1	15.1	1.1		
EF-B06-17.0	460-25301-4	MAGNESIUM	U	3970	3970	1140		
EF-B06-17.0	460-25301-4	MANGANESE	U	539	539	3.4		
EF-B06-17.0	460-25301-4	NICKEL	U	13.5	13.5	9.1		
EF-B06-17.0	460-25301-4	POTASSIUM	U	1580	1580	1140		
EF-B06-17.0	460-25301-4	SODIUM	U	238	238	1140	Qualify	23
EF-B06-17.0	460-25301-4	VANADIUM	U	20.0	20.0	11.4		
EF-B06-17.0	460-25301-4	ZINC	U	55.4	55.4	6.8		
EF-B06-22.0	460-25301-5	ALUMINUM	U	4870	4870	47.9		
EF-B06-22.0	460-25301-5	ARSENIC	U	6.7	6.7	1.2		
EF-B06-22.0	460-25301-5	BARIIUM	U	60.9	60.9	47.9		
EF-B06-22.0	460-25301-5	BERYLLIUM	U	0.42	0.42	0.48	Qualify	23
EF-B06-22.0	460-25301-5	CALCIUM METAL	U	1880	1880	1200		
EF-B06-22.0	460-25301-5	CHROMIUM	U	129	129	2.4	Qualify	16
EF-B06-22.0	460-25301-5	COBALT	U	4.5	4.5	12.0	Qualify	23
EF-B06-22.0	460-25301-5	COPPER	U	8.1	8.1	6.0		
EF-B06-22.0	460-25301-5	IRON	U	11300	11300	35.9		
EF-B06-22.0	460-25301-5	LEAD	U	7.7	7.7	1.2		
EF-B06-22.0	460-25301-5	MAGNESIUM	U	2290	2290	1200		
EF-B06-22.0	460-25301-5	MANGANESE	U	433	433	3.6		
EF-B06-22.0	460-25301-5	NICKEL	U	8.7	8.7	9.6	Qualify	23
EF-B06-22.0	460-25301-5	POTASSIUM	U	1270	1270	1200		
EF-B06-22.0	460-25301-5	SODIUM	U	266	266	1200	Qualify	23
EF-B06-22.0	460-25301-5	VANADIUM	U	16.3	16.3	12.0		
EF-B06-22.0	460-25301-5	ZINC	U	31.0	31.0	7.2		

Note: The "U" under Method Blank column indicates a nondetect result
The "U" under the Laboratory Sample Result and Validation Sample Result columns indicate a nondetect result at the RL.

NJ DEP Hitlist Footnotes:

- 1) The value reported is less than or equal to 3x the value in the method blank. It is the policy of NJDEP-DPFSR to negate the reported value due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.

- 2) The value reported is greater than three (3) but less than ten (10) times the value in the method blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to the method blank contamination. The "B" qualifier alerts the end-user to the presence of this analyte in the method blank.
- 3) The value reported is less than or equal to 3x the value in the trip/field blank. It is the policy of NJDEP-DPF SR to negate the reported value as due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
- 4.) The value reported is greater than 3x but less than ten (10) the value in the trip/field blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to trip/field blank contamination.
- 5.) The concentration reported by the laboratory is incorrectly calculated.
- 6.) The laboratory failed to report the presence of the analyte in the sample.
- 7.) The reported metal value was qualified because the Calibration Verification Standard was not within the recovery range (90-110 percent).
- 8) In the MS/MSD Sample Analysis, this analyte fell outside the control limits of 20% RPD. Therefore, the result was qualified.
- 9.) This analyte was qualified because the laboratory performed the MS/MSD Analysis on a field blank.
- 10) The reported analyte was qualified because the associated Calibration Blank result was greater than the MDL.
- 11) The reported value was qualified because serial dilution analysis was not within QC limit of 10% D.
- 12) This analyte is rejected because the laboratory exceeded the holding time for digestion and analysis.
- 13) The laboratory subtracted the method blank from the sample result. The reviewer's calculation has added the method blank result to the reported concentration.
- 14) The photocopy submitted is illegible. Therefore, the QA reviewer cannot read the laboratory's reported concentration result.
- 15) The reported or nondetected value was qualified because the MS/MSD spike recovery was less than 75 percent.
- 16) The reported value was qualified because the MS/MSD spike recovery was greater than 125 percent.
- 17) The non-detected value was qualified (UJ) because the MS/MSD spike recovery was less than 75 percent. The possibility of a false negative exists.

- 18) In the field duplicate analysis this analyte fell outside of the RPD control limits. Therefore, the result was qualified.
- 19) The laboratory failed to analyze an MS/MSD for the particular matrix. Therefore, the result was rejected.
- 20) The reported or nondetect value was qualified with an uncertain bias because the MS %R and MSD %R had opposing biases.
- 21) In the soil laboratory duplicate analysis this analyte fell outside of the control limits of 35% RPD. Therefore, the result was qualified.
- 22) The reported or nondetected value was rejected because the MS/MSD spike recovery was less than 10 percent.
- 23) The reported analyte was qualified (J) because the associated sample result was greater than the MDL but less than the RL.
- 24) The reported value was qualified because the percent solids was <50%

Attachment B
Data Validation Report Form

Client Name: PPG Industries	Project Number: 60154801-0007
Site Location: PPG- Garfield Avenue Soil RI, Site 114, Jersey City, NJ	Project Manager: Robert Cataldo
Laboratory: Test America, New Jersey	Limited or Full Validation (circle one)
Laboratory Job No: 460-25301	Date Checked: 5/25/2011
Validator: Sharon McKechnie	Peer Review: Lisa Krowitz

ITEM	YES	NO	N/A	COMMENTS
Sample results included?	X			
Reporting Limits met project requirements?	X	X*		*See attached table "Dilutions and Reporting Limits". Elevated reporting limits due to sample dilutions.
Field I.D. included?	X			
Laboratory I.D. included?	X			
Sample matrix included?	X			
Sample receipt temperature 2-6°C?	X			1.2°C, no qualifications for minor deviation from lower temp limit
Signed COCs included?	X			
Date of sample collection included?	X			Collected 4/13/2011
Date of sample digestion included?	X			
Date of analysis included?	X			
Holding time met QC criteria? Metals -180 days from sample collection Mercury – 28 days from sample collection If HT exceeded by - ≤ 10 days, J/UJ all results - > 10 days, R all results	X			See attached table "Hold Times"
Method reference included?	X			
Laboratory Case Narrative included?	X			
Sample Dilutions	X			See attached table "Dilutions and Reporting Limits"
Field Duplicates ("x" appended to sample ID) (RPD calculation on separate sheet)		X		None this SDG
Definitions: MDL – Method Detection Limit; %R – Percent Recovery; RL – Reporting Limit; RPD – Relative Percent Difference; RSD – Relative Standard Deviation :Corr – Correlation Coefficient.				
Comments				
Selected metals in all soil samples were reanalyzed within hold time				

QA/QC CHECKLIST FOR TAL METALS ANALYSIS

ITEM	YES	NO	N/A	COMMENTS
Initial Calibration Documentation Included in Lab Package?			X	Not reviewed for limited validation
1. Calibrate daily or each time instrument is set up?. If no, reject (R) data. 2. ICP (6010) - Blank plus 1 standard? If no, reject (R) data. 3. Hg (7470/7471) – Blank plus 5 standards? If no, reject (R) data.				
Initial Calibration Verification Standard (ICV) for ICP (6010) and Initial Calibration Check Standard (ICCS) for Hg (7470/7471) Included in Lab Package?			X	Not reviewed for limited validation
1. Analyzed immediately after initial calibration? If no, reject (R) data. 2. %R criteria met? (90 - 110%). If no, J positive results for affected analyte(s) if %R between 80-89% and 111-120% and indicate bias UJ non-detect results for affected analyte(s) if R% between 80-89% R all data for affected analyte(s) if <80% or >120% 3. Spot check ICV/ICCS results for several analytes				
Continuing Calibration Verification Standard (CCV) for ICP (6010) and Calibration Check Standard (CCS) for Hg (7470/7471) included in Lab Package?			X	Not reviewed for limited validation
1. Analyzed immediately after each ICV/ICC/CB and after every 10 samples? If no, reject (R) data. 2. CCS and CCV from independent source and at mid level of calibration curve. If no, reject (R) data. 3. %R criteria met? (90 - 110%) If no, J positive results for affected analyte(s) if %R between 80-89% and 111-120% and indicate bias UJ non-detect results for affected analyte(s) if %R between 80-89% R all data for affected analyte(s) if %R <80% or >120% 4. Spot check CCV/CCS results for several analytes				
Low Calibration Standard (CRI) included in Lab Package?			X	Not reviewed for limited validation
1. %R criteria met? - 50 - 150% for Co, Mn, Zn by ICP-MS, PB, TI by 6010) - 70-130% all others If no, refer to ILM05.4 NJ SOP 5.A.2 for actions.				
Calibration Blanks			X	Not reviewed for limited validation
1. Analyzed immediately after daily calibration and after each ICV/ICC/CCV/CCS, and after every 10 samples? If no, reject (R) data. 2. Absolute value $\leq 3xIDL$? If no, - if sample result $\leq 10xCB$ result, qualify affected analyte(s) in associated samples with CB - if sample result $> 10xCB$ result, no qualification				
Method Blank included in Lab Package?	X			
1. Method blank analyzed with each preparation batch or every SDG, or 1/20 samples? If no, reject (R) data, except no aqueous MB required for FB/EB if only soil samples were analyzed. 2. Method blank analyzed 1/20 samples? If - MB 1/25, J sample results from 21-25 - MB > 1/25, R sample results after 25 th sample 3. MB result nondetect? If no, - Sample result $\leq 3xMB$, negate UB - Sample result $<3xMB$, but $\leq 10xMB$, JB - Sample result $> 10xMB$, no qualification 4. Negative MB result reported? If yes, -Positive sample result $\leq 10xMB$, qualify estimated, biased low (J) -Non-detect sample result, qualify UJ, may be false non-detect				1. Yes 2. 1/ batch 3. Yes 4.No
Field Blanks/Equipment Blanks included in Lab Package?	X			Blanks apply to samples collected during same week as blank
1. FB/EB result nondetect? If no, - Sample result $\leq 3xFB/EB$, negate U - Sample result $<3xFB/EB$, but $\leq 10xFB/EB$, J - Sample result $> 10xFB/EB$, no qualification				EB041311, all ND

ITEM	YES	NO	N/A	COMMENTS
ICP Interference Check Sample (ICS) included in Lab Package?			X	Not reviewed for limited validation
1. Analyzed at beginning of analytical run? If no, reject (R) data. 2. %R criteria met? (80-120%) If no, %R > 120%, no qualification if sample result non-detect %R between 121-150%, J positive results, biased high %R between 50-79%, J/UJ results, biased low %R <50% or >150%, reject (R) result 3. Spot check accuracy of %Rs				
Matrix Spike/Matrix Spike Duplicate Data Included in Lab Package?	X			MSD also used as laboratory duplicate QC
1. MS/MSD %R (75-125%R) and RPD ($\pm 20\%$) criteria met? - %R >125% J positive results for affected analyte(s) for all samples in the same batch/SDG, accept NDs. - %R <75% J/UJ for affected analyte(s) for all samples in the same batch/SDG - RPD outside $\pm 20\%$ J positive results for affected analyte(s) for all samples in the same batch/SDG, accept NDs. 2. Was a sample spiked at the frequency of 1/batch or 20 samples? 3. Was the MS performed on a site sample? 4. Was the MS performed on a FB/EB or TB? If yes, J all sample data.		X		1. Some MS %R nonconformances. Refer to MS/MSD Summary Table. 2. Frequency OK 3. Spiked non site samples not applied 4. NA
Serial Dilution			X	Not reviewed for limited validation
1. %D ($\leq 10\%$ R) criteria met? - If analyte concentration > 25xIDL (7000) or > 10x IDL (6010) and %D > 10% J positive results for affected analyte(s) for all samples in the same batch/SDG, accept NDs. 2. Was the frequency 1/batch or 20 samples? 3. Was a site sample used? 4. Was a FB/EB or TB used? If yes, J all sample data. 5. Spot check accuracy of %Ds				
Post Digestion Spike			X	Not reviewed for limited validation
1. %R criteria met? (75-125%R). - %R >125% J positive results for affected analyte(s) for all samples in the same batch/SDG, accept NDs. - %R <75% J/UJ affected analyte(s) for all samples in the same batch/SDG. 2. Was the spike performed on a FB/EB or TB? If yes, J all sample data? 3. Was a sample spiked at the frequency of 1/batch or 20 samples?				
Laboratory Control Sample Data Included in Lab Package?	X			
1. LCS %R (80-120%R) criteria met? If no, J/UJ all affected analyte(s) for all samples in the same batch/SDG. data. 2. Was a sample spiked at the frequency of 1/batch or 20 samples? If no, J/UJ affected analyte(s) for all sample in the same batch/SDG.				1. Yes 2. 1/batch
Laboratory Duplicate Data Included in Lab Package?	X			
<u>Aqueous</u> If RPD is >20% but <100% and sample and field duplicate results are >5x the QL, estimate (J) results > the QL. If RPD is >100%, reject (R) results \geq the QL. If sample and/or duplicate is <5x the QL and absolute difference is > the QL, estimate (J) positive results <5x the QL and nondetects (UJ). If absolute difference is > 2x the QL, reject (R) non detects and positive results <5x the QL. <u>SOIL:</u> If RPD is >35% but <120% and sample and field duplicate results are >5x the QL, estimate (J) results > the QL. If RPD is > 120%, reject (R) results > the QL. If sample and/or duplicate is <5x the QL and absolute difference is >2x the QL, estimate (J) positive results <5x QL and nondetects (UJ). If absolute difference is >4x the QL, reject (R) non detects and positive results <5x QL.				All met criteria

ITEM	YES	NO	N/A	COMMENTS
Field Duplicate Data Included in Lab Package?		X		
<p><u>Aqueous</u> If RPD is >20% but <100% and sample and field duplicate results are >5x the QL, estimate (J) results > the QL. If RPD is >100%, reject (R) results ≥ the QL. If sample and/or duplicate is <5x the QL and absolute difference is > the QL, estimate (J) positive results <5x the QL and nondetects (UJ). If absolute difference is > 2x the QL, reject (R) non detects and positive results <5x the QL.</p> <p><u>SOIL:</u> If RPD is >35% but <120% and sample and field duplicate results are >5x the QL, estimate (J) results > the QL. If RPD is > 120%, reject (R) results > the QL. If sample and/or duplicate is <5x the QL and absolute difference is >2x the QL, estimate (J) positive results <5x QL and nondetects (UJ). If absolute difference is >4x the QL, reject (R) non detects and positive results <5x QL.</p>				None this SDG

Hold Times

SampleID	Matrix	Analysis Method	Sample Date	Prep Date	Analysis Date	Dilution	Sample To Prep	Prep To Analysis	Sample To Analysis	Status
EF-B05-22.5	SO	SW6010	4/13/2011 12:25	4/14/2011 7:20	4/18/2011 22:58	4	1	4	5	OK @180 days
EF-B06-12.0	SO	SW6010	4/13/2011 9:50	4/14/2011 7:20	4/18/2011 22:47	4	1	4	5	OK @180 days
EF-B06-17.0	SO	SW6010	4/13/2011 10:00	4/14/2011 7:20	4/18/2011 22:51	4	1	4	5	OK @180 days
EF-B06-22.0	SO	SW6010	4/13/2011 10:10	4/14/2011 7:20	4/18/2011 22:54	4	1	4	5	OK @180 days
EF-B06-6.0	SO	SW6010	4/13/2011 9:25	4/14/2011 7:20	4/18/2011 22:36	4	1	4	5	OK @180 days
EF-B07-2.5	SO	SW6010	4/13/2011 11:55	4/14/2011 7:20	4/18/2011 23:02	4	1	4	5	OK @180 days
EF-B08-2.5	SO	SW6010	4/13/2011 13:30	4/14/2011 7:20	4/18/2011 23:05	4	1	4	5	OK @180 days
EB-041311	WQ	SW6020	4/13/2011 15:30	4/20/2011 11:53	4/20/2011 19:00	5	7	0	7	OK @180 days
EB-041311	WQ	SW7470	4/13/2011 15:30	4/14/2011 11:18	4/14/2011 13:32	1	1	0	1	OK @28 days
EF-B05-22.5	SO	SW7471	4/13/2011 12:25	4/14/2011 17:50	4/14/2011 23:22	1	1	0	1	OK @28 days
EF-B06-12.0	SO	SW7471	4/13/2011 9:50	4/14/2011 17:50	4/14/2011 23:16	1	1	0	1	OK @28 days
EF-B06-17.0	SO	SW7471	4/13/2011 10:00	4/14/2011 17:50	4/14/2011 23:18	1	1	0	1	OK @28 days
EF-B06-22.0	SO	SW7471	4/13/2011 10:10	4/14/2011 17:50	4/14/2011 23:20	1	1	0	1	OK @28 days
EF-B06-6.0	SO	SW7471	4/13/2011 9:25	4/14/2011 17:50	4/14/2011 23:11	1	1	0	1	OK @28 days

REPORTING LIMITS AND DILUTIONS

Sample ID	Lab ID	Dilution Factor	Method	Analyte	Result	Detect Flag	Units	NJDEP Impact to GW Soil Screening level (mg/kg)	Flag
EF-B05-22.5	460-25301-10	4	SW6010	CADMIUM	1.1	N	mg/kg	1	RL exceeds
EF-B05-22.5	460-25301-10	4	SW6010	SILVER	2.2	N	mg/kg	1	RL exceeds
EF-B06-12.0	460-25301-3	4	SW6010	CADMIUM	1.2	N	mg/kg	1	RL exceeds
EF-B06-12.0	460-25301-3	4	SW6010	SILVER	2.3	N	mg/kg	1	RL exceeds
EF-B06-17.0	460-25301-4	4	SW6010	CADMIUM	1.1	N	mg/kg	1	RL exceeds
EF-B06-17.0	460-25301-4	4	SW6010	SILVER	2.3	N	mg/kg	1	RL exceeds
EF-B06-22.0	460-25301-5	4	SW6010	CADMIUM	1.2	N	mg/kg	1	RL exceeds
EF-B06-22.0	460-25301-5	4	SW6010	SILVER	2.4	N	mg/kg	1	RL exceeds
EF-B06-6.0	460-25301-1	4	SW6010	CADMIUM	1.3	N	mg/kg	1	RL exceeds
EF-B06-6.0	460-25301-1	4	SW6010	SILVER	2.5	N	mg/kg	1	RL exceeds

MS/MSD Summary Table (Spiked EF-B05-22.5)

METAL	SPIKED SAMPLE RESULT	SAMPLE RESULT	SPIKE ADDED	%R	CRITERIA	ACTIONS
Aluminum	4054	3490	225	252	75-125	spike added <4x samp result, will not apply
Antimony	43.75	2.3 U	56.3	78	75-125	OK
Arsenic	221.0	6.1	225	95	75-125	OK
Barium	223.3	25.1 J	225	88	75-125	OK
Beryllium	5.66	0.62	5.63	90	75-125	OK
Cadmium	5.50	1.1 U	5.63	98	75-125	OK
Calcium	3921	1500	2250	107	75-125	OK
Chromium	44.03	14.0	22.5	133	75-125	J/A all samples in this SDG
Cobalt	60.54	5.4 U	56.3	98	75-125	OK
Copper	33.89	10.5	28.2	83	75-125	OK
Iron	10450	10100	113	309	75-125	spike added <4x samp result, will not apply
Lead	67.39	13.5	56.3	96	75-125	OK
Magnesium	4187	2070	2250	94	75-125	OK
Manganese	403.6	339	56.3	114	75-125	OK
Nickel	67.34	9.1	56.3	103	75-125	OK
Potassium	2544	740 J	2250	80	75-125	OK
Selenium	199.6	2.3 U	225	89	75-125	OK
Silver	4.94	2.3 U	5.63	88	75-125	OK
Sodium	1919	124 J	2250	80	75-125	OK
Thallium	209.8	2.3 U	225	93	75-125	OK
Vanadium	71.47	16.4	56.3	98	75-125	OK
Zinc	119.6	58.3	56.3	109	75-125	OK

Data Validation Report

Project	PPG – GA EF	Page	1
Laboratory	Test America, NJ		
Laboratory Job No.:	460-27221		
Analysis/Method:	Hexavalent Chromium SW846 3060A/7196A (including pH and Eh)		
Validation Level:	Full		
Site Location/Address:	Garfield Avenue Soil RI, Site 114, Jersey City, NJ		
AECOM Project Number:	60158739-0007		
Prepared by: Justin Webster/AECOM	Completed on: June 29, 2011		
Reviewed by: Lisa Krowitz/AECOM	File Name: 2011-06-29 Hex Cr DV Report EF 460-27221-F.docx		

Introduction

The results of quality control data analyzed with site samples were used to assess the overall reliability of the data. The following qualifiers were used to identify data quality issues:

- U: Indicates the analyte was not detected in the sample above the sample reporting limit.
- J: Indicates the result was an estimated value; the associated numerical value was an approximate concentration of the analyte in the sample.
- UJ: Indicates the analyte was not detected above the reporting limit and the reporting limit was approximate.
- R: The sample result was rejected due to serious deficiencies; the presence or absence of the analyte could not be confirmed.

Sample Information

The samples listed below were collected by AECOM on June 3, 2011 as part of the Garfield Avenue Soil RI sampling task at PPG Site 114, Jersey City, New Jersey.

Field ID	Laboratory ID	Matrix	Fraction
EF-B57-12.0	460-27221-17	Soil	Hexavalent Chromium
EF-B57-17.0	460-27221-20	Soil	Hexavalent Chromium
EF-B57-20.0	460-27221-22	Soil	Hexavalent Chromium
EB-060311 (field blank)	460-27221-23	Aqueous	Hexavalent Chromium

The samples were collected following the procedures detailed in the NJDEP – Approved Remedial Investigation Work Plan – Soil Non-Residential Chromate Chemical Production Waste Sites 114, 132, 133, 135, 137, 143, and 186 (March 2011).

General Comments

The data package was incomplete since the chain of custody (COC) was missing from the original data package. The laboratory was contacted and a copy of the COC was 6/6/2011 (see Attachment C Additional Documentation). Quality control (QC) issues identified during validation are discussed below. Refer to the Soil Target Analyte Summary Hit List for a listing of all detected results, qualified results, and associated qualifications, where applicable.

Matrix Spike Results

Soil sample 460-27221-2 (ICO-21-2.0) was selected for soluble and insoluble matrix spike analysis for batch 76729, which contained samples 460-27221-17 (EF-B57-12.0) and 460-27221-20 (EF-B57-17.0). The soluble and insoluble matrix spike recoveries were within the quality control criteria of 75-125%; therefore no qualifications were required for samples EF-B57-12.0 and EF-B57-17.0.

Soil sample ICO-14-10.0, from SDG 460-27297, was selected for soluble and insoluble matrix spike analysis for batch 77009, which was associated with sample EF-B57-20.0 in this SDG. The initial analysis (batch 77009) soluble and insoluble matrix spike recoveries were 4% and 52%, respectively, which did not meet quality control criteria of 75-125%R. The post spike result for the initial analysis (batch 77009) was recovered at 99%. Since the initial soluble and insoluble matrix spike recoveries did not meet acceptable criteria, the laboratory performed a re-extraction and re-analysis for all samples associated with this SDG under a new batch (77134).

The re-analysis (batch 77134) soluble and insoluble matrix spike recoveries were 9% and 51%, which again did not meet the quality control criteria of 75-125%R. The post spike result for the re-analysis (77134) was recovered at 107%, which again met the quality control criteria of 85-115%.

Since the re-analysis matrix spikes again failed to meet quality control criteria, additional parameters were analyzed to determine if possible matrix interferences could be the cause for the poor soluble matrix spike recoveries. The samples were tested for pH and oxidative reduction potential (ORP) and plotted on an Eh/pH phase diagram chart. From this chart, the source sample 460-27297-1 (ICO-14-10.0) indicated a slightly oxidizing environment capable of supporting Cr(VI). Thus, the hexavalent chromium result for sample 460-27221-22 (EF-B57-20.0) was reported from the initial analysis (batch 77009) since the MS %Rs from the reanalysis showed no significant improvement. However, due to the oxidizing conditions in the sample matrix, the hexavalent chromium result for sample EF-B57-20.0 was qualified as estimated (J) due to the low MS %Rs which varied from 4% to 52%.

Laboratory Duplicate Results

Soil sample 460-27221-2 (ICO-21-2.0) was selected as the laboratory duplicate sample associated with samples 460-27221-17 (EF-B57-12.0) and 460-27221-20 (EF-B57-17.0) in batch 76729. All criteria were met, no data qualifications were required.

Sample ICO-14-10.0, from SDG 460-27297, was selected as the laboratory duplicate sample associated with sample 460-27221-22 (EF-B57-20.0) in this data set. However, the relative percent differences (RPD) results for the initial analysis (batch 77009) and re-analysis (batch 77134) were not calculable due to a nondetect result in the original and duplicate analyses. No data qualifications were required.

Data Quality and Recommendations

In general, these data appear to be valid as reported by the laboratory and may be used for decision making purposes. No data were rejected. Qualified results were discussed in Attachments A and B below.

Attachments

Attachment A Target Analyte Summary Hitlist(s)

Attachment B Data Validation Report Form

Attachment C Additional Documentation

Attachment A

Target Analyte Summary Hitlist(s)

Soil Target Analyte Summary Hit List

Site Name PPG GA EF Site 114, Jersey City, NJ
Sampling Date June 3, 2011
Lab Name/ID TestAmerica, Edison, NJ
SDG No 460-27221
Sample Matrix Soil
Trip Blank ID NA
Field Blank ID EB060311

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
EF-B57-12.0	460-27221-17	CHROMIUM (HEXAVALENT)	U	111	111	4.8		
EF-B57-17.0	460-27221-20	CHROMIUM (HEXAVALENT)	U	127	127	12.4		
EF-B57-20.0	460-27221-22	CHROMIUM (HEXAVALENT)	U	46.7	46.7	2.2	Qualify	18

Note: The "U" under Method Blank column indicates a nondetect result.

The "U" under the Laboratory Sample Result and Validation Sample Result columns indicate a nondetect result at the RL.

NJDEP Validation Footnote

18. The reported value was qualified (J) because the redigestion spike recovery was less than 75 percent.

Attachment B

Data Validation Report Form

Client Name: PPG Industries	Project Number: 60154801-0007
Site Location: PPG-GAEF	Project Manager: Robert Cataldo
Laboratory: TestAmerica, New Jersey	Limited or <input checked="" type="checkbox"/> Full Validation (circle one)
Laboratory Job No: 460-27221	Date Checked: 6/29/2011
Validator: Justin Webster	Peer: Lisa Krowitz

ITEM	YES	NO	N/A	COMMENTS
Sample results included?	x			1 Aqs TB and 21 Soils
Reporting Limits met project requirements?	x			Soils - 2.2 mg/kg to 12.4 mg/kg
Field I.D. included?	x			
Laboratory I.D. included?	x			
Sample matrix included?	x			
Sample receipt temperature 2-6°C?	x			3.6°C
Signed COCs included?	x			The COC was received separately from the data package
Date of sample collection included?	x			6/3/11
Date of sample digestion included?	x			6/13/11, 6/14/11 and 6/17/11
Holding time to digestion met criteria? Soils -30 days from collection to digestion.	x			See table below "Holding Times"
Date of analysis included?	x			Aqs 6/4/11 @ 0947. Soils 6/14/11, 6/16/11 and 6/17/11
Holding time to analysis met criteria? Soils -168 hours from digestion to analysis. Aqueous – 24 hours from collection to analysis.	x			See table below "Holding Times"
Method reference included?	x			3060A/7196A
Laboratory Case Narrative included?	x			
Definitions: MDL – Method Detection Limit; %R – Percent Recovery; RL – Reporting Limit; RPD – Relative Percent Difference; RSD – Relative Standard Deviation :Corr – Correlation Coefficient.				
Comments				
Field Duplicates: Not applicable for this SDG				

Sample dilutions: EF-B57-12.0(2x), EF-B57-17.0(5x)

ITEM	YES	NO	N/A	COMMENTS
Initial Calibration Documentation Included in Lab Package?	x			Cal source (aqs WThcrIM2-00023) (soils WThcrIM 00024)
1. Blank plus 4 standards (7196A) or blank plus 3 standards (7199), 2. Correlation coefficient of ≥ 0.995 (7196A) or ≥ 0.999 (7199). 3. Calibrate daily or each time instrument is set up.	x			1. Each analysis 1 blank and 5 cal STDs 2. All analyses meet CC 3. Yes
Calibration Check Standard (CCS) for 7196A and Quality Control Sample (QCS) for 7199 Included in Lab Package?	x			Check source (aqs WThcrIM4-00024) (soils WThcrIM3-00011)
1. %R criteria met? (90 - 110%). 2. Correct frequency of once every 10 samples 3. CCS and QCS from independent source and at mid level of calibration curve.	x			1. All met %R 2. Analyzed at least every 10 samples 3. Yes
Calibration Blanks	x			Aqs – 460-75647/1 and Soils 460-76729/1, 460-77009/1, and 460-77134/1.
1. Analyzed prior to initial calibration standards and after each CCS/QCS? 2. Absolute value should not exceed MDL.	x			1. Yes 2. Yes
Method Blank and Field Blanks Included in Lab Package?	x			Field blank included with this SDG EB-060311 and was nondetect.
1. Method blank analyzed with each preparation batch? 2. Absolute value should not exceed MDL.	x			1. Yes, aqs – 460-75647/9. Soils – 460-76582/1-A, 460-76687/1-A, and 460-77081/1-A 2. Yes, all blanks were < MDL.
Eh and pH data.	x			
Eh and pH data was included and plotted for all samples?	x			
Soluble Matrix Spike Data Included in Lab Package?	x			460-27221-2 (ICO-21-2.0) and 460-27297-1 (ICO-14-10.0) from SDG 460-27297.
1. %R criteria met? (75-125%R). 2. Was the spike concentration 40 mg/Kg? 3. Was a sample spiked at the frequency of 1/batch or 20 samples?	x	x*		1. Yes, batch 76729 = 79%. No, batch 77009 = 4% and reanalysis batch 77134 = 9%. 2. No, batch 76729 = 50.3 mg/kg; batch 77009 and reanalysis batch 77134 = 51.5 mg/kg. 3. Yes for all batches.
Insoluble Matrix Spike Data Included in Lab Package?	x			460-27221-2 (ICO-21-2.0) and 460-27297-1 (ICO-14-10.0) from SDG 460-27297.
1. %R criteria met? (75-125%R). 2. Was the spike concentration 400 to 800 mg/Kg? 3. Was a sample spiked at the frequency of 1/batch or 20 samples?	x	x*		1. Yes, batch 76729 = 87%. No, batch 77009 = 52% and reanalysis batch 77134 = 51%. 2. No, batch 76729 = 890 mg/kg; batch 77009 and reanalysis batch 77134 = 912 mg/kg. 3. Yes for all batches.
Post Digestion Spike	x			460-27221-2 (ICO-21-2.0) and 460-27297-1 (ICO-14-10.0) from SDG 460-27297.
1. %R criteria met? (85-115%R). 2. Was the spike concentration 40 mg/Kg or twice the sample concentration? 3. Was a sample spiked at the frequency of 1/batch or 20 samples?	x			1. Yes, batch 76729 = 100%; batch 77009 = 99% and batch 77134 = 101%. 2. Yes, samples were spiked greater than 2x sample concentration. 3. Yes for all batches.
Sample Duplicate Data Included in Lab Package?	x			460-27221-2 (ICO-21-2.0) and 460-27297-1 (ICO-14-10.0) from SDG 460-27297.
1. RPD criteria met? (RPD < 20%) of both results are $\geq 4x$ RL or control limit of $\pm RL$ if both results are $< 4x$ RL. 2. Was a sample spiked at the frequency of 1/batch or 20 samples?	x			1. All criteria were met
Was a Laboratory Control Sample (LCS) Included in Lab Package?	x			
1. %R criteria met? (80-120%R). 2. Was an LCS analyzed at the frequency of 1/batch or 20 samples?	x			1. Yes 2. Yes
Miscellaneous Items.				
1. For soils by 7196A, was the pH within a range of 7.0-8.0? 2. For soils by 7199, was the pH within a range of 9.0-9.5? 3. For aqueous by 7196A, was the pH with a range of 1.5-2.5? 4. For soils (3060A), was the digestion temperature 90-95°C for at least 60 minutes? 5. For 7199, was each sample injected twice and was the RPD ≤ 20 ?	x			1. Yes 2. NA 3. Yes 4. Yes 5. NA

Holding Times

Sample ID	Method	Days from Sampling to Prep	Days from Prep to Analysis	Days from Sampling to Analysis	Sampling to Prep Status	Prep to Analysis Status	Sampling to Analysis Status
EB060311	SW7196			1			OK @1 days
EF-B57-12.0	SW7196	10	1	11	OK @30 days	OK @7 days	OK @37 days
EF-B57-17.0	SW7196	10	1	11	OK @30 days	OK @7 days	OK @37 days
EF-B57-20.0	SW7196	11	2	13	OK @30 days	OK @7 days	OK @37 days
EF-B57-20.0	SW7196	14	0	14	OK @30 days	OK @7 days	OK @37 days

SDG#: 460-27221
Batch 76729
 Cr+6 ICAL -06/14/11
 Soils
 (p. 681 of data pkg)

x - concentration	y - response
0	0
50	0.04
100	0.08
500	0.395
750	0.597
1250	0.963

(p. 681 of data pkg)

AECOM Calculated Intercept	-4.735	OK	Reported intercept	-4.735
AECOM Slope	1291	OK	Reported Slope	1291
AECOM Calculated r	1.000	OK	Reported r	1.000

LCS calculation **LCSS 460-76582/2-A pg. 708**

LCS Soluble Instrument Response	0.361			
Instrument Concentration (ug/L)	461.244			
Sample weight	2.5			
Percent solids	1			
Dilution Factor	1			
AECOM Calculated LCS Result (mg/Kg)	18.45	OK	Reported Result (mg/Kg)	18.45

%R = Found/True*100 **pg. 622 of data pkg**

True Value (mg/kg)	19.8			
AECOM Calculated %R	93.2	OK rounding	Reported %R	93

MS calculation **p. 708 ICO-21-2.0 (27221-2)**

MS Insoluble Instrument Response	0.244			
Instrument Concentration (ug/L)	310.220			
Sample weight (g)	2.5			
Percent solids	0.796			
Dilution Factor	50			
AECOM Calculated MS Result (mg/Kg)	779.4	OK rounding	Reported Result (mg/Kg)	780

%R = Found/True*100 **pg. 616 of data pkg**

True Value (mg/kg)	890			
Native concentration (g)	2.8			
%R	87.3	OK rounding	Reported %R	87

Percent Solids **pg. 724 ICO-21-2.0 (27221-2)**

Empty dish weight=	0.99			
Wet weight=	6.32			
Dry weight=	5.23			
AECOM%solids =	79.5	OK rounding	TestAmerica reported %solids=	79.6

EF-B57-12.0 (27221-17)		pg. 709 of data pkg	
Background reading	0		
Total absorbance	0.901		
Total absorbance - background	0.901		
Instrument Response (µg/L)	1158.277		
Sample weight (g)	2.57		
Final Volume (mL)	100		
Percent solids	0.811		
Dilution Factor	2		
AECOM Calculated Result (mg/Kg)	111.1	OK rounding	Reported Result (mg/Kg) 111.0

EF-B57-17.0 (27221-20)		pg. 709 of data pkg	
Background reading	0		
Total absorbance	0.399		
Total absorbance - background	0.399		
Instrument Response (µg/L)	510.294		
Sample weight (g)	2.52		
Final Volume (mL)	100		
Percent solids	0.797		
Dilution Factor	5		
AECOM Calculated Result (mg/Kg)	127.0	OK	Reported Result (mg/Kg) 127.0

SDG#: 460-27297
Batch 77009 (initial batch)
 Cr+6 ICAL -06/16/11
 Soils
 (p. 687 of data pkg)

x - concentration	y - response
0	0
50	0.042
100	0.082
500	0.397
750	0.597
1250	0.985

(p. 687 of data pkg)

AECOM Calculated Intercept	-3.155	OK	Reported intercept	-3.155
AECOM Slope	1269	OK	Reported Slope	1269
AECOM Calculated r	1.000	OK	Reported r	1.000

EF-B57-20.0 (27221-22) (p. 712 of data pkg)

Background reading	0			
Total absorbance	0.842			
Total absorbance - background	0.842			
Instrument Response (µg/L)	1065.433			
Sample weight (g)	2.48			
Final Volume (mL)	100			
Percent solids	0.92			
Dilution Factor	1			
AECOM Calculated Result (mg/Kg)	46.7	OK	Reported Result (mg/Kg)	46.7

LCS calculation LCSS 460-76687/2-A pg. 712

LCS Soluble Instrument Response	0.369			
Instrument Concentration (ug/L)	465.145			
Sample weight	2.5			
Percent solids	1			
Dilution Factor	1			
AECOM Calculated LCS Result (mg/Kg)	18.6	OK	Reported Result (mg/Kg)	18.6

%R = Found/True*100 pg. 622 of data pkg

True Value (mg/kg)	19.8			
AECOM Calculated %R	94.0	OK	Reported %R	94

MS calculation p. 712 ICO-14-10.0 (27297-1) Batch QC from SDG 460-27297

MS Insoluble Instrument Response	0.148			
Instrument Response (µg/L)	184.672			
Sample weight (g)	2.5			
Percent solids	0.777			
Dilution Factor	50			
AECOM Calculated MS Result (mg/Kg)	475.3	OK rounding	Reported Result (mg/Kg)	475.6

%R = Found/True*100 pg. 616 of data pkg

True Value (mg/kg)	912			
Native concentration (g)	0			
%R	52.1	OK rounding	Reported %R	52

Percent Solids pg. 724 EF-B57-20.0 (27221-22)

Empty dish weight=	1.03			
Wet weight=	6.90			
Dry weight=	6.43			
AECOM%solids =	92.0	OK	Test America reported %solids=	92.0

AECOM

EF-B57-20.0 (27221-22)

pg. 712 of data pkg

Low Standard	50		
Initial weight (g)	2.48		
Final volume (mL)	100		
Percent solids	0.92		
Dilution Factor	1.00		
Reporting Limit	2.2	OK	Reported RL (mg/Kg)= 2.2

Attachment C

Additional Documentation



THE LEADER IN ENVIRONMENTAL TESTING

777 New Durham Road
Edison, New Jersey 08817
Phone: (732) 549-3900 Fax: (732) 549-3679

CHAIN OF CUSTODY / ANALYSIS REQUEST

Page 1 of 3

Name (for report and invoice) CARIN DE JESUS		Samplers Name (Printed) DC / AS		Site/Project Identification 60154 801.0004							
Company AECOM		P. O. # 27 90 60 ALM		State (Location of site): NJ: <input checked="" type="checkbox"/> NY: <input type="checkbox"/> Other:							
Address 2 TECHNOLOGY PARK DRIVE		Analysis Turnaround Time Standard <input checked="" type="checkbox"/>		ANALYSIS REQUESTED (ENTER 'X' BELOW TO INDICATE REQUEST)							
City WESTFORD		Rush Chrges Authorized For: 2 Week <input type="checkbox"/> 1 Week <input type="checkbox"/> Other <input type="checkbox"/>									
State MA		Phone 978.589.3407		Fax 978-589-3282							
LAB USE ONLY Project No:		Job No: 27221		Sample Numbers							
Sample Identification	Date	Time	Matrix	No. of Cont.	CR+U	EH	PH	SVOC			
100-B21-0.5	02/JUN/11	10.00	SO	1	X	X	X				1
100-B21-2.0	03/JUN/11	10.20	SO	3	X	X	X				2
100-B21-4.0	03/JUN/11	11.15	SO	1	X	X	X				3
100-B22-0.5	03/JUN/11	12.10	SO	1	X	X	X				4
100-B22-2.0	03/JUN/11	12.50	SO	1	X	X	X				5
100-B22-4.1	03/JUN/11	13.30	SO	1	X	X	X				6
EF-B66-6.0	03/JUN/11	0940	SO	1				X			7
100-21-6.0	03/JUN/11	1154	SO	1	X	X	X				8
100-21-8.0	03/JUN/11	1201	SO	1	X	X	X				9
100-21-10.0	03/JUN/11	1207	SO	1	X	X	X				10
Preservation Used: 1 = ICE, 2 = HCl, 3 = H ₂ SO ₄ , 4 = HNO ₃ , 5 = NaOH				Soil:		/ / /					
6 = Other _____, 7 = Other _____				Water:							

Special Instructions

Water Metals Filtered (Yes/No)?

Relinquished by <i>Ann M. Schlegel</i>	Company AECOM	Date / Time 03/JUN/11 1050	Received by <i>AS</i>	Company TA. 6/3 1650
Relinquished by	Company	Date / Time	Received by	Company
2)			2)	
Relinquished by	Company	Date / Time	Received by	Company
			2)	

777 New Durham Road
 Edison, New Jersey 08817
 Phone: (732) 549-3900 Fax: (732) 549-3679



THE LEADER IN ENVIRONMENTAL TESTING

CHAIN OF CUSTODY / ANALYSIS REQUEST

Page 2 of 3

Name (for report and invoice) CARYN DEJESUS		Samplers Name (Printed) ANNE SALAZAR DAN CHAMBERLAND		Site/Project Identification 60154801-0004						
Company AECOM		P. O. # 2790 ACM		State (Location of site): NJ: <input checked="" type="checkbox"/> NY: <input type="checkbox"/> Other: <input type="checkbox"/>						
Address 2 TECHNOLOGY PARK DR		Analysis Turnaround Time Standard <input checked="" type="checkbox"/>		ANALYSIS REQUESTED (ENTER 'X' BELOW TO INDICATE REQUEST)				LAB USE ONLY Project No:		
City WESTFORD State MA		Rush Chrges Authorized For: 2 Week <input type="checkbox"/> 1 Week <input type="checkbox"/> Other <input type="checkbox"/>						Job No: 27221		
Phone 978-589-3407 / 978-589-3282								Sample Numbers		
Sample Identification	Date	Time	Matrix	No. of Cont.	Crt6	eH, pH				
IC0-21-12.0	6/3/11	1210	SO	1	X	X			11	
IC0-21-16.0	6/3/11	1221	SO	1	X	X			12	
IC0-21-18.0	6/3/11	1227	SO	1	X	X			13	
IC0-22-6.0	6/3/11	1345	SO	1	X	X			14	
IC0-22-8.0	6/3/11	1350	SO	1	X	X			15	
IC0-22-10.0	6/3/11	1353	SO	1	X	X			16	
EF-B57-12.0	6/3/11	1358	SO	1	X	X			17	
IC0-22-14.0	6/3/11	1400	SO	1	X	X			18	
IC0-22-16.0	6/3/11	1404	SO	1	X	X			19	
EF-B57-17.0	6/3/11	1407	SO	1	X	X			20	
Preservation Used: 1 = ICE, 2 = HCl, 3 = H ₂ SO ₄ , 4 = HNO ₃ , 5 = NaOH 6 = Other _____, 7 = Other _____				Soil:	1	1				
				Water:						

Special Instructions

Water Metals Filtered (Yes/No)?

Relinquished by <i>Anne Salazar</i>	Company AECOM	Date / Time 03/02/11 1050	Received by <i>AS</i>	Company TR - 6/3 1650
Relinquished by	Company	Date / Time	Received by	Company
2)			2)	
Relinquished by	Company	Date / Time	Received by	Company



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Edison, New Jersey 08817
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CHAIN OF CUSTODY / ANALYSIS REQUEST

Page 3 of 3

Name (for report and invoice) CARYN DEJESUS		Samplers Name (Printed) ANNE SALAZAR DAN CHAMBERLAND		Site/Project Identification 60154801.0004	
Company AECOM		P. O. # 2790 ACM		State (Location of site): NJ: <input checked="" type="checkbox"/> NY: <input type="checkbox"/> Other:	
Address 2 TECHNOLOGY PARK DRIVE		Analysis Turnaround Time Standard <input checked="" type="checkbox"/>		ANALYSIS REQUESTED (ENTER 'X' BELOW TO INDICATE REQUEST)	
City WESTFORD State MA		Rush Charges Authorized For: 2 Week <input type="checkbox"/> 1 Week <input type="checkbox"/> Other <input type="checkbox"/>			
Phone 978-589-7907/978-589-3282 Fax				LAB USE ONLY	
				Project No:	
				Job No: 27221	
				Sample Numbers	
Sample Identification	Date	Time	Matrix	No. of Cont.	
LCO-22-19.0	6/3/11	1410	SO	1	21
EF-857-20.0	6/3/11	1418	SO	1	22
FB0603204	6/3/11	1410	AR	4	23
Preservation Used: 1 = ICE, 2 = HCl, 3 = H ₂ SO ₄ , 4 = HNO ₃ , 5 = NaOH		Soil:			
6 = Other _____, 7 = Other _____		Water:			

Special Instructions

Water Metals Filtered (Yes/No)?

Relinquished by <i>[Signature]</i>	Company AECOM	Date / Time 05/20/11 1050	Received by <i>[Signature]</i>	Company TR	6/3 No
Relinquished by 2)	Company	Date / Time	Received by 2)	Company	
Relinquished by	Company	Date / Time	Received by	Company	

Data Validation Report

Project	PPG –ICO	Page	1
Laboratory	Test America, NJ		
Laboratory Job No.:	460-27297		
Analysis/Method:	Hexavalent Chromium SW846 3060A/7196A (including pH and Eh)		
Validation Level:	Full		
Site Location/Address:	Garfield Avenue Soil RI, Site 114, Jersey City, NJ		
AECOM Project Number:	60158739-0007		
Prepared by: Justin Webster/AECOM	Completed on: June 29, 2011		
Reviewed by: Lisa Krowitz/AECOM	File Name: 2011-06-29 Hex Cr DV Report ICO 460-27297-F.docx		

Introduction

The results of quality control data analyzed with site samples were used to assess the overall reliability of the data. The following qualifiers were used to identify data quality issues:

- U: Indicates the analyte was not detected in the sample above the sample reporting limit.
- J: Indicates the result was an estimated value; the associated numerical value was an approximate concentration of the analyte in the sample.
- UJ: Indicates the analyte was not detected above the reporting limit and the reporting limit was approximate.
- R: The sample result was rejected due to serious deficiencies; the presence or absence of the analyte could not be confirmed.

Sample Information

The samples listed below were collected by AECOM on June 6, 2011 as part of the ICO sampling task at PPG Site 114, Jersey City, New Jersey.

Field ID	Laboratory ID	Matrix	Fraction
ICO-14-10.0	460-27297-1	Soil	Hexavalent Chromium
ICO-14-6.0	460-27297-2	Soil	Hexavalent Chromium
ICO-14-16.0	460-27297-3	Soil	Hexavalent Chromium
ICO-14-12.0	460-27297-4	Soil	Hexavalent Chromium
ICO-14-18.5	460-27297-5	Soil	Hexavalent Chromium
ICO-20-6.0	460-27297-6	Soil	Hexavalent Chromium
ICO-14-2.0	460-27297-11	Soil	Hexavalent Chromium
ICO-14-2.0X (field duplicate)	460-27297-12	Soil	Hexavalent Chromium
ICO-14-0.5	460-27297-13	Soil	Hexavalent Chromium
ICO-14-4.0	460-27297-14	Soil	Hexavalent Chromium
ICO-20-0.5	460-27297-15	Soil	Hexavalent Chromium
ICO-20-2.0	460-27297-16	Soil	Hexavalent Chromium
ICO-20-4.0	460-27297-17	Soil	Hexavalent Chromium
EB060611 (field blank)	460-27297-19	Aqueous	Hexavalent Chromium

The samples were collected following the procedures detailed in the NJDEP – Approved Remedial Investigation Work Plan – Soil Non-Residential Chromate Chemical Production Waste Sites 114, 132, 133, 135, 137, 143, and 186 (March 2011).

General Comments

The data package was complete. Quality control (QC) issues identified during validation are discussed below. Refer to the Soil and Aqueous Target Analyte Summary Hit List for a listing of all detected results, qualified results, and associated qualifications, where applicable.

Matrix Spike Results

Soil sample 460-27297-1 (ICO-14-10.0) was selected for soluble and insoluble matrix spike analysis for batch 77009. The initial analysis (batch 77009) soluble and insoluble matrix spike recoveries were 4% and 52%, respectively, which did not meet quality control criteria of 75-125%R. The post spike result for the initial analysis (batch 77009) was recovered at 99%. Since the initial soluble and insoluble matrix spike recoveries did not meet acceptable criteria, the laboratory performed a re-extraction and re-analysis for all samples associated with this SDG under a new batch (77134).

The re-analysis (batch 77134) soluble and insoluble matrix spike recoveries were 9% and 51%, which again did not meet the quality control criteria of 75-125%R. The post spike result for the re-analysis (77134) was recovered at 107%, which again met the quality control criteria of 85-115%.

Since the re-analysis soluble and insoluble matrix spikes again failed to meet quality control criteria, additional parameters were analyzed to determine if possible matrix interferences could be the cause for the poor soluble and insoluble matrix spike recoveries. The samples were tested for pH and oxidative reduction potential (ORP) and plotted on an Eh/pH phase diagram chart. From this chart, the source sample 460-27297-1 (ICO-14-10.0) indicated a slightly oxidizing environment capable of supporting Cr(VI). Thus, the hexavalent chromium results for all soil samples in this SDG were reported from the initial analysis (batch 77009) since the MS %Rs from the reanalysis showed no significant improvement. However, due to the oxidizing conditions in the sample matrix, the soil hexavalent chromium results for all samples reported in this SDG were qualified as estimated (J/UJ) due to the low MS %Rs which varied from 4% to 52%.

Laboratory Duplicate Results

Sample 460-27297-1 (ICO-14-10.0) was selected as the laboratory duplicate sample associated with the samples in this data set. However, the relative percent differences (RPD) results for the initial analysis (batch 77009) and re-analysis (batch 77134) were not calculable due to a nondetect result in the original and duplicate analyses. No data qualifications were required.

Field Duplicate Results

Sample 460-27297-12 (ICO-14-2.0X) was selected as the field duplicate sample associated with the samples in this data set. However, the relative percent differences (RPD) results for the initial analysis (batch 77009) and re-analysis (batch 77134) were not calculable due to a nondetect result in the original and duplicate analyses. No data qualifications were required.

Equipment Blank Contamination

Hexavalent chromium was detected in the equipment blank EB-060611 at a concentration of 2.9 µg/L which was above the MDL (1.5 µg/L), but below the RL (10 µg/L). However, reported soil results were not impacted since the detected results and the reporting limits for the nondetect results were greater than the blank action level of ten times the amount found in the associated equipment blank (29 µg/L).

Data Quality and Recommendations

In general, these data appear to be valid as reported by the laboratory and may be used for decision making purposes. No data were rejected. Qualified results were discussed in Attachments A and B below.

Attachments

Attachment A Target Analyte Summary Hitlist(s)

Attachment B Data Validation Report Form

Attachment A

Target Analyte Summary Hitlist(s)

Soil Target Analyte Summary Hit List

Site Name PPG ICO Site 114, Jersey City, NJ
Sampling Date June 6, 2011
Lab Name/ID TestAmerica, Edison, NJ
SDG No 460-27297
Sample Matrix Soil
Trip Blank ID NA
Field Blank ID EB060611

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
ICO-14-0.5	460-27297-13	CHROMIUM (HEXAVALENT)	U	2.8	2.8	2.3	Qualify	18
ICO-14-10.0	460-27297-1	CHROMIUM (HEXAVALENT)	U	U	U	2.6	Qualify	20
ICO-14-12.0	460-27297-4	CHROMIUM (HEXAVALENT)	U	U	U	2.6	Qualify	20
ICO-14-16.0	460-27297-3	CHROMIUM (HEXAVALENT)	U	U	U	2.7	Qualify	20
ICO-14-18.5	460-27297-5	CHROMIUM (HEXAVALENT)	U	U	U	2.4	Qualify	20
ICO-14-2.0	460-27297-11	CHROMIUM (HEXAVALENT)	U	U	U	2.4	Qualify	20
ICO-14-2.0X	460-27297-12	CHROMIUM (HEXAVALENT)	U	U	U	2.4	Qualify	20
ICO-14-4.0	460-27297-14	CHROMIUM (HEXAVALENT)	U	U	U	2.2	Qualify	20
ICO-14-6.0	460-27297-2	CHROMIUM (HEXAVALENT)	U	U	U	3.2	Qualify	20
ICO-20-0.5	460-27297-15	CHROMIUM (HEXAVALENT)	U	U	U	2.6	Qualify	20
ICO-20-2.0	460-27297-16	CHROMIUM (HEXAVALENT)	U	U	U	2.6	Qualify	20
ICO-20-4.0	460-27297-17	CHROMIUM (HEXAVALENT)	U	U	U	3.1	Qualify	20
ICO-20-6.0	460-27297-6	CHROMIUM (HEXAVALENT)	U	U	U	2.4	Qualify	20

Note: The "U" under Method Blank column indicates a nondetect result.

The "U" under the Laboratory Sample Result and Validation Sample Result columns indicate a nondetect result at the RL.

NJDEP Validation Footnote

18. The reported value was qualified (J) because the redigestion spike recovery was less than 75 percent

20. The nondetect value was qualified (UJ) because the redigestion spike recovery was less than 75 percent. The possibility of a false negative exists.

Aqueous Target Analyte Summary Hit List

Site Name PPG ICO Site 114, Jersey City, NJ
Sampling Date June 6, 2011
Lab Name/ID Test America, Edison, NJ
SDG No 460-27297
Sample Matrix Soil
Trip Blank ID NA
Field Blank ID EB060611

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
EB060611	460-27297-19	CHROMIUM (HEXAVALENT)	U	2.9	2.9	10.0	Qualify	13

Note: The "U" under Method Blank column indicates a nondetect result.
 The "U" under the Laboratory Sample Result and Validation Sample Result columns indicate a nondetect result at the RL.

NJDEP Validation Footnote

13. The reported analyte was qualified because the result was greater than the MDL but below the RL.

Attachment B

Data Validation Report Form

Client Name: PPG Industries	Project Number: 60154801-0007
Site Location: PPG- ICO	Project Manager: Robert Cataldo
Laboratory: TestAmerica, New Jersey	Limited or <u>Full Validation</u> (circle one)
Laboratory Job No: 460-27297	Date Checked: 6/28/2011
Validator: Justin Webster	Peer: Lisa Krowitz

ITEM	YES	NO	N/A	COMMENTS
Sample results included?	x			1 Aqs TB and 14 Soils
Reporting Limits met project requirements?	x			Soils - 2.2 mg/kg to 3.2 mg/kg
Field I.D. included?	x			
Laboratory I.D. included?	x			
Sample matrix included?	x			
Sample receipt temperature 2-6°C?	x			5.3°C
Signed COCs included?	x			
Date of sample collection included?	x			6/6/11
Date of sample digestion included?	x			6/14/11 and 6/17/11
Holding time to digestion met criteria? Soils -30 days from collection to digestion.	x			See table below "Holding Times"
Date of analysis included?	x			Aqs 6/7/11 @ 0746. Soils 6/16/11 and 6/17/11
Holding time to analysis met criteria? Soils -168 hours from digestion to analysis. Aqueous – 24 hours from collection to analysis.	x			See table below "Holding Times"
Method reference included?	x			3060A/7196A
Laboratory Case Narrative included?	x			

Definitions: MDL – Method Detection Limit; %R – Percent Recovery; RL – Reporting Limit; RPD – Relative Percent Difference; RSD – Relative Standard Deviation :Corr – Correlation Coefficient.

Comments

Field Duplicates:

ICO-14-2.0 (mg/kg)	ICO-14-2.0X (mg/kg)	RPD% (mg/kg)
2.4 U	2.4 U	NC due to nondetect initial and duplicate results

Sample dilutions: No sample dilutions were performed for this SDG.

ITEM	YES	NO	N/A	COMMENTS
Initial Calibration Documentation Included in Lab Package?	x			Cal source (aqs WThcrIM2-00023) (soil WThcrIM 00024)
1. Blank plus 4 standards (7196A) or blank plus 3 standards (7199), 2. Correlation coefficient of ≥ 0.995 (7196A) or ≥ 0.999 (7199). 3. Calibrate daily or each time instrument is set up.	x			1. Each analysis 1 blank and 5 cal STDs 2. All analyses meet CC 3. Yes
Calibration Check Standard (CCS) for 7196A and Quality Control Sample (QCS) for 7199 Included in Lab Package?	x			Check source (aqs WThcrIM4-00024) (soils WThcrIM3-00011)
1. %R criteria met? (90 - 110%). 2. Correct frequency of once every 10 samples 3. CCS and QCS from independent source and at mid level of calibration curve.	x			1. All met %R 2. Analyzed at least every 10 samples 3. Yes
Calibration Blanks	x			Aqs – 460-75848/1 and Soils 460-77009/1, and 460-77134/1.
1. Analyzed prior to initial calibration standards and after each CCS/QCS? 2. Absolute value should not exceed MDL.	x			1. Yes 2. Yes
Method Blank and Field Blanks Included in Lab Package?	x			Field blank included with this SDG EB-060611 and was estimated (J) greater than the MDL but less the RL.
1. Method blank analyzed with each preparation batch? 2. Absolute value should not exceed MDL.		x		1. Yes, aqs – 460-75848/9. Soils –460-76687/1-A, and 460-77081/1-A 2. Yes, all MBs were < MDL. The associated field blank was > MDL but < RL.
Eh and pH data.	x			
Eh and pH data was included and plotted for all samples?	x			
Soluble Matrix Spike Data Included in Lab Package?	x			460-27297-1 (ICO-14-10.0)
1. %R criteria met? (75-125%R). 2. Was the spike concentration 40 mg/Kg? 3. Was a sample spiked at the frequency of 1/batch or 20 samples?		x		1. No, batch 77009 = 4% and reanalysis batch 77134 = 9%. 2. No, batch 77009 and reanalysis batch 77134 = 51.5 mg/kg. 3. Yes for all batches.
Insoluble Matrix Spike Data Included in Lab Package?	x			460-27297-1 (ICO-14-10.0)
1. %R criteria met? (75-125%R). 2. Was the spike concentration 400 to 800 mg/Kg? 3. Was a sample spiked at the frequency of 1/batch or 20 samples?		x		1. No, batch 77009 = 52% and reanalysis batch 77134 = 51%. 2. No, batch 77009 and reanalysis batch 77134 = 912 mg/kg. 3. Yes for all batches.
Post Digestion Spike	x			460-27297-1 (ICO-14-10.0)
1. %R criteria met? (85-115%R). 2. Was the spike concentration 40 mg/Kg or twice the sample concentration? 3. Was a sample spiked at the frequency of 1/batch or 20 samples?	x			1. Yes, batch 77009 = 99% and batch 77134 = 101%. 2. Yes, samples were spiked greater than 2x sample concentration. 3. Yes for all batches.
Sample Duplicate Data Included in Lab Package?	x			460-27297-1 (ICO-14-10.0)
1. RPD criteria met? (RPD < 20%) of both results are $\geq 4x$ RL or control limit of $\pm RL$ if both results are <4x RL. 2. Was a sample spiked at the frequency of 1/batch or 20 samples?	x			1. The relative percent difference (RPD) for the laboratory duplicate sample ICO-14-10.0 was not calculated for the initial and reanalysis due to nondetect sample results.
Was a Laboratory Control Sample (LCS) Included in Lab Package?	x			
1. %R criteria met? (80-120%R). 2. Was an LCS analyzed at the frequency of 1/batch or 20 samples?	x			1. Yes 2. Yes
Miscellaneous Items.				
1. For soils by 7196A, was the pH within a range of 7.0-8.0? 2. For soils by 7199, was the pH within a range of 9.0-9.5? 3. For aqueous by 7196A, was the pH with a range of 1.5-2.5? 4. For soils (3060A), was the digestion temperature 90-95°C for at least 60 minutes? 5. For 7199, was each sample injected twice and was the RPD ≤ 20 ?	x			1. Yes 2. NA 3. Yes 4. Yes 5. NA

Holding Times

Sample ID	Method	Days from Sampling to Prep	Days from Prep to Analysis	Days from Sampling to Analysis	Sampling to Prep Status	Prep to Analysis Status	Sampling to Analysis Status
EB060611	SW7196			1			OK @1 days
ICO-14-0.5	SW7196	8	2	10	OK @30 days	OK @7 days	OK @37 days
ICO-14-0.5	SW7196	11	0	11	OK @30 days	OK @7 days	OK @37 days
ICO-14-10.0	SW7196	8	2	10	OK @30 days	OK @7 days	OK @37 days
ICO-14-10.0	SW7196	11	0	11	OK @30 days	OK @7 days	OK @37 days
ICO-14-12.0	SW7196	8	2	10	OK @30 days	OK @7 days	OK @37 days
ICO-14-12.0	SW7196	11	0	11	OK @30 days	OK @7 days	OK @37 days
ICO-14-16.0	SW7196	8	2	10	OK @30 days	OK @7 days	OK @37 days
ICO-14-16.0	SW7196	11	0	11	OK @30 days	OK @7 days	OK @37 days
ICO-14-18.5	SW7196	8	2	10	OK @30 days	OK @7 days	OK @37 days
ICO-14-18.5	SW7196	11	0	11	OK @30 days	OK @7 days	OK @37 days
ICO-14-2.0	SW7196	8	2	10	OK @30 days	OK @7 days	OK @37 days
ICO-14-2.0	SW7196	11	0	11	OK @30 days	OK @7 days	OK @37 days
ICO-14-2.0X	SW7196	8	2	10	OK @30 days	OK @7 days	OK @37 days
ICO-14-2.0X	SW7196	11	0	11	OK @30 days	OK @7 days	OK @37 days
ICO-14-4.0	SW7196	8	2	10	OK @30 days	OK @7 days	OK @37 days
ICO-14-4.0	SW7196	11	0	11	OK @30 days	OK @7 days	OK @37 days
ICO-14-6.0	SW7196	8	2	10	OK @30 days	OK @7 days	OK @37 days
ICO-14-6.0	SW7196	11	0	11	OK @30 days	OK @7 days	OK @37 days
ICO-20-0.5	SW7196	8	2	10	OK @30 days	OK @7 days	OK @37 days
ICO-20-0.5	SW7196	11	0	11	OK @30 days	OK @7 days	OK @37 days
ICO-20-2.0	SW7196	8	2	10	OK @30 days	OK @7 days	OK @37 days
ICO-20-2.0	SW7196	11	0	11	OK @30 days	OK @7 days	OK @37 days
ICO-20-4.0	SW7196	8	2	10	OK @30 days	OK @7 days	OK @37 days
ICO-20-4.0	SW7196	11	0	11	OK @30 days	OK @7 days	OK @37 days
ICO-20-6.0	SW7196	8	2	10	OK @30 days	OK @7 days	OK @37 days
ICO-20-6.0	SW7196	11	0	11	OK @30 days	OK @7 days	OK @37 days

SDG#: 460-27297
Batch 77009 (initial calibration)
 Cr+6 ICAL -06/16/11
 Soils
 (p. 543 of data pkg)

x - concentration	y - response
0	0
50	0.042
100	0.082
500	0.397
750	0.597
1250	0.985

(p. 543 of data pkg)

AECOM Calculated Intercept	-3.155	OK	Reported intercept	-3.155
AECOM Slope	1269	OK	Reported Slope	1269
AECOM Calculated r	1.000	OK	Reported r	1.000

ICO-14-10.0 (27297-1) (p. 559 of data pkg)

Background reading	0				
Total absorbance	0.002				
Total absorbance - background	0.002				
Instrument Response (µg/L)	-0.617				
Sample weight (g)	2.5				
Final Volume (mL)	100				
Percent solids	0.777				
Dilution Factor	1				
AECOM Calculated Result (mg/Kg)	0.0	OK sample ND	Reported Result (mg/Kg)	2.6	U

LCS calculation LCSS 460-76687/2-A pg. 559

LCS Soluble Instrument Response	0.369			
Instrument Concentration (ug/L)	465.145			
Sample weight	2.5			
Percent solids	1			
Dilution Factor	1			
AECOM Calculated LCS Result (mg/Kg)	18.6	OK	Reported Result (mg/Kg)	18.6

%R = Found/True*100 pg. 493 of data pkg

True Value (mg/kg)	19.8			
AECOM Calculated %R	94.0	OK	Reported %R	94

MS calculation p. 559 ICO-14-10.0 (27297-1)

MS Insoluble Instrument Response	0.148			
Instrument Response (µg/L)	184.672			
Sample weight (g)	2.5			
Percent solids	0.777			
Dilution Factor	50			
AECOM Calculated MS Result (mg/Kg)	475.3	OK rounding	Reported Result (mg/Kg)	475.6

%R = Found/True*100 pg. 487 of data pkg

True Value (mg/kg)	912			
Native concentration (g)	0			
%R	52.1	OK rounding	Reported %R	52

Percent Solids pg. 571 ICO-14-10.0 (27297-1)

Empty dish weight=	1			
Wet weight=	7.13			
Dry weight=	5.76			
AECOM%solids =	77.7	OK	Test America reported %solids=	77.7

AECOM

ICO-14-10.0 (27297-1)

pg. 559 of data pkg

Low Standard	50
Initial weight (g)	2.5
Final volume (mL)	100
Percent solids	0.78
Dilution Factor	1.00

Reporting Limit	2.6	OK	Reported RL (mg/Kg)=	2.6
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ICO-14-6.0 (27297-2)

pg. 559 of data pkg

Background reading	0.008
Total absorbance	0.012
Total absorbance - background	0.004
Instrument Response (µg/L)	1.921
Sample weight (g)	2.58
Final Volume (mL)	100
Percent solids	0.604
Dilution Factor	1

AECOM Calculated Result (mg/Kg)	0.1	OK sample ND	Reported Result (mg/Kg)	3.2 U
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ICO-14-16.0 (27297-3)

pg. 559 of data pkg

Background reading	0.006
Total absorbance	0.009
Total absorbance - background	0.003
Instrument Response (µg/L)	0.652
Sample weight (g)	2.49
Final Volume (mL)	100
Percent solids	0.732
Dilution Factor	1

AECOM Calculated Result (mg/Kg)	0.0	OK sample ND	Reported Result (mg/Kg)	2.7 U
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ICO-14-12.0 (27297-4)

pg. 559 of data pkg

Background reading	0.005
Total absorbance	0.007
Total absorbance - background	0.002
Instrument Response (µg/L)	-0.617
Sample weight (g)	2.52
Final Volume (mL)	100
Percent solids	0.769
Dilution Factor	1

AECOM Calculated Result (mg/Kg)	0.0	OK sample ND	Reported Result (mg/Kg)	2.6 U
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ICO-14-18.5 (27297-5)

pg. 559 of data pkg

Background reading	0.002
Total absorbance	0.005
Total absorbance - background	0.003
Instrument Response (µg/L)	0.652
Sample weight (g)	2.54
Final Volume (mL)	100
Percent solids	0.813
Dilution Factor	1

AECOM Calculated Result (mg/Kg)	0.03	OK sample ND	Reported Result (mg/Kg)	2.4 U
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ICO-20-6.0 (27297-6)

pg. 559 of data pkg

Background reading	0
Total absorbance	0.005
Total absorbance - background	0.005
Instrument Response (µg/L)	3.190
Sample weight (g)	2.55
Final Volume (mL)	100
Percent solids	0.804
Dilution Factor	1

AECOM Calculated Result (mg/Kg)	0.2	OK sample ND	Reported Result (mg/Kg)	2.4 U
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ICO-14-2.0 (27297-11)

pg. 560 of data pkg

Background reading	0.003
Total absorbance	0.006
Total absorbance - background	0.003
Instrument Response (µg/L)	0.652
Sample weight (g)	2.54
Final Volume (mL)	100
Percent solids	0.833
Dilution Factor	1

AECOM Calculated Result (mg/Kg)	0.0	OK sample ND	Reported Result (mg/Kg)	2.4 U
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ICO-14-2.0X (27297-12)

pg. 560 of data pkg

Background reading	0
Total absorbance	0.004
Total absorbance - background	0.004
Instrument Response (µg/L)	1.921
Sample weight (g)	2.5
Final Volume (mL)	100
Percent solids	0.841
Dilution Factor	1

AECOM Calculated Result (mg/Kg)	0	OK sample ND	Reported Result (mg/Kg)	2.4 U
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ICO-14-0.5 (27297-13)

pg. 560 of data pkg

Background reading	0.004
Total absorbance	0.053
Total absorbance - background	0.049
Instrument Response (µg/L)	59.031
Sample weight (g)	2.54
Final Volume (mL)	100
Percent solids	0.839
Dilution Factor	1

AECOM Calculated Result (mg/Kg)	2.8	OK	Reported Result (mg/Kg)	2.8
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ICO-14-4.0 (27297-14)

pg. 560 of data pkg

Background reading	0
Total absorbance	0.002
Total absorbance - background	0.002
Instrument Response (µg/L)	-0.617
Sample weight (g)	2.56
Final Volume (mL)	100
Percent solids	0.891
Dilution Factor	1

AECOM Calculated Result (mg/Kg)	0	OK sample ND	Reported Result (mg/Kg)	2.2 U
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AECOM

ICO-20-0.5 (27297-15)

pg. 560 of data pkg

Background reading	0.013
Total absorbance	0.019
Total absorbance - background	0.006
Instrument Response (µg/L)	4.459
Sample weight (g)	2.57
Final Volume (mL)	100
Percent solids	0.734
Dilution Factor	1

AECOM Calculated Result (mg/Kg)	0	OK sample ND	Reported Result (mg/Kg)	2.6 U
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ICO-20-2.0 (27297-16)

pg. 560 of data pkg

Background reading	0
Total absorbance	0.008
Total absorbance - background	0.008
Instrument Response (µg/L)	6.997
Sample weight (g)	2.51
Final Volume (mL)	100
Percent solids	0.762
Dilution Factor	1

AECOM Calculated Result (mg/Kg)	0.4	OK sample ND	Reported Result (mg/Kg)	2.6 U
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ICO-20-4.0 (27297-17)

pg. 560 of data pkg

Background reading	0.014
Total absorbance	0.021
Total absorbance - background	0.007
Instrument Response (µg/L)	5.728
Sample weight (g)	2.48
Final Volume (mL)	100
Percent solids	0.656
Dilution Factor	1

AECOM Calculated Result (mg/Kg)	0.4	OK sample ND	Reported Result (mg/Kg)	3.1 U
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Data Validation Report

Project	PPG – GA EF	Page	1
Laboratory	Test America, NJ		
Laboratory Job No.:	460-29620		
Analysis/Method:	Hexavalent Chromium SW846 3060A/7196A (including pH and Eh)		
Validation Level:	Full		
Site Location/Address:	Garfield Avenue Soil RI, Site 114, Jersey City, NJ		
AECOM Project Number:	60154801-0007		
Prepared by: Justin Webster/AECOM	Completed on: August 25, 2011		
Reviewed by: Lisa Krowitz/AECOM	File Name: 2011-08-25 Hex Cr DV Report 460-29620-F.docx		

Introduction

The results of quality control data analyzed with site samples were used to assess the overall reliability of the data. The following qualifiers were used to identify data quality issues:

- U: Indicates the analyte was not detected in the sample above the sample reporting limit.
- J: Indicates the result was an estimated value; the associated numerical value was an approximate concentration of the analyte in the sample.
- UJ: Indicates the analyte was not detected above the reporting limit and the reporting limit was approximate.
- R: The sample result was rejected due to serious deficiencies; the presence or absence of the analyte could not be confirmed.

Sample Information

The samples listed below were collected by AECOM on August 5, 2011 as part of the Garfield Avenue Soil RI sampling task at PPG Site 114, Jersey City, New Jersey.

Field ID	Laboratory ID	Matrix	Fraction
EF-B74-2.5	460-29620-1	Soil	Hexavalent Chromium
EF-B74-6.0	460-29620-2	Soil	Hexavalent Chromium
EF-B74-11.0	460-29620-3	Soil	Hexavalent Chromium
EF-B74-16.5	460-29620-4	Soil	Hexavalent Chromium
EF-B74-22.5	460-29620-5	Soil	Hexavalent Chromium
EF-B73-2.5	460-29620-6	Soil	Hexavalent Chromium
EF-B77-3.0	460-29620-7	Soil	Hexavalent Chromium
EF-B77-4.0	460-29620-8	Soil	Hexavalent Chromium
EF-B77-6.0	460-29620-9	Soil	Hexavalent Chromium
EF-B77-10.0	460-29620-10	Soil	Hexavalent Chromium
EF-B77-15.0	460-29620-11	Soil	Hexavalent Chromium
EF-B77-22.0	460-29620-12	Soil	Hexavalent Chromium
EF-B77-20.0	460-29620-13	Soil	Hexavalent Chromium
EF-B76-2.0	460-29620-14	Soil	Hexavalent Chromium
EB080511 (field blank)	460-29620-15	Soil	Hexavalent Chromium
EF-B77-16.0	460-29620-16	Soil	Hexavalent Chromium

The samples were collected following the procedures detailed in the NJDEP - Approved Remedial Investigation Work Plan – Soil Non-Residential Chromate Chemical Production Waste Sites 114, 132, 133, 135, 137, 143, and 186 (March 2011).

General Comments

The data package was incomplete. Sample EF-B77-16.0 was not initially included on the COC upon receipt at the laboratory, but the laboratory verified that the sample, which was received, was to be analyzed for hexavalent chromium and should have been on the COC. AECOM updated the COC after receipt of the data package from the laboratory. Quality control (QC) issues identified during validation are discussed below. Refer to the Soil Target Analyte Summary Hit List for a listing of all detected results, qualified results, and associated qualifications, where applicable.

Matrix Spike Results

Soil sample EF-B77-10.0 was selected for soluble and insoluble matrix spike analysis. The initial analysis (batch 83480) soluble and insoluble matrix spike recoveries were 11% and 53%, respectively, which did not meet quality control criteria of 75-125%R. The post spike result for the initial analysis (83480) was recovered at 80% which also did not meet the criteria of 85-115%R. Since the initial spike recoveries did not meet acceptable criteria, the laboratory performed a re-extraction and re-analysis for all samples associated with this initial batch 83480 under batch 83564.

The re-analysis (batch 83564) soluble and insoluble matrix spike recoveries were 13% and 48%, respectively, which again did not meet the quality control criteria of 75-125%R. The post spike result for the re-analysis (83564) was recovered at 83%, which again did not meet the quality control criteria of 85-115%R.

Since the re-analysis soluble and insoluble matrix spikes also failed to meet quality control criteria, additional parameters were analyzed to determine if possible matrix interferences could be the cause for the poor matrix spike recoveries. The samples were tested for pH and oxidative reduction potential (ORP) and plotted on an Eh/pH phase diagram chart. From this chart, source sample EF-B77-10.0 for the matrix spike analyses was in very close proximity of the phase change line, which does not provide definitive information indicating if the matrix is oxidizing or reducing. Therefore, the hexavalent chromium results were reported from the initial analysis batch 83480 since the MS %Rs from the

reanalysis showed no improvement and the initial insoluble matrix spike recovery was above 50%R. All soil samples were qualified as estimated (J/UJ) due to the low MS %Rs.

Percent Moisture

Samples EF-B77-16.0 and EF-B77-20.0 had moisture content that exceeded the quality control criteria of greater than 50% moisture. The nondetect results were qualified as estimated (UJ) due to the high percent moisture content.

Laboratory Duplicate Results

Sample EF-B77-10.0 was the laboratory duplicate sample associated with the samples in this data set. The relative percent differences (RPD) result was not calculated since the original and duplicate sample results were reported as nondetect. No data qualifications were required on this basis.

Sample Reporting Limits

Sample EF-B74-6.0 was qualified "J" as estimated by the laboratory. The reported result was less than the reporting limit (RL), but greater than or equal to the method detection limit (MDL) and; therefore, is an approximate value.

Data Quality and Recommendations

In general, these data appear to be valid as reported by the laboratory and may be used for decision making purposes. All the hexavalent chromium data in this SDG were qualified as estimated due to low MS %Rs and/or high moisture content.

Attachments

Attachment A Target Analyte Summary Hitlist(s)

Attachment B Data Validation Report Form

Attachment A

Target Analyte Summary Hitlist(s)

Soil Target Analyte Summary Hit List

Site Name PPG GAEF Site 114, Jersey City, NJ
Sampling Date August 5, 2011
Lab Name/ID Test America, Edison, NJ
SDG No 460-29620
Sample Matrix Soil
Trip Blank ID NA
Field Blank ID EB-080511

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
EF-B73-2.5	460-29620-6	CHROMIUM (HEXAVALENT)	U	U	U	2.5	qualify	20
EF-B74-11.0	460-29620-3	CHROMIUM (HEXAVALENT)	U	U	U	2.3	qualify	20
EF-B74-16.5	460-29620-4	CHROMIUM (HEXAVALENT)	U	U	U	2.4	qualify	20
EF-B74-2.5	460-29620-1	CHROMIUM (HEXAVALENT)	U	5.7	5.7	2.4	qualify	18
EF-B74-22.5	460-29620-5	CHROMIUM (HEXAVALENT)	U	U	U	2.3	qualify	20
EF-B74-6.0	460-29620-2	CHROMIUM (HEXAVALENT)	U	0.75	0.75	2.2	qualify	13,18
EF-B76-2.0	460-29620-14	CHROMIUM (HEXAVALENT)	U	U	U	2.2	qualify	20
EF-B77-10.0	460-29620-10	CHROMIUM (HEXAVALENT)	U	U	U	2.7	qualify	20
EF-B77-15.0	460-29620-11	CHROMIUM (HEXAVALENT)	U	U	U	2.8	qualify	20
EF-B77-16.0	460-29620-16	CHROMIUM (HEXAVALENT)	U	U	U	5.6	qualify	20,22
EF-B77-20.0	460-29620-13	CHROMIUM (HEXAVALENT)	U	U	U	6.3	qualify	20,22
EF-B77-22.0	460-29620-12	CHROMIUM (HEXAVALENT)	U	U	U	2.4	qualify	20
EF-B77-3.0	460-29620-7	CHROMIUM (HEXAVALENT)	U	U	U	2.1	qualify	20
EF-B77-4.0	460-29620-8	CHROMIUM (HEXAVALENT)	U	U	U	2.3	qualify	20
EF-B77-6.0	460-29620-9	CHROMIUM (HEXAVALENT)	U	U	U	3.0	qualify	20

Note: The "U" under Method Blank column indicates a nondetect result.

The "U" under the Laboratory Sample Result and Validation Sample Result columns indicate a nondetect result at the RL.

NJDEP Validation Footnote

13. The reported analyte was qualified (J) because the sample result was greater than the MDL and less than the RL.
18. The reported value was qualified (J) as estimated because the predigestion spike recovery was less than 75 percent.
20. The nondetect value was qualified (UJ) because the predigestion spike recovery was less than 75 percent. The possibility of false negative exists.
22. The reported value was qualified (UJ) because the sample moisture content exceeded 50 percent.

Attachment B

Data Validation Report Form

Client Name: PPG Industries	Project Number: 60154801-0007
Site Location: PPG-GAEF	Project Manager: Robert Cataldo
Laboratory: TestAmerica, New Jersey	Limited or <u>Full Validation</u> (circle one)
Laboratory Job No: 460-29620	Date Checked: 08/23/2011
Validator: Justin Webster	Peer: Lisa Krowitz

ITEM	YES	NO	N/A	COMMENTS
Sample results included?	x			15 Soils and 1 field blank
Reporting Limits met project requirements?	x			Soils - 2.1 mg/kg to 6.3 mg/kg
Field I.D. included?	x			
Laboratory I.D. included?	x			
Sample matrix included?	x			
Sample receipt temperature 2-6°C?	x			5.9°C
Signed COCs included?	x			
Date of sample collection included?	x			08/05/2011
Date of sample digestion included?	x			8/17/11 and 8/19/11
Holding time to digestion met criteria? Soils -30 days from collection to digestion.	x			See below " Holding Times"
Date of analysis included?	x			Aqs 8/6/11 @ 0926. Soils 8/18/11 and 8/19/11
Holding time to analysis met criteria? Soils -168 hours from digestion to analysis. Aqueous – 24 hours from collection to analysis.	x			See Below "Holding Times"
Method reference included?	x			3060A/7196A
Laboratory Case Narrative included?	x			
Definitions: MDL – Method Detection Limit; %R – Percent Recovery; RL – Reporting Limit; RPD – Relative Percent Difference; RSD – Relative Standard Deviation :Corr – Correlation Coefficient.				
Comments				
Field Duplicates: Not applicable for this SDG.				

Sample dilutions: Not applicable for this SDG

ITEM	YES	NO	N/A	COMMENTS
Initial Calibration Documentation Included in Lab Package?	x			Cal source (aqs WThcrIM2-00024) (soil WThcrIM 00027)
1. Blank plus 4 standards (7196A) or blank plus 3 standards (7199), 2. Correlation coefficient of ≥ 0.995 (7196A) or ≥ 0.999 (7199). 3. Calibrate daily or each time instrument is set up.	x			1. Each analysis 1 blank and 5 cal STDs 2. All analyses meet CC 3. Yes
Calibration Check Standard (CCS) for 7196A and Quality Control Sample (QCS) for 7199 Included in Lab Package?	x			Check source (aqs WThcrIM4-00025) (soils WThcrIM3 00012)
1. %R criteria met? (90 - 110%). 2. Correct frequency of once every 10 samples 3. CCS and QCS from independent source and at mid level of calibration curve.	x			1. All met %R 2. Analyzed every 10 samples 3. Yes
Calibration Blanks	x			Aqs – 460-82258/1 and Soils 460-83480/1 and 460-83564/1
1. Analyzed prior to initial calibration standards and after each CCS/QCS? 2. Absolute value should not exceed MDL.	x			1. Yes 2. Yes
Method Blank and Field Blanks Included in Lab Package?	x			Field blank EB080511 was nondetect
1. Method blank analyzed with each preparation batch? 2. Absolute value should not exceed MDL.	x			1. Yes, aqs – 460-82258/9. Soils –460- 83309/1-A and 460-83545/1-A 2. Yes, all MBs and field blank were less than MDL.
Eh and pH data.	x			
Eh and pH data was included and plotted for all samples?	x			
Soluble Matrix Spike Data Included in Lab Package?	x			460-29620-10 (EF-B77-10.0)
1. %R criteria met? (75-125%R). 2. Was the spike concentration 40 mg/Kg? 3. Was a sample spiked at the frequency of 1/batch or 20 samples?		x		1. No, initial batch 83480 = 11% and reanalysis batch 83564 = 13% 2. Yes, batches 83480 and 83564 = 53 mg/kg 3. Yes for all batches.
Insoluble Matrix Spike Data Included in Lab Package?	x			460-29620-10 (EF-B77-10.0)
1. %R criteria met? (75-125%R). 2. Was the spike concentration 400 to 800 mg/Kg? 3. Was a sample spiked at the frequency of 1/batch or 20 samples?		x		1. No, batch 83480 = 53% and reanalysis batch 83564 = 48%. 2. Yes, batch 83480 = 938 mg/kg and batch 83564 = 942 mg/kg. 3. Yes for all batches.
Post Digestion Spike	x			460-29620-10 (EF-B77-10.0)
1. %R criteria met? (85-115%R). 2. Was the spike concentration 40 mg/Kg or twice the sample concentration? 3. Was a sample spiked at the frequency of 1/batch or 20 samples?		x		1. Yes, batch 83480 = 80% and batch 83564 = 83%. 2. Yes, batch 83480 and reanalysis batch 83564 = 53 mg/kg. 3. Yes for all batches
Sample Duplicate Data Included in Lab Package?	x			460-29620-10 (EF-B77-10.0)
1. RPD criteria met? (RPD < 20%) of both results are $\geq 4x$ RL or control limit of $\pm RL$ if both results are $< 4x$ RL. 2.. Was a sample spiked at the frequency of 1/batch or 20 samples?	x			1. The RPDs for batch 83480 and the reanalysis batch 83564 were not calculated due to nondetect results in both the original and duplicate analysis.
Was a Laboratory Control Sample (LCS) Included in Lab Package?	x			
1. %R criteria met? (80-120%R). 2. Was an LCS analyzed at the frequency of 1/batch or 20 samples?	x			1. Yes 2. Yes
Miscellaneous Items.				
1. For soils by 7196A, was the pH within a range of 7.0-8.0? 2. For soils by 7199, was the pH within a range of 9.0-9.5? 3. For aqueous by 7196A, was the pH with a range of 1.5-2,5?	x			1. Yes 2. NA 3. Yes

ITEM	YES	NO	N/A	COMMENTS
4. For soils (3060A), was the digestion temperature 90-95°C for at least 60 minutes? 5. For 7199, was each sample injected twice and was the RPD \leq 20?				4. Yes 5. NA

Holding Times

Sample ID	Method	Days from Sampling to Prep	Days from Prep to Analysis	Days from Sampling to Analysis	Sampling to Prep Status	Prep to Analysis Status	Sampling to Analysis Status
EB080511	SW7196			1			OK @1 days
EF-B73-2.5	SW7196	12	1	13	OK @30 days	OK @7 days	OK @37 days
EF-B73-2.5	SW7196	14	0	14	OK @30 days	OK @7 days	OK @37 days
EF-B74-11.0	SW7196	12	1	13	OK @30 days	OK @7 days	OK @37 days
EF-B74-11.0	SW7196	14	0	14	OK @30 days	OK @7 days	OK @37 days
EF-B74-16.5	SW7196	12	1	13	OK @30 days	OK @7 days	OK @37 days
EF-B74-16.5	SW7196	14	0	14	OK @30 days	OK @7 days	OK @37 days
EF-B74-2.5	SW7196	12	1	13	OK @30 days	OK @7 days	OK @37 days
EF-B74-2.5	SW7196	14	0	14	OK @30 days	OK @7 days	OK @37 days
EF-B74-22.5	SW7196	12	1	13	OK @30 days	OK @7 days	OK @37 days
EF-B74-22.5	SW7196	14	0	14	OK @30 days	OK @7 days	OK @37 days
EF-B74-6.0	SW7196	12	1	13	OK @30 days	OK @7 days	OK @37 days
EF-B74-6.0	SW7196	14	0	14	OK @30 days	OK @7 days	OK @37 days
EF-B76-2.0	SW7196	12	1	13	OK @30 days	OK @7 days	OK @37 days
EF-B76-2.0	SW7196	14	0	14	OK @30 days	OK @7 days	OK @37 days
EF-B77-10.0	SW7196	12	1	13	OK @30 days	OK @7 days	OK @37 days
EF-B77-10.0	SW7196	14	0	14	OK @30 days	OK @7 days	OK @37 days
EF-B77-15.0	SW7196	12	1	13	OK @30 days	OK @7 days	OK @37 days
EF-B77-15.0	SW7196	14	0	14	OK @30 days	OK @7 days	OK @37 days
EF-B77-16.0	SW7196	12	1	13	OK @30 days	OK @7 days	OK @37 days
EF-B77-16.0	SW7196	14	0	14	OK @30 days	OK @7 days	OK @37 days
EF-B77-20.0	SW7196	12	1	13	OK @30 days	OK @7 days	OK @37 days
EF-B77-20.0	SW7196	14	0	14	OK @30 days	OK @7 days	OK @37 days
EF-B77-22.0	SW7196	12	1	13	OK @30 days	OK @7 days	OK @37 days
EF-B77-22.0	SW7196	14	0	14	OK @30 days	OK @7 days	OK @37 days
EF-B77-3.0	SW7196	12	1	13	OK @30 days	OK @7 days	OK @37 days
EF-B77-3.0	SW7196	14	0	14	OK @30 days	OK @7 days	OK @37 days
EF-B77-4.0	SW7196	12	1	13	OK @30 days	OK @7 days	OK @37 days
EF-B77-4.0	SW7196	14	0	14	OK @30 days	OK @7 days	OK @37 days
EF-B77-6.0	SW7196	12	1	13	OK @30 days	OK @7 days	OK @37 days
EF-B77-6.0	SW7196	14	0	14	OK @30 days	OK @7 days	OK @37 days

AECOM

SDG#: 460-29620
Batch 83480
 Cr+6 ICAL - 08/17/11
 Soils
 (p. 170 of data pkg)

x - concentration	y - response
0	0
50	0.046
100	0.087
500	0.404
750	0.613
1250	1.007

(p. 170 of data
pkg)

AECOM Calculated Intercept	-5.301	OK	Reported intercept	-5.301
AECOM Slope	1243	OK	Reported Slope	1243
AECOM Calculated r	1.000	OK	Reported r	1.000

EF-B77-10.0 (29620-10)

(p. 186 of data pkg)

Background reading 0.002
 Total absorbance 0.004
 Total absorbance - background 0.002
 Instrument Response (µg/L) -2.814
 Sample weight (g) 2.5
 Final Volume (mL) 100
 Percent solids 0.754
 Dilution Factor 1

AECOM Calculated Result (mg/Kg)	-0.15	OK sample ND	Reported Result (mg/Kg)	2.7
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LCS calculation

LCSS 460-83309/2-A pg. 186

LCS Soluble Instrument Response 0.515
 Instrument Concentration (ug/L) 635.000
 Sample weight 2.5
 Percent solids 1
 Dilution Factor 1

AECOM Calculated LCS Result (mg/Kg)	25.40	OK rounding	Reported Result (mg/Kg)	25.39
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%R = Found/True*100

True Value (mg/kg) 26.7

AECOM Calculated %R	95.1	OK rounding	Reported %R	95
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MS calculation

p. 186 EF-B77-10.0 (29620-10)

MS Insoluble Instrument Response 0.155
 Instrument Concentration (ug/L) 187.411
 Sample weight (g) 2.5
 Percent solids 0.754
 Dilution Factor 50

AECOM Calculated MS Result (mg/Kg)	497	OK rounding	Reported Result (mg/Kg)	496.7
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%R = Found/True*100

pg. 114 of data pkg

True Value (mg/kg) 938
 Native concentration (g) 0

%R	53	OK	Reported %R	53
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Percent Solids pg. 199 EF-B77-10.0 (29620-10)

Empty dish weight= 1.02
 Wet weight= 6.03
 Dry weight= 4.8

AECOM%solids =	75.4	OK	TestAmerica reported %solids=	75.4
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Reporting limit EF-B77-10.0 (29620-10) pg. 186 of data pkg

Low Standard 50
 Initial weight (g) 2.5
 Final volume (mL) 100
 Percent solids 0.75
 Dilution Factor 1.00

Reporting Limit	2.7	OK	Reported RL (mg/Kg)=	2.7
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Sample Calculations:

EF-B74-2.5 (29620-1) pg. 186 of data pkg

Background reading 0.004
 Total absorbance 0.104
 Total absorbance - background 0.1
 Instrument Response (µg/L) 119.029
 Sample weight (g) 2.51
 Final Volume (mL) 100
 Percent solids 0.834
 Dilution Factor 1

AECOM Calculated Result (mg/Kg)	5.69	OK rounding	Reported Result (mg/Kg)	5.70
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EF-B74-6.0 (29620-2) pg. 186 of data pkg

Background reading 0.001
 Total absorbance 0.019
 Total absorbance - background 0.018
 Instrument Response (µg/L) 17.078
 Sample weight (g) 2.5
 Final Volume (mL) 100
 Percent solids 0.912
 Dilution Factor 1

AECOM Calculated Result (mg/Kg)	0.75	OK	Reported Result (mg/Kg)	0.75
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EF-B74-11.0 (29620-3) pg. 186 of data pkg

Background reading 0.004
 Total absorbance 0.018
 Total absorbance - background 0.014
 Instrument Response (µg/L) 12.105
 Sample weight (g) 2.52
 Final Volume (mL) 100
 Percent solids 0.848
 Dilution Factor 1

AECOM Calculated Result (mg/Kg)	0.6	OK sample ND	Reported Result (mg/Kg)	2.3
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EF-B74-16.5 (29620-4)**pg. 186 of data pkg**

Background reading	0.001
Total absorbance	0.005
Total absorbance - background	0.004
Instrument Response (µg/L)	-0.328
Sample weight (g)	2.51
Final Volume (mL)	100
Percent solids	0.841
Dilution Factor	1

AECOM Calculated Result (mg/Kg)	0.0	OK sample ND	Reported Result (mg/Kg)	2.4
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EF-B74-22.5 (29620-5)**pg. 186 of data pkg**

Background reading	0
Total absorbance	0
Total absorbance - background	0
Instrument Response (µg/L)	-5.301
Sample weight (g)	2.56
Final Volume (mL)	100
Percent solids	0.834
Dilution Factor	1

AECOM Calculated Result (mg/Kg)	-0.2	OK sample ND	Reported Result (mg/Kg)	2.3
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EF-B73-2.5 (29620-6)**pg. 186 of data pkg**

Background reading	0.004
Total absorbance	0.01
Total absorbance - background	0.006
Instrument Response (µg/L)	2.159
Sample weight (g)	2.49
Final Volume (mL)	100
Percent solids	0.813
Dilution Factor	1

AECOM Calculated Result (mg/Kg)	0.1	OK sample ND	Reported Result (mg/Kg)	2.5
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EF-B77-3.0 (29620-7)**pg. 186 of data pkg**

Background reading	0
Total absorbance	0.003
Total absorbance - background	0.003
Instrument Response (µg/L)	-1.571
Sample weight (g)	2.49
Final Volume (mL)	100
Percent solids	0.944
Dilution Factor	1

AECOM Calculated Result (mg/Kg)	-0.1	OK sample ND	Reported Result (mg/Kg)	2.1
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EF-B77-4.0 (29620-8)**pg. 186 of data pkg**

Background reading	0.005
Total absorbance	0.003
Total absorbance - background	-0.002
Instrument Response (µg/L)	-7.788
Sample weight (g)	2.49
Final Volume (mL)	100
Percent solids	0.863
Dilution Factor	1

AECOM Calculated Result (mg/Kg)	-0.4	OK sample ND	Reported Result (mg/Kg)	2.3
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EF-B77-6.0 (29620-9)**pg. 186 of data pkg**

AECOM

Background reading	0.001			
Total absorbance	0.005			
Total absorbance - background	0.004			
Instrument Response (µg/L)	-0.328			
Sample weight (g)	2.53			
Final Volume (mL)	100			
Percent solids	0.653			
Dilution Factor	1			
AECOM Calculated Result (mg/Kg)	-0.02	OK sample ND	Reported Result (mg/Kg)	3.0

EF-B77-15.0 (29620-11) pg. 186 of data pkg

Background reading	0.009			
Total absorbance	0.013			
Total absorbance - background	0.004			
Instrument Response (µg/L)	-0.328			
Sample weight (g)	2.51			
Final Volume (mL)	100			
Percent solids	0.701			
Dilution Factor	1			
AECOM Calculated Result (mg/Kg)	-0.02	OK sample ND	Reported Result (mg/Kg)	2.8

EF-B77-22.0 (29620-12) pg. 186 of data pkg

Background reading	0			
Total absorbance	0.004			
Total absorbance - background	0.004			
Instrument Response (µg/L)	-0.328			
Sample weight (g)	2.51			
Final Volume (mL)	100			
Percent solids	0.815			
Dilution Factor	1			
AECOM Calculated Result (mg/Kg)	-0.02	OK sample ND	Reported Result (mg/Kg)	2.4

EF-B77-20.0 (29620-13) pg. 186 of data pkg

Background reading	0.254			
Total absorbance	0.211			
Total absorbance - background	-0.043			
Instrument Response (µg/L)	-58.763			
Sample weight (g)	2.5			
Final Volume (mL)	100			
Percent solids	0.319			
Dilution Factor	1			
AECOM Calculated Result (mg/Kg)	-7.4	Estimated; % solids < 50%	Reported Result (mg/Kg)	6.3

EF-B76-2.0 (29620-14) pg. 186 of data pkg

Background reading	0			
Total absorbance	0.004			
Total absorbance - background	0.004			
Instrument Response (µg/L)	-0.328			
Sample weight (g)	2.48			
Final Volume (mL)	100			
Percent solids	0.9			
Dilution Factor	1			
AECOM Calculated Result (mg/Kg)	0.0	OK sample ND	Reported Result (mg/Kg)	2.2

EF-B77-16.0 (29620-16) pg. 186 of data pkg

AECOM

Background reading	0.266
Total absorbance	0.241
Total absorbance - background	-0.025
Instrument Response (µg/L)	-36.384
Sample weight (g)	2.53
Final Volume (mL)	100
Percent solids	0.353
Dilution Factor	1

AECOM Calculated Result (mg/Kg)	-4.1	Esitimated; % solids < 50 %	Reported Result (mg/Kg)	5.6
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Data Validation Report

Project	PPG – EF	Page	1
Laboratory	Test America, NJ		
Laboratory Job No.:	460-29712		
Analysis/Method:	Hexavalent Chromium SW846 3060A/7196A (including pH and Eh)		
Validation Level:	Full		
Site Location/Address:	Garfield Avenue Soil RI, Site 114, Jersey City, NJ		
AECOM Project Number:	60154801-0007		
Prepared by: Justin Webster/AECOM	Completed on: August 25, 2011		
Reviewed by: Lisa Krowitz/AECOM	File Name: 2011-08-25 Hex Cr DV Report EF 460-29712-F.docx		

Introduction

The results of quality control data analyzed with site samples were used to assess the overall reliability of the data. The following qualifiers were used to identify data quality issues:

- U: Indicates the analyte was not detected in the sample above the sample reporting limit.
- J: Indicates the result was an estimated value; the associated numerical value was an approximate concentration of the analyte in the sample.
- UJ: Indicates the analyte was not detected above the reporting limit and the reporting limit was approximate.
- R: The sample result was rejected due to serious deficiencies; the presence or absence of the analyte could not be confirmed.

Sample Information

The samples listed below were collected by AECOM on August 8, 2011 as part of the Garfield Avenue Soil RI sampling task at PPG Site 114, Jersey City, New Jersey.

Field ID	Laboratory ID	Matrix	Fraction
EB080911 (field blank)	460-29712-8	Aqueous	Hexavalent Chromium
EF-B75-7.5	460-29712-1	Soil	Hexavalent Chromium
EF-B75-10.0	460-29712-2	Soil	Hexavalent Chromium
EF-B73-7.5	460-29712-3	Soil	Hexavalent Chromium
EF-B73-7.5x (field duplicate)	460-29712-4	Soil	Hexavalent Chromium
EF-B73-12.5	460-29712-5	Soil	Hexavalent Chromium
EF-B73-17.5	460-29712-6	Soil	Hexavalent Chromium
EF-B73-22.5	460-29712-7	Soil	Hexavalent Chromium

The samples were collected following the procedures detailed in the NJDEP - Approved Remedial Investigation Work Plan – Soil Non-Residential Chromate Chemical Production Waste Sites 114, 132, 133, 135, 137, 143, and 186 (March 2011).

General Comments

The data package was complete. Quality control (QC) issues identified during validation are discussed below. Refer to the Soil Target Analyte Summary Hit List for a listing of all detected results, qualified results, and associated qualifications, where applicable.

Matrix Spike Results

Soil sample EF-B75-10.0 (460-29712-2) was selected for soluble and insoluble matrix spike analysis. The initial analysis (batch 83772) soluble and insoluble matrix spike recoveries were 75% and 83%, respectively, which met quality control criteria of 75-125%R. The post spike result for the initial analysis (83772) was recovered at 96%, which also met the criteria of 85-115%R; therefore, no data qualifications were required.

Laboratory Duplicate Results

Sample EF-B75-10.0 (460-29712-2) was the laboratory duplicate sample associated with the samples in this data set. The relative percent differences (RPD) result was not calculated since the original and duplicate sample results were reported as nondetect; therefore, no data qualifications were required on this basis.

Field Duplicate Results

Sample EF-B73-7.5x was submitted as the field duplicate for sample EF-B75-7.5. The relative percent difference (RPD) was not calculated because the result for the original sample was reported as nondetect and field duplicate sample was reported as estimated above the method detection limit (MDL) but below the reporting limit (RL); therefore, field duplicate precision was deemed acceptable.

Sample Reporting Limits

Samples EF-B73-7.5x was qualified "J" as estimated by the laboratory. The reported result was less than the reporting limit (RL), but greater than or equal to the method detection limit (MDL) and; therefore, is an approximate value.

Data Quality and Recommendations

In general, these data appear to be valid as reported by the laboratory and may be used for decision making purposes. No data were rejected. Qualified results, if applicable, were discussed in Attachments A and B below.

Attachments

Attachment A Target Analyte Summary Hitlist(s)

Attachment B Data Validation Report Form

Attachment A

Target Analyte Summary Hitlist(s)

Soil Target Analyte Summary Hit List

Site Name PPG EF Site 114, Jersey City, NJ
Sampling Date August 8, 2011
Lab Name/ID Test America, Edison, NJ
SDG No 460-29712
Sample Matrix Soil
Trip Blank ID NA
Field Blank ID EB080811

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
EF-B73-12.5	460-29712-5	CHROMIUM (HEXAVALENT)	U	5.6	5.6	2.5		
EF-B73-17.5	460-29712-6	CHROMIUM (HEXAVALENT)	U	24.6	24.6	2.3		
EF-B73-22.5	460-29712-7	CHROMIUM (HEXAVALENT)	U	217	217	11.8		
EF-B73-7.5X	460-29712-4	CHROMIUM (HEXAVALENT)	U	0.95	0.95	2.7	Qualify	13

Note: The "U" under Method Blank column indicates a nondetect result.

The "U" under the Laboratory Sample Result and Validation Sample Result columns indicate a nondetect result at the RL.

NJDEP Validation Footnote

13. The reported analyte was qualified (J) because the sample result was greater than the MDL and less than the RL.

Attachment B

Data Validation Report Form

Client Name: PPG Industries	Project Number: 60154801-0007
Site Location: PPG-GA EF	Project Manager: Robert Cataldo
Laboratory: TestAmerica, New Jersey	Limited or <u>Full Validation</u> (circle one)
Laboratory Job No: 460-29712	Date Checked: 08/26/2011
Validator: Justin Webster	Peer: Lisa Krowitz

ITEM	YES	NO	N/A	COMMENTS
Sample results included?	x			15 Soils and 1 field blank
Reporting Limits met project requirements?	x			Soils - 2.2 mg/kg to 11.8 mg/kg
Field I.D. included?	x			
Laboratory I.D. included?	x			
Sample matrix included?	x			
Sample receipt temperature 2-6°C?	x			1.6°C ; no actions taken for cooler temperature less than 2°C
Signed COCs included?	x			
Date of sample collection included?	x			08/08/2011
Date of sample digestion included?	x			8/18/11
Holding time to digestion met criteria? Soils -30 days from collection to digestion.	x			See Below " Holding Times"
Date of analysis included?	x			Aqs 8/09/11 @ 0812. Soils 08/22/11
Holding time to analysis met criteria? Soils -168 hours from digestion to analysis. Aqueous – 24 hours from collection to analysis.	x			See Below "Holding Times"
Method reference included?	x			3060A/7196A
Laboratory Case Narrative included?	x			

Definitions: MDL – Method Detection Limit; %R – Percent Recovery; RL – Reporting Limit; RPD – Relative Percent Difference; RSD – Relative Standard Deviation ;Corr – Correlation Coefficient.

Comments

Field Duplicates:

EF-B73-7.5 (29712-3)	EF-B73-7.5x (29712-4)	% RPD
2.8 U nondetect result	0.95 J estimated > MDL < RL	The RPD was not calculated since the original result was nondetect.

Sample dilutions:

EF-B73-22.5(5x)

ITEM	YES	NO	N/A	COMMENTS
Initial Calibration Documentation Included in Lab Package?	x			Cal source (aqs WThcrIM2-00025) (soil WThcrIM 00027)
1. Blank plus 4 standards (7196A) or blank plus 3 standards (7199), 2. Correlation coefficient of ≥ 0.995 (7196A) or ≥ 0.999 (7199). 3. Calibrate daily or each time instrument is set up.	x			1. Each analysis 1 blank and 5 cal STDs 2. All analyses meet CC 3. Yes
Calibration Check Standard (CCS) for 7196A and Quality Control Sample (QCS) for 7199 Included in Lab Package?	x			Check source (aqs WThcrIM4-00025) (soils WThcrIM3 00012)
1. %R criteria met? (90 - 110%). 2. Correct frequency of once every 10 samples 3. CCS and QCS from independent source and at mid level of calibration curve.	x			1. All met %R 2. Analyzed every 10 samples 3. Yes
Calibration Blanks	x			Aqs – 460-82502/1 and Soils 460-83772/1
1. Analyzed prior to initial calibration standards and after each CCS/QCS? 2. Absolute value should not exceed MDL.	x			1. Yes 2. Yes
Method Blank and Field Blanks Included in Lab Package?	x			Field blank EB080811 was nondetect
1. Method blank analyzed with each preparation batch? 2. Absolute value should not exceed MDL.	x			1. Yes, aqs – 460-82502/9. Soils –460- 83450/1-A 2. Yes, all MBs and field blank were less than MDL.
Eh and pH data.	x			
Eh and pH data was included and plotted for all samples?	x			
Soluble Matrix Spike Data Included in Lab Package?	x			460-29712-2 (EF-B75-10.0)
1. %R criteria met? (75-125%R). 2. Was the spike concentration 40 mg/Kg? 3. Was a sample spiked at the frequency of 1/batch or 20 samples?	x			1. Yes, initial batch 83772 = 75% 2. Yes, batches 83772 = 50 mg/kg 3. Yes for all batches.
Insoluble Matrix Spike Data Included in Lab Package?	x			460-29712-2 (EF-B75-10.0)
1. %R criteria met? (75-125%R). 2. Was the spike concentration 400 to 800 mg/Kg? 3. Was a sample spiked at the frequency of 1/batch or 20 samples?	x			1. Yes, batch 83772 = 83% 2. Yes, batch 83772 = 885 mg/kg 3. Yes for all batches.
Post Digestion Spike	x			460-29712-2 (EF-B75-10.0)
1. %R criteria met? (85-115%R). 2. Was the spike concentration 40 mg/Kg or twice the sample concentration? 3. Was a sample spiked at the frequency of 1/batch or 20 samples?	x			1. No, batch 83772 = 96% 2. Yes, batch 83772 = 50 mg/kg. 3. Yes for all batches
Sample Duplicate Data Included in Lab Package?	x			460-29712-2 (EF-B75-10.0)
1. RPD criteria met? (RPD < 20%) of both results are $\geq 4x$ RL or control limit of $\pm RL$ if both results are $< 4x$ RL. 2. Was a sample spiked at the frequency of 1/batch or 20 samples?	x			1. The RPD for batch 83277 was not calculated due to nondetect results for both the original and duplicate analysis.
Was a Laboratory Control Sample (LCS) Included in Lab Package?	x			
1. %R criteria met? (80-120%R). 2. Was an LCS analyzed at the frequency of 1/batch or 20 samples?	x			1. Yes 2. Yes
Miscellaneous Items.				
1. For soils by 7196A, was the pH within a range of 7.0-8.0? 2. For soils by 7199, was the pH within a range of 9.0-9.5? 3. For aqueous by 7196A, was the pH with a range of 1.5-2.5? 4. For soils (3060A), was the digestion temperature 90-95°C for at least 60 minutes? 5. For 7199, was each sample injected twice and was the RPD ≤ 20 ?	x			1. Yes 2. NA 3. Yes 4. Yes 5. NA

Holding Times

Sample ID	Method	Days from Sampling to Prep	Days from Prep to Analysis	Days from Sampling to Analysis	Sampling to Prep Status	Prep to Analysis Status	Sampling to Analysis Status
EB080811	SW7196			1			OK @1 days
EF-B73-12.5	SW7196	10	4	14	OK @30 days	OK @7 days	OK @37 days
EF-B73-17.5	SW7196	10	4	14	OK @30 days	OK @7 days	OK @37 days
EF-B73-22.5	SW7196	10	4	14	OK @30 days	OK @7 days	OK @37 days
EF-B73-7.5	SW7196	10	4	14	OK @30 days	OK @7 days	OK @37 days
EF-B73-7.5X	SW7196	10	4	14	OK @30 days	OK @7 days	OK @37 days
EF-B75-10.0	SW7196	10	4	14	OK @30 days	OK @7 days	OK @37 days
EF-B75-7.5	SW7196	10	4	14	OK @30 days	OK @7 days	OK @37 days

SDG#: 460-29712
Batch 83772
 Cr+6 ICAL - 08/22/11
 Soils
 (p. 162 of data pkg)

x - concentration	y - response
0	0
50	0.044
100	0.089
500	0.412
750	0.616
1250	1.022

(p. 162 of data pkg)

AECOM Calculated Intercept	-4.505	OK	Reported intercept	-4.505
AECOM Slope	1226	OK	Reported Slope	1226
AECOM Calculated r	1.000	OK	Reported r	1.000

EF-B75-10.0 (29712-2) source QC sample (p. 173 of data pkg)

Background reading	0
Total absorbance	0.002
Total absorbance - background	0.002
Instrument Response (µg/L)	-2.052
Sample weight (g)	2.5
Final Volume (mL)	100
Percent solids	0.8
Dilution Factor	1

AECOM Calculated Result (mg/Kg)	-0.10	OK sample ND	Reported Result (mg/Kg)	2.5
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LCS calculation LCSS 460-83450/2-A pg. 173

LCS Soluble Instrument Response	0.519
Instrument Concentration (ug/L)	631.949
Sample weight	2.5
Percent solids	1
Dilution Factor	1

AECOM Calculated LCS Result (mg/Kg)	25.28	OK rounding	Reported Result (mg/Kg)	25.27
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%R = Found/True*100

True Value (mg/kg)	26.7
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AECOM Calculated %R	94.7	OK rounding	Reported %R	95
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MS calculation p. 173 EF-B75-10.0 (29712-2)

MS Insoluble Instrument Response	0.243
Instrument Concentration (ug/L)	293.488
Sample weight (g)	2.5
Percent solids	0.8
Dilution Factor	50

AECOM Calculated MS Result (mg/Kg)	734	OK rounding	Reported Result (mg/Kg)	733.2
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%R = Found/True*100

pg. 109 of data pkg

True Value (mg/kg)	885
Native concentration (g)	0

%R	83	OK	Reported %R	83
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AECOM

Percent Solids

pg. 180 EF-B75-10.0 (29712-2)

Empty dish weight= 1.01
Wet weight= 5.97
Dry weight= 4.98

AECOM%solids =	80.0	OK	TestAmerica reported %solids=	80.0
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Reporting limit EF-B75-10.0 (29712-2)

pg. 173 of data pkg

Low Standard 50
Initial weight (g) 2.5
Final volume (mL) 100
Percent solids 0.80
Dilution Factor 1.00

Reporting Limit	2.5	OK	Reported RL (mg/Kg)=	2.5
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Sample Calculations:

EF-B75-7.5 (29712-1)

pg. 173 of data pkg

Background reading 0.006
Total absorbance 0.014
Total absorbance - background 0.008
Instrument Response (µg/L) 5.306
Sample weight (g) 2.46
Final Volume (mL) 100
Percent solids 0.762
Dilution Factor 1

AECOM Calculated Result (mg/Kg)	0.28	OK sample ND	Reported Result (mg/Kg)	2.70
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EF-B73-7.5 (29712-3)

pg. 173 of data pkg

Background reading 0.002
Total absorbance 0.007
Total absorbance - background 0.005
Instrument Response (µg/L) 1.627
Sample weight (g) 2.49
Final Volume (mL) 100
Percent solids 0.721
Dilution Factor 1

AECOM Calculated Result (mg/Kg)	0.09	OK sample ND	Reported Result (mg/Kg)	2.80
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EF-B73-7.5x (29712-4)

pg. 173 of data pkg

Background reading 0
Total absorbance 0.018
Total absorbance - background 0.018
Instrument Response (µg/L) 17.569
Sample weight (g) 2.51
Final Volume (mL) 100
Percent solids 0.736
Dilution Factor 1

AECOM Calculated Result (mg/Kg)	0.95	OK	Reported Result (mg/Kg)	0.95
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EF-B73-12.5 (29712-5)

pg. 173 of data pkg

AECOM

Background reading	0		
Total absorbance	0.096		
Total absorbance - background	0.096		
Instrument Response (µg/L)	113.221		
Sample weight (g)	2.5		
Final Volume (mL)	100		
Percent solids	0.812		
Dilution Factor	1		
AECOM Calculated Result (mg/Kg)	5.6	OK	Reported Result (mg/Kg) 5.6

EF-B73-17.5 (29712-6) pg. 173 of data pkg

Background reading	0.001		
Total absorbance	0.438		
Total absorbance - background	0.437		
Instrument Response (µg/L)	531.391		
Sample weight (g)	2.47		
Final Volume (mL)	100		
Percent solids	0.873		
Dilution Factor	1		
AECOM Calculated Result (mg/Kg)	24.6	OK	Reported Result (mg/Kg) 24.6

EF-B73-22.5 (29712-7) pg. 174 of data pkg

Background reading	0.001		
Total absorbance	0.752		
Total absorbance - background	0.751		
Instrument Response (µg/L)	916.452		
Sample weight (g)	2.52		
Final Volume (mL)	100		
Percent solids	0.839		
Dilution Factor	5		
AECOM Calculated Result (mg/Kg)	217	OK	Reported Result (mg/Kg) 217.0

Data Validation Report

Project:	PPG Forrest St
Laboratory:	TestAmerica, Edison, NJ
Laboratory Job No.:	460-34285
Analysis/Method:	Hexavalent Chromium SW846 3060A/7196A Total Chromium SW846 3010A/3050B/6020
Validation Level:	Full (Hexavalent Chromium) Limited (Total Chromium)
Site Location/Address:	78 & 90 Forrest St, Jersey City, NJ
AECOM Project Number:	60154801-6001A
Prepared by: Justin Webster/AECOM	Completed on: March 14, 2012
Reviewed by: Lisa Krowitz/AECOM	File Name: 2012-03-14 HxCr_Cr DV Report 460-34285-F.docx

Introduction

The data were reviewed in accordance with the FSP-QAPP and the following NJDEP validation Standard Operating Procedures (SOP):

- NJDEP Office of Data Quality SOP 5.A.10, Rev 3 (September 2009), SOP for Analytical Data Validation of Hexavalent Chromium – for USEPA SW-846 Method 3060A, USEPA SW-846 Method 7196A and USEPA SW-846 Method 7199
- NJDEP Office of Data Quality SOP 5.A.16, Rev 1 (May 2002), Quality Assurance Data Validation of Analytical Deliverables for Inorganics (based on USEPA SW-846 Methods).

The results of quality control data analyzed with site samples were used to assess the overall reliability of the data. The following qualifiers were used to identify data quality issues:

- U: Indicates the analyte was not detected in the sample above the sample reporting limit.
- J: Indicates the result was an estimated value; the associated numerical value was an approximate concentration of the analyte in the sample.
- UJ: Indicates the analyte was not detected above the reporting limit and the reporting limit was approximate.
- R: The sample result was rejected due to serious deficiencies; the presence or absence of the analyte could not be confirmed.

Sample Information

The samples listed below were collected by AECOM on December 2, 2011 as part of the Forrest Street task at 78 & 90 Forrest St, Jersey City, New Jersey.

Field ID	Laboratory ID	Matrix	Fraction
MW25A-6.0	460-34285-1	Soil	Hexavalent Chromium, Total Chromium
MW25A-8.0	460-34285-2	Soil	Hexavalent Chromium, Total Chromium,
MW25A-8.0X (Field duplicate for sample MW25A-8.0)	460-34285-3	Soil	Hexavalent Chromium, Total Chromium
MW25-10.0	460-34285-4	Soil	Hexavalent Chromium, Total Chromium
MW25A-12.0	460-34285-5	Soil	Hexavalent Chromium, Total Chromium.
MW25A-14.0	460-34285-6	Soil	Hexavalent Chromium, Total Chromium
EB-120211 (Equipment blank)	460-34285-7	Aqueous	Hexavalent Chromium, Total Chromium

The sample was collected following the procedures detailed in the Draft Work Scope and Budget Estimate for Site Inspection and Investigation Activities for 78 & 90 Forrest Street, Jersey City, New Jersey and the Field Sampling Plan/Quality Assurance Project Plan for Non-Residential and Residential Chromium Sites Hudson County, New Jersey (June 2010).

General Comments

The data package was complete. Quality control (QC) issues identified during validation are discussed below. Refer to the Soil Target Analyte Summary Hit List for a listing of all detected results, qualified results, and associated qualifications, where applicable.

Hexavalent Chromium

All QC requirements were met; therefore no data qualifications were required.

Total Chromium

All QC requirements were met; therefore no data qualifications were required.

Data Quality and Usability

In general, these data appear to be valid and may be used for decision-making purposes. No data were rejected or qualified.

Attachments

Attachment A Target Analyte Summary Hitlist(s)

Attachment B Data Validation Report Form

Attachment A

Target Analyte Summary Hitlist(s)

Soil Target Analyte Summary Hit List (Hexavalent Chromium)

Site Name Forrest Street Jersey City, NJ
Sampling Date December 2, 2011
Lab Name/ID TestAmerica, Edison, NJ
SDG No 460-34285
Sample Matrix Soil
Trip Blank ID NA
Field Blank ID EB120211

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/Kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
MW25A-10.0	460-34285-4	CHROMIUM (HEXAVALENT)	U	14.1	14.1	2.6		
MW25A-12.0	460-34285-5	CHROMIUM (HEXAVALENT)	U	93.6	93.6	13.6		
MW25A-14.0	460-34285-6	CHROMIUM (HEXAVALENT)	U	78.6	78.6	11.3		
MW25A-6.0	460-34285-1	CHROMIUM (HEXAVALENT)	U	33.7	33.7	2.5		
MW25A-8.0	460-34285-2	CHROMIUM (HEXAVALENT)	U	94.2	94.2	11.8		
MW25A-8.0X	460-34285-3	CHROMIUM (HEXAVALENT)	U	109	109	12.0		

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicate a nondetect result at the RL.

Soil Target Analyte Summary Hit List (Total Chromium)

Site Name Forrest Street, Jersey City, NJ
Sampling Date December 2, 2011
Lab Name/ID TestAmerica, Edison, NJ
SDG No 460-34285
Sample Matrix Soil
Trip Blank ID NA
Field Blank ID EB120211

Field Sample ID	Lab Sample ID	Analyte	Method Blank	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
MW25A-10.0	460-34285-4	CHROMIUM	U	300	300	1.2		
MW25A-12.0	460-34285-5	CHROMIUM	U	326	326	1.3		
MW25A-14.0	460-34285-6	CHROMIUM	U	264	264	1.1		
MW25A-6.0	460-34285-1	CHROMIUM	U	852	852	1.2		
MW25A-8.0	460-34285-2	CHROMIUM	U	231	231	1.1		
MW25A-8.0X	460-34285-3	CHROMIUM	U	239	239	1.1		

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicate a nondetect result at the RL.

Attachment B

Data Validation Report Form

Client Name: PPG Industries	Project Number: 60154801-6001A
Site Location: PPG- Forrest St	Project Manager: Robert Cataldo
Laboratory: TestAmerica, Edison, New Jersey	Limited or <u>Full Validation</u> (circle one)
Laboratory Job No: 460-34285	Date Checked: 03/14/12
Validator: Justin Webster	Peer: Lisa Krowitz

ITEM	YES	NO	N/A	COMMENTS
Sample results included?	x			6 Soils and 1 equipment blank
Reporting Limits met project requirements?	x			Soils - 2.2 mg/kg to 13.6 mg/kg due to dilutions
Field I.D. included?	x			
Laboratory I.D. included?	x			
Sample matrix included?	x			
Sample receipt temperature 2-6°C?	x			2.9°C
Signed COCs included?	x			
Date of sample collection included?	x			12/2/2011
Date of sample digestion included?	x			Soil: HxCr prepped on 12/8/11. ORP was leached and analyzed on 12/21/11, ferrous iron was leached on 12/19/11, sulfide was leached and analyzed on 12/07/11, TOC was analyzed on 12/18/11.
Holding time to digestion met criteria? Soils -30 days from collection to digestion.	x			See below " Holding Times"
Date of analysis included?	x			Soil : HxCr analyzed on 12/8/11, ORP was analyzed on 12/21/11, ferrous iron on 01/04/12, sulfide on 12/7/11, TOC on 12/6/11, and pH on 12/21/11 Ags: HxCr analyzed on 12/3/11 @ 0953, pH on 12/30/11, ORP 12/7/11
Holding time to analysis met criteria? Soils -168 hours from digestion to analysis. Aqueous – 24 hours from collection to analysis.	x			
Method reference included?	x			3060A/7196A/2580B/3500_FE/9030B/9040B
Laboratory Case Narrative included?	x			

Definitions: MDL – Method Detection Limit; %R – Percent Recovery; RL – Reporting Limit; RPD – Relative Percent Difference; RSD – Relative Standard Deviation ;Corr – Correlation Coefficient.

Comments

Field Duplicates:

MW25A-8.0	MS25A-8.0X	%RPD
94.2 (mg/Kg)	109 (mg/Kg)	14.6 %

Sample dilutions: Samples MW25A-12.0, MW25A-14.0, MW25A-8.0, and MW25A-8.0X were analyzed at a 5x dilution. All other samples were analyzed undiluted.

ITEM	YES	NO	N/A	COMMENTS
Initial Calibration Documentation Included in Lab Package?	x			Cal source (aqc WThcrIM2-00028) (soil WThcrIM-00030)
1. Blank plus 4 standards (7196A) or blank plus 3 standards (7199), 2. Correlation coefficient of ≥ 0.995 (7196A) or ≥ 0.999 (7199). 3. Calibrate daily or each time instrument is set up.	x x x			1. Each analysis 1 blank and 5 cal STDs 2. All analyses meet CC 3. Yes
Calibration Check Standard (CCS) for 7196A and Quality Control Sample (QCS) for 7199 Included in Lab Package?	x			Check source (aqc WThcrIM4-00027) (soils WThcrIM3-00014)
1. %R criteria met? (90 - 110%). 2. Correct frequency of once every 10 samples 3. CCS and QCS from independent source and at mid level of calibration curve.	x x x			1. All met %R 2. Analyzed every 10 samples 3. Yes
Calibration Blanks	x			Aqs: 460-95020/1. Soils 460-95326/1
1. Analyzed prior to initial calibration standards and after each CCS/QCS? 2. Absolute value should not exceed MDL.	x x			1. Yes 2. Yes
Method Blank and Field Blanks Included in Lab Package?	x			Equipment Blank EB120211 was ND.
1. Method blank analyzed with each preparation batch? 2. Absolute value should not exceed MDL.	x x			1. Yes, aqs – 460-95020/9 (10.0 µg/L). Soils –460- 95301/1-A (2.0 mg/Kg) 2. Yes, all blanks were less than MDL.
Eh and pH data .	x			
Eh and pH data was included and plotted for all samples?	x			All soil samples indicated oxidizing conditions.
Soluble Matrix Spike Data Included in Lab Package?	x			460-34285-6 [MW25A-14.0]
1. %R criteria met? (75-125%R). 2. Was the spike concentration 40 mg/Kg? 3. Was a sample spiked at the frequency of 1/batch or 20 samples?	x x x			1. Yes, batch 95326 = 81 % 2. Yes, 45.3 mg/kg was used. 3. Yes for all batches.
Insoluble Matrix Spike Data Included in Lab Package?	x			460-34285-6 [MW25A-14.0]
1. %R criteria met? (75-125%R). 2. Was the spike concentration 400 to 800 mg/Kg? 3. Was a sample spiked at the frequency of 1/batch or 20 samples?	x x x			1. Yes, batch 95326 = 102% 2. Yes, 801 mg/kg was used. 3. Yes for all batches.
Post Digestion Spike	x			460-34285-6 [MW25A-14.0]
1. %R criteria met? (85-115%R). 2. Was the spike concentration 40 mg/Kg or twice the sample concentration? 3. Was a sample spiked at the frequency of 1/batch or 20 samples?	x x x			1. Yes, batch 95326 = 104% 2. Yes, 158 mg/kg was used. 3. Yes for all batches.
Sample Duplicate Data Included in Lab Package?	x			460-34285-6 [MW25A-14.0]
1. RPD criteria met? (RPD < 20%) of both results are $\geq 4x$ RL or control limit of $\pm RL$ if both results are $< 4x$ RL. 2. Was a sample spiked at the frequency of 1/batch or 20 samples?	x x			1. The laboratory duplicate RPD analysis for batch 95326 was reported at 7% and within the RPD criteria for sample results $> 4x$ the RL. 2. Yes
Was a Laboratory Control Sample (LCS) Included in Lab Package?	x			
1. %R criteria met? (80-120%R). 2. Was an LCS analyzed at the frequency of 1/batch or 20 samples?	x x			1. Yes, batch 95326 soluble = 100% and insoluble = 95%. 2. Yes
Miscellaneous Items.				
1. For soils by 7196A, was the initial pH within a range of 7.0-8.0? 2. For soils by 7199, was the pH within a range of 9.0-9.5? 3. For aqueous by 7196A, was the pH with a range of 1.5-2.5? 4. For soils (3060A), was the digestion temperature 90-95°C for at least 60 minutes? 5. For 7199, was each sample injected twice and was the RPD ≤ 20 ?	x x x x x		x x	1. Yes 2. NA 3. Yes 4. Yes 5. NA

SDG#: 460-34285
Batch 95326
 Cr+6 ICAL -12/8/2011
 Soils
 (p. 455 of data pkg)

x - concentration	y - response
0	0
50	0.044
100	0.086
500	0.408
750	0.598
1250	1.002

(p. 455 of data pkg)

AECOM Calculated Intercept	-4.698	OK	Reported intercept	-4.698
AECOM Slope	1253	OK	Reported Slope	1235
AECOM Calculated r	1.000	OK	Reported r	1.000

LCS calculation **LCSS 460-95301/2-A pg. 411 and 730**

LCS Soluble Instrument Response	0.262			
Instrument Concentration (ug/L)	323.499			
Sample weight	2.5			
Percent solids	1			
Dilution Factor	1			
AECOM Calculated LCS Result (mg/Kg)	12.94	OK	Reported Result (mg/Kg)	12.94

%R = Found/True*100

True Value (mg/kg)	13			
AECOM Calculated %R	99.5	OK rounding	Reported %R	100

MS calculation **MSI [MW25A-14.0] pgs. 402 and 730**

Background reading	0			
MS Insoluble Instrument Response	0.32			
Total absorbance - background	0.32			
Instrument Concentration (ug/L)	396.153			
Sample weight (g)	2.5			
Final Volume (mL)	100			
Percent solids	0.883			
Dilution Factor	50			
AECOM Calculated MS Result (mg/Kg)	897.3	OK rounding	Reported Result (mg/Kg)	897.1

%R = Found/True*100 **pg. 402**

True Value (mg/kg)	801			
Native concentration (g)	78.6			
%R	102.2	OK rounding	Reported %R	102

Percent Solids for sample MW25A-14.0 **pg. 736**

Empty dish weight=	1.04			
Wet weight=	6.36			
Dry weight=	5.74			
AECOM%solids =	88.3	OK	TestAmerica reported %solids=	82.2

Reporting limit calculation MW25A-14.0 **pg. 24 and 730**

Low Standard	50			
Initial weight (g)	2.5			
Final volume (mL)	100			
Percent solids	0.88			
Dilution Factor	5.00			
Reporting Limit	11.3	OK	Reported RL (mg/Kg)=	11.3

Sample Calculations**MW25A-6.0****pg. 19 and 730**

Background reading	0
Total absorbance	0.534
Total absorbance - background	0.534
Instrument Response (mg/L)	664.222
Sample weight (g)	2.58
Final Volume (mL)	100
Percent solids	0.764
Dilution Factor	1

AECOM Calculated Result (mg/Kg)	33.7	OK	Reported Result (mg/Kg)	33.7
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MW25A-10.0**pg. 22 and 730**

Background reading	0
Total absorbance	0.222
Total absorbance - background	0.222
Instrument Response (mg/L)	273.393
Sample weight (g)	2.49
Final Volume (mL)	100
Percent solids	0.777
Dilution Factor	1

AECOM Calculated Result (mg/Kg)	14.1	OK	Reported Result (mg/Kg)	14.1
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MW25A-14.0**pg. 24 and 730**

Background reading	0
Total absorbance	0.281
Total absorbance - background	0.281
Instrument Response (mg/L)	347.300
Sample weight (g)	2.5
Final Volume (mL)	100
Percent solids	0.883
Dilution Factor	5

AECOM Calculated Result (mg/Kg)	78.7	OK	Reported Result (mg/Kg)	78.7
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MW25A-8.0**pg. 20 and 730**

Background reading	0
Total absorbance	0.322
Total absorbance - background	0.322
Instrument Response (mg/L)	398.659
Sample weight (g)	2.53
Final Volume (mL)	100
Percent solids	0.836
Dilution Factor	5

AECOM Calculated Result (mg/Kg)	94.2	OK	Reported Result (mg/Kg)	94.2
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MW25A-8.0X**pg. 21 and 730**

Background reading	0
Total absorbance	0.366
Total absorbance - background	0.366
Instrument Response (mg/L)	453.776
Sample weight (g)	2.5
Final Volume (mL)	100
Percent solids	0.836
Dilution Factor	5

AECOM Calculated Result (mg/Kg)	108.6	OK rounding	Reported Result (mg/Kg)	109.0
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MW25A-12.0

pg. 23 and 731

Background reading	0		
Total absorbance	0.279		
Total absorbance - background	0.279		
Instrument Response (mg/L)	344.794		
Sample weight (g)	2.53		
Final Volume (mL)	100		
Percent solids	0.728		
Dilution Factor	5		
AECOM Calculated Result (mg/Kg)	93.6	OK	Reported Result (mg/Kg) 93.6

Client Name: PPG Industries	Project Number: 60154801-6001A
Site Location: PPG Forrest St	Project Manager: Robert Cataldo
Laboratory: Test America, Edison, New Jersey	Limited or Full Validation (circle one)
Laboratory Job No: 460-34285	Date Checked: 03/14/12
Validator: Justin Webster	Peer Review: Lisa Krowitz

ITEM	YES	NO	N/A	COMMENTS
Sample results included?	X			
Reporting Limits met project requirements?	X			
Field I.D. included?	X			
Laboratory I.D. included?	X			
Sample matrix included?	X			
Sample receipt temperature 2-6°C?	X			3.4°C
Signed COCs included?	X			
Date of sample collection included?	X			12/1/11
Date of sample digestion included?	X			Soil: Samples were prepared on 12/7/11 and 12/9/11 Aqs: EB sample was prepped on 12/6/11
Date of analysis included?	X			Soil: Samples were analyzed on 12/7/11 and 12/10/11. Aqs: EB sample was analyzed on 12/7/11.
Holding time met QC criteria? Metals -180 days from sample collection Mercury – 28 days from sample collection If HT exceeded by - ≤ 10 days, J/UJ all results - > 10 days, R all results	X			All holding times were met.
Method reference included?	X			SW846 3010A/3050B/6020
Laboratory Case Narrative included?	X			
Sample Dilutions	X			All soil samples from this SDG were analyzed at a 20x dilution. The aqs EB sample was analyzed at a 5x dilution.
Field Duplicates ("x" appended to sample ID) (RPD calculation on separate sheet)	x			Sample MW25A-8.0X was submitted as the field duplicate for sample MW27A-6.0. The RPD was 3% and within QC criteria.
Definitions: MDL – Method Detection Limit; %R – Percent Recovery; RL – Reporting Limit; RPD – Relative Percent Difference; RSD – Relative Standard Deviation :Corr – Correlation Coefficient.				
Comments				

ITEM	YES	NO	N/A	COMMENTS
Initial Calibration Documentation Included in Lab Package?			x	Not reviewed for limited validation
1. Calibrate daily or each time instrument is set up?. If no, reject (R) data. 2. ICP (6010) - Blank plus 1standard? If no, reject (R) data. 3. Hg (7470/7471) – Blank plus 5 standards? If no, reject (R) data.				
Initial Calibration Verification Standard (ICV) for ICP (6010) and Initial Calibration Check Standard (ICCS) for Hg (7470/7471) Included in Lab Package?			x	Not reviewed for limited validation
1. Analyzed immediately after initial calibration? If no, reject (R) data. 2. %R criteria met? (90 - 110%). If no, J positive results for affected analyte(s) if %R between 80-89% and 111-120% and indicate bias UJ non-detect results for affected analyte(s) if R% between 80-89% R all data for affected analyte(s) if <80% or >120% 3. Spot check ICV/ICCS results for several analytes				
Continuing Calibration Verification Standard (CCV) for ICP (6010) and Calibration Check Standard (CCS) for Hg (7470/7471) included in Lab Package?			x	Not reviewed for limited validation
1. Analyzed immediately after each ICV/ICC/CB and after every 10 samples? If no, reject (R) data. 2. CCS and CCV from independent source and at mid level of calibration curve. If no, reject (R) data. 3. %R criteria met? (90 - 110%) If no, J positive results for affected analyte(s) if %R between 80-89% and 111-120% and indicate bias UJ non-detect results for affected analyte(s) if %R between 80-89% R all data for affected analyte(s) if %R <80% or >120% 4. Spot check CCV/CCS results for several analytes				
Low Calibration Standard (CRI) included in Lab Package?			x	Not reviewed for limited validation
1. %R criteria met? - 50 - 150% for Co, Mn, Zn by ICP-MS, PB, TI by 6010) - 70-130% all others If no, refer to ILM05.4 NJ SOP 5.A.2 for actions.				
Calibration Blanks			x	Not reviewed for limited validation
1. Analyzed immediately after daily calibration and after each ICV/ICC/CCV/CCS, and after every 10 samples? If no, reject (R) data. 2. Absolute value $\leq 3xIDL$? If no, - if sample result $\leq 10xCB$ result, qualify affected analyte(s) in associated samples with CB - if sample result $> 10xCB$ result, no qualification				
Method Blank included in Lab Package?	x			
1. Method blank analyzed with each preparation batch or every SDG, or 1/20 samples? If no, reject (R) data, except no aqueous MB required for FB/EB if only soil samples were analyzed. 2. Method blank analyzed 1/20 samples? If - MB 1/25, J sample results from 21-25 - MB > 1/25, R sample results after 25 th sample 3. MB result nondetect? If no, - Sample result $\leq 3xMB$, negate UB - Sample result $<3xMB$, but $\leq 10xMB$, JB - Sample result $> 10xMB$, no qualification 4. Negative MB result reported? If yes, -Positive sample result $\leq 10xMB$, qualify estimated, biased low (J) -Non-detect sample result, qualify UJ, may be false non-detect	x			1. Yes, all frequency criteria were met. 2. Yes 3. Yes 4. No
Field Blanks/Equipment Blanks included in Lab Package?	x			Blanks apply to samples collected during same week as blank
1, FB/EB result nondetect? If no, - Sample result $\leq 3xFB/EB$, negate U - Sample result $<3xFB/EB$, but $\leq 10xFB/EB$, J - Sample result $> 10xFB/EB$, no qualification	x			Equipment Blank EB120211 was nondetect.

ITEM	YES	NO	N/A	COMMENTS
ICP Interference Check Sample (ICS) included in Lab Package?			x	Not reviewed for limited validation
1. Analyzed at beginning of analytical run? If no, reject (R) data. 2. %R criteria met? (80-120%) If no, %R > 120%, no qualification if sample result non-detect %R between 121-150%, J positive results, biased high %R between 50-79%, J/UJ results, biased low %R <50% or >150%, reject (R) result 3. Spot check accuracy of %Rs				
Matrix Spike/Matrix Spike Duplicate Data Included in Lab Package?	x			For Soil prep batch 95148, the source for the matrix spike was collected from a different site location. The source sample for prepbatch 95434 was collected with the samples collected in this SDG. Batch QC was used for the aqueous preparation batch.
1. MS/MSD %R (75-125%R) and RPD (\pm 20%) criteria met? - %R >125% J positive results for affected analyte(s) for all samples in the same batch/SDG, accept NDs. - %R <75% J/UJ for affected analyte(s) for all samples in the same batch/SDG - RPD outside \pm 20% J positive results for affected analyte(s) for all samples in the same batch/SDG, accept NDs. 2. Was a sample spiked at the frequency of 1/batch or 20 samples? 3. Was the MS performed on a site sample? 4. Was the MS performed on a FB/EB or TB? If yes, J all sample data.	x x	x		1. Yes, the MS result for sample MW25A-14.0 from batch 95434 was low -11%, however the native sample concentration was greater than 4 times the spike concentration. No data qualifications were required. 2. Yes, all frequency requirements were met. 3. Yes, MW25A-14.0. 4. No
Serial Dilution			x	Not reviewed for limited validation
1. %D (\leq 10%R) criteria met? - If analyte concentration > 25xIDL (7000) or > 10x IDL (6010) and %D > 10% J positive results for affected analyte(s) for all samples in the same batch/SDG, accept NDs. 2. Was the frequency 1/batch or 20 samples? 3. Was a site sample used? 4. Was a FB/EB or TB used? If yes, J all sample data. 5. Spot check accuracy of %Ds				
Post Digestion Spike			x	Not reviewed for limited validation
1. %R criteria met? (75-125%R). - %R >125% J positive results for affected analyte(s) for all samples in the same batch/SDG, accept NDs. - %R <75% J/UJ affected analyte(s) for all samples in the same batch/SDG. 2. Was the spike performed on a FB/EB or TB? If yes, J all sample data? 3. Was a sample spiked at the frequency of 1/batch or 20 samples?				
Laboratory Control Sample Data Included in Lab Package?	x			
1. LCS %R (80-120%R) criteria met? If no, J/UJ all affected analyte(s) for all samples in the same batch/SDG. data. 2. Was a sample spiked at the frequency of 1/batch or 20 samples? If no, J/UJ affected analyte(s) for all sample in the same batch/SDG.	x x			1. Yes, all LCS recoveries met applicable quality control criteria. 2. Yes
Laboratory Duplicate Data Included in Lab Package?	x			See comment above concerning the sources for the soil and aqueous preparation batches.
<u>Aqueous</u> If RPD is >20% but <100% and sample and field duplicate results are >5x the QL, estimate (J) results > the QL. If RPD is >100%, reject (R) results \geq the QL. If sample and/or duplicate is <5x the QL and absolute difference is > the QL, estimate (J) positive results <5x the QL and nondetects (UJ). If absolute difference is > 2x the QL, reject (R) non detects and positive results <5x the QL. <u>SOIL:</u> If RPD is >35% but <120% and sample and field duplicate results are >5x the QL, estimate (J) results > the QL. If RPD is > 120%, reject (R) results > the QL. If sample and/or duplicate is <5x the QL and absolute difference is >2x the QL, estimate (J) positive results <5x QL and nondetects (UJ). If absolute difference is >4x the QL, reject (R) non detects and positive results <5x QL.	x		x	<u>Aqs:</u> A non-site sample was used as the source for the QC analysis. Data qualifications are not applicable for non-site sample. <u>Soil:</u> Sample MW25A-14.0 RPD result was 8% and within QC criteria of < 35% for sample results > 5xRL. No data qualifications were required.

ITEM	YES	NO	N/A	COMMENTS
Field Duplicate Data Included in Lab Package?	x			Sample MW25A-8.0X was the field duplicate for sample MW25A-8.0.
<p><u>Aqueous</u></p> <p>If RPD is >20% but <100% and sample and field duplicate results are >5x the QL, estimate (J) results > the QL. If RPD is >100%, reject (R) results ≥ the QL. If sample and/or duplicate is <5x the QL and absolute difference is > the QL, estimate (J) positive results <5x the QL and nondetects (UJ). If absolute difference is > 2x the QL, reject (R) non detects and positive results <5x the QL.</p> <p><u>SOIL:</u></p> <p>If RPD is >35% but <120% and sample and field duplicate results are >5x the QL, estimate (J) results > the QL. If RPD is > 120%, reject (R) results > the QL. If sample and/or duplicate is <5x the QL and absolute difference is >2x the QL, estimate (J) positive results <5x QL and nondetects (UJ). - If absolute difference is >4x the QL, reject (R) non detects and positive results <5x QL.</p>	x		x	The RPD criteria was met with a result of 3% and within the QC criteria of < 35%.

Holding Time

Sample ID	Method	Days from Sampling to Prep	Days from Prep to Analysis	Days from Sampling to Analysis	Sampling to Prep Status	Prep to Analysis Status	Sampling to Analysis Status
EB-120211 Forrest	SW6020	4	1	5			OK @180 days
MW25A-10.0	SW6020	7	1	8			OK @180 days
MW25A-12.0	SW6020	7	1	8			OK @180 days
MW25A-14.0	SW6020	7	1	8			OK @180 days
MW25A-6.0	SW6020	5	0	5			OK @180 days
MW25A-8.0	SW6020	5	0	5			OK @180 days
MW25A-8.0X	SW6020	7	1	8			OK @180 days
EB-120211 Forrest	SW7196			1			OK @1 days
MW25A-10.0	SW7196	6	0	6	OK @30 days	OK @7 days	OK @37 days
MW25A-12.0	SW7196	6	0	6	OK @30 days	OK @7 days	OK @37 days
MW25A-14.0	SW7196	6	0	6	OK @30 days	OK @7 days	OK @37 days
MW25A-6.0	SW7196	6	0	6	OK @30 days	OK @7 days	OK @37 days
MW25A-8.0	SW7196	6	0	6	OK @30 days	OK @7 days	OK @37 days
MW25A-8.0X	SW7196	6	0	6	OK @30 days	OK @7 days	OK @37 days

Percent Solids

Sample ID	Percent Solids (%)	Status
MW25A-10.0	77.7	ok @30%
MW25A-12.0	72.8	ok @30%
MW25A-14.0	88.3	ok @30%
MW25A-6.0	76.4	ok @30%
MW25A-8.0	83.6	ok @30%
MW25A-8.0X	83.6	ok @30%

Field Duplicate

Sample ID	Duplicate ID	Compound	Sample Result	Duplicate Result	QL	Units	RPD	Action
MW25A-8.0	MW25A-8.0X	CHROMIUM	231	239	1.1	mg/kg	3.4	OK @35
MW25A-8.0	MW25A-8.0X	CHROMIUM (HEXAVALENT)	94.2	109	11.8	mg/kg	14.6	OK @35

Data Validation Report

Project:	PPG Forrest St
Laboratory:	TestAmerica, Edison, NJ
Laboratory Job No.:	460-34209
Analysis/Method:	Hexavalent Chromium SW846 3060A/7196A Total Chromium SW846 3010A/3050B/6020
Validation Level:	Full (Hexavalent Chromium) Limited (Total Chromium)
Site Location/Address:	78 & 90 Forrest St, Jersey City, NJ
AECOM Project Number:	60154801-6001A
Prepared by: Justin Webster/AECOM	Completed on: March 14, 2012
Reviewed by: Lisa Krowitz/AECOM	File Name: 2012-03-14 HxCr_Cr DV Report 460-34209-F.docx

Introduction

The data were reviewed in accordance with the FSP-QAPP and the following NJDEP validation Standard Operating Procedures (SOP):

- NJDEP Office of Data Quality SOP 5.A.10, Rev 3 (September 2009), SOP for Analytical Data Validation of Hexavalent Chromium – for USEPA SW-846 Method 3060A, USEPA SW-846 Method 7196A and USEPA SW-846 Method 7199
- NJDEP Office of Data Quality SOP 5.A.16, Rev 1 (May 2002), Quality Assurance Data Validation of Analytical Deliverables for Inorganics (based on USEPA SW-846 Methods).

The results of quality control data analyzed with site samples were used to assess the overall reliability of the data. The following qualifiers were used to identify data quality issues:

- U: Indicates the analyte was not detected in the sample above the sample reporting limit.
- J: Indicates the result was an estimated value; the associated numerical value was an approximate concentration of the analyte in the sample.
- UJ: Indicates the analyte was not detected above the reporting limit and the reporting limit was approximate.
- R: The sample result was rejected due to serious deficiencies; the presence or absence of the analyte could not be confirmed.

Sample Information

The samples listed below were collected by AECOM on December 1, 2011 as part of the Forrest Street task at 78 & 90 Forrest St, Jersey City, New Jersey.

Field ID	Laboratory ID	Matrix	Fraction
MW27A-0.5	460-34209-1	Soil	Hexavalent Chromium, Total Chromium
MW27A-3.0	460-34209-2	Soil	Hexavalent Chromium, Total Chromium
MW25A-1.0	460-34209-3	Soil	Hexavalent Chromium, Total Chromium
MW25A-3.0	460-34209-4	Soil	Hexavalent Chromium, Total Chromium
MW27A-6.0X (Field duplicate for sample MW27A-6.0)	460-34209-5	Soil	Hexavalent Chromium, Total Chromium
MW27A-8.0	460-34209-6	Soil	Hexavalent Chromium, Total Chromium
MW27A-5.0	460-34209-7	Soil	Hexavalent Chromium, Total Chromium
MW27A-6.0	460-34209-8	Soil	Hexavalent Chromium, Total Chromium
EB120111 (Equipment Blank)	460-34209-9	Aqueous	Hexavalent Chromium, Total Chromium
MW24A-10.0	460-34209-10	Soil	Hexavalent Chromium, Total Chromium
MW24A-14.0	460-34209-11	Soil	Hexavalent Chromium, Total Chromium
MW24A-5.0	460-34209-12	Soil	Hexavalent Chromium, Total Chromium
MW24A-4.5	460-34209-13	Soil	Hexavalent Chromium, Total Chromium

The sample was collected following the procedures detailed in the Draft Work Scope and Budget Estimate for Site Inspection and Investigation Activities for 78 & 90 Forrest Street, Jersey City, New Jersey and the Field Sampling Plan/Quality Assurance Project Plan for Non-Residential and Residential Chromium Sites Hudson County, New Jersey (June 2010).

General Comments

The data package was complete. Quality control (QC) issues identified during validation are discussed below. Refer to the Soil Target Analyte Summary Hit List for a listing of all detected results, qualified results, and associated qualifications, where applicable.

Hexavalent Chromium

All QC requirements were met; therefore no data qualifications were required.

Total Chromium

All QC requirements were met; therefore no data qualifications were required.

Data Quality and Usability

In general, these data appear to be valid and may be used for decision-making purposes. No data were rejected or qualified.

Attachments

Attachment A Target Analyte Summary Hitlist(s)

Attachment B Data Validation Report Form

Attachment A

Target Analyte Summary Hitlist(s)

Soil Target Analyte Summary Hit List (Hexavalent Chromium)

Site Name Forrest Street Jersey City, NJ
Sampling Date December 1, 2011
Lab Name/ID TestAmerica, Edison, NJ
SDG No 460-34209
Sample Matrix Soil
Trip Blank ID NA
Field Blank ID EB120111

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
MW27A-0.5	460-34209-1	CHROMIUM (HEXAVALENT)	U	1.3 J	1.3 J	2.2		
MW27A-3.0	460-34209-2	CHROMIUM (HEXAVALENT)	U	1.1 J	1.1 J	2.3		
MW25A-1.0	460-34209-3	CHROMIUM (HEXAVALENT)	U	4.5	4.5	2.3		
MW25A-3.0	460-34209-4	CHROMIUM (HEXAVALENT)	U	U	U	2.4		
MW27A-6.0X	460-34209-5	CHROMIUM (HEXAVALENT)	U	U	U	2.4		
MW27A-8.0	460-34209-6	CHROMIUM (HEXAVALENT)	U	1.4 J	1.4 J	2.4		
MW27A-5.0	460-34209-7	CHROMIUM (HEXAVALENT)	U	U	U	2.3		
MW27A-6.0	460-34209-8	CHROMIUM (HEXAVALENT)	U	U	U	2.6		
MW24A-10.0	460-34209-10	CHROMIUM (HEXAVALENT)	U	20.2	20.2	2.2		
MW24A-14.0	460-34209-11	CHROMIUM (HEXAVALENT)	U	U	U	2.8		
MW24A-5.0	460-34209-12	CHROMIUM (HEXAVALENT)	U	U	U	2.4		
MW24A-4.5	460-34209-13	CHROMIUM (HEXAVALENT)	U	U	U	2.7		

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicate a nondetect result at the RL.

Soil Target Analyte Summary Hit List (Total Chromium)

Site Name Forrest Street, Jersey City, NJ
Sampling Date December 1, 2011
Lab Name/ID TestAmerica, Edison, NJ
SDG No 460-34209
Sample Matrix Soil
Trip Blank ID NA
Field Blank ID EB120111

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
MW27A-0.5	460-34209-1	CHROMIUM	U	216	216	1.1		
MW27A-3.0	460-34209-2	CHROMIUM	U	163	163	1.0		
MW25A-1.0	460-34209-3	CHROMIUM	U	12.3	12.3	1.1		
MW25A-3.0	460-34209-4	CHROMIUM	U	15.1	15.1	1.0		
MW27A-6.0X	460-34209-5	CHROMIUM	U	12.6	12.6	1.2		
MW27A-8.0	460-34209-6	CHROMIUM	U	118	118	1.1		
MW27A-5.0	460-34209-7	CHROMIUM	U	21.9	21.9	1.1		
MW27A-6.0	460-34209-8	CHROMIUM	U	13.3	13.3	1.3		
MW24A-10.0	460-34209-10	CHROMIUM	U	4520	4520	10.8		
MW24A-14.0	460-34209-11	CHROMIUM	U	35.2	35.2	1.2		
MW24A-5.0	460-34209-12	CHROMIUM	U	879	879	1.0		
MW24A-4.5	460-34209-13	CHROMIUM	U	45.5	45.5	1.3		

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicate a nondetect result at the RL.

Attachment B

Data Validation Report Form

Client Name: PPG Industries	Project Number: 60154801-6001A
Site Location: PPG- Forrest St	Project Manager: Robert Cataldo
Laboratory: TestAmerica, Edison, New Jersey	Limited or Full Validation (circle one)
Laboratory Job No: 460-34209	Date Checked: 03/14/12
Validator: Justin Webster	Peer: Lisa Krowitz

ITEM	YES	NO	N/A	COMMENTS
Sample results included?	x			12 Soils and 1 equipment blank
Reporting Limits met project requirements?	x			Soils - 2.2 mg/kg to 2.8 mg/kg
Field I.D. included?	x			Sample MW25A-1.0 was listed twice on the COC Sample MW25A-4.5 was not listed on the COC.
Laboratory I.D. included?	x			
Sample matrix included?	x			
Sample receipt temperature 2-6°C?	x			3.4°C
Signed COCs included?	x			
Date of sample collection included?	x			12/1/2011
Date of sample digestion included?	x			Soil: Hex Cr prepped on 12/7/11. ORP was leached and analyzed on 12/21/11, ferrous iron was leached on 12/06/11, sulfide was leached and prepped on 12/07/11, TOC was analyzed on 12/06/11.
Holding time to digestion met criteria? Soils -30 days from collection to digestion.	x			See below " Holding Times"
Date of analysis included?	x			<u>Soil</u> : Hex Cr analyzed on 12/12/11, ORP was analyzed on 12/21/11, ferrous iron on 12/20/11, sulfide on 12/7/11, TOC on 12/6/11, and pH on 12/21/11 <u>Aqs</u> : HxCr analyzed on 12/1/11 @ 1544, pH on 12/6/11
Holding time to analysis met criteria? Soils -168 hours from digestion to analysis. Aqueous – 24 hours from collection to analysis.	x			
Method reference included?	x			3060A/7196A
Laboratory Case Narrative included?	x			
Definitions: MDL – Method Detection Limit; %R – Percent Recovery; RL – Reporting Limit; RPD – Relative Percent Difference; RSD – Relative Standard Deviation :Corr – Correlation Coefficient.				
Comments				
Field Duplicates: MW27A-6.0 and MW27A-6.0X were selected as the field duplicates for this data set. The sample results for MW27A-6.0 and MW27A-6.0X were reported as nondetect; therefore, precision was deemed acceptable.				

Sample dilutions: Dilutions were not performed on the samples in this SDG.

ITEM	YES	NO	N/A	COMMENTS
Initial Calibration Documentation Included in Lab Package?	x			Cal source (aqc WThcrIM2-00028) (soil WThcrIM-00030)
1. Blank plus 4 standards (7196A) or blank plus 3 standards (7199), 2. Correlation coefficient of ≥ 0.995 (7196A) or ≥ 0.999 (7199). 3. Calibrate daily or each time instrument is set up.	x x x			1. Each analysis 1 blank and 5 cal STDs 2. All analyses meet CC 3. Yes
Calibration Check Standard (CCS) for 7196A and Quality Control Sample (QCS) for 7199 Included in Lab Package?	x			Check source (aqc WThcrIM4-00027) (soils WThcrIM3-00014)
1. %R criteria met? (90 - 110%). 2. Correct frequency of once every 10 samples 3. CCS and QCS from independent source and at mid level of calibration curve.	x x x			1. All met %R 2. Analyzed every 10 samples 3. Yes
Calibration Blanks	x			Aqs: 460-94817/1. Soils 460-95615/1
1. Analyzed prior to initial calibration standards and after each CCS/QCS? 2. Absolute value should not exceed MDL.	x x			1. Yes 2. Yes
Method Blank and Field Blanks Included in Lab Package?	x			Equipment Blank EB120111 was ND.
1. Method blank analyzed with each preparation batch? 2. Absolute value should not exceed MDL.	x x			1. Yes, aqs – 460-94817/9. Soils –460- 95211/1-A 2. Yes, all blanks were less than MDL.
Eh and pH data .	x			
Eh and pH data was included and plotted for all samples?	x			
Soluble Matrix Spike Data Included in Lab Package?	x			460-34209-6 [MW27A-8.0]
1. %R criteria met? (75-125%R). 2. Was the spike concentration 40 mg/Kg? 3. Was a sample spiked at the frequency of 1/batch or 20 samples?	x x x			1. Yes, batch 95615 = 79 % 2. 48.7 mg/kg was used. 3. Yes for all batches.
Insoluble Matrix Spike Data Included in Lab Package?	x			460-34209-6 [MW27A-8.0]
1. %R criteria met? (75-125%R). 2. Was the spike concentration 400 to 800 mg/Kg? 3. Was a sample spiked at the frequency of 1/batch or 20 samples?	x x x			1. Yes, batch 95615 = 94% 2. Yes, 861 mg/kg was used. 3. Yes for all batches.
Post Digestion Spike	x			460-34209-6 [MW27A-8.0]
1. %R criteria met? (85-115%R). 2. Was the spike concentration 40 mg/Kg or twice the sample concentration? 3. Was a sample spiked at the frequency of 1/batch or 20 samples?	x x x			1. Yes, batch 95615 = 97% 2. Yes, 47.1 mg/kg was used. 3. Yes for all batches.
Sample Duplicate Data Included in Lab Package?	x			460-34209-6 [MW27A-8.0]
1. RPD criteria met? (RPD < 20%) of both results are $\geq 4x$ RL or control limit of $\pm RL$ if both results are $< 4x$ RL. 2. Was a sample spiked at the frequency of 1/batch or 20 samples?	x x			1. The laboratory duplicate analysis for batch 95615 was deemed acceptable for sample results $< 4x$ the RL and within $\pm RL$. 2. Yes
Was a Laboratory Control Sample (LCS) Included in Lab Package?	x			
1. %R criteria met? (80-120%R). 2. Was an LCS analyzed at the frequency of 1/batch or 20 samples?	x x			1. Yes, batch 95615 soluble = 100% and insoluble = 97%. 2. Yes
Miscellaneous Items.				
1. For soils by 7196A, was the pH within a range of 7.0-8.0? 2. For soils by 7199, was the pH within a range of 9.0-9.5? 3. For aqueous by 7196A, was the pH with a range of 1.5-2.5? 4. For soils (3060A), was the digestion temperature 90-95°C for at least 60 minutes? 5. For 7199, was each sample injected twice and was the RPD ≤ 20 ?	x x x x		x x	1. Yes 2. NA 3. Yes 4. Yes 5. NA

SDG#: 460-34209
Batch 95615
 Cr+6 ICAL -12/12/2011
 Soils
 (p. 719 of data pkg)

x - concentration	y - response
0	0
50	0.043
100	0.085
500	0.404
750	0.596
1250	1.002

(p. 719 of data pkg)

AECOM Calculated Intercept	-3.091	OK	Reported intercept	-3.091
AECOM Slope	1253	OK	Reported Slope	1253
AECOM Calculated r	1.000	OK	Reported r	1.000

LCS calculation **LCSS 460-95211/2-A pg. 399 and 719**

LCS Soluble Instrument Response 0.262
 Instrument Concentration (ug/L) 325.153
 Sample weight 2.5
 Percent solids 1
 Dilution Factor 1

AECOM Calculated LCS Result (mg/Kg)	13.01	OK	Reported Result (mg/Kg)	13.01
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%R = Found/True*100 **pg. 399**

True Value (mg/kg) 13

AECOM Calculated %R	100.0	OK	Reported %R	100
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MS calculation **MSI [MW27A-8.0] pgs. 390 and 719**

MS Insoluble Instrument Response 0
 Total absorbance - background 0.268
 Instrument Concentration (ug/L) 332.670
 Sample weight (g) 2.5
 Percent solids 0.822
 Dilution Factor 50

AECOM Calculated MS Result (mg/Kg)	809.4	OK rounding	Reported Result (mg/Kg)	809.3
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%R = Found/True*100 **pg. 390**

True Value (mg/kg) 861
 Native concentration (g) 1.4 J

%R	93.8	OK rounding	Reported %R	94
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Percent Solids for sample MW27A-8.0 **pg. 725**

Empty dish weight= 0.99
 Wet weight= 6.22
 Dry weight= 5.29

AECOM%solids =	82.2	OK	TestAmerica reported %solids=	82.2
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Reporting limit calculation MW27A-8.0 **pg. 31 and 719**

Low Standard 50
 Initial weight (g) 2.5
 Final volume (mL) 100
 Percent solids 0.82
 Dilution Factor 1.00

Reporting Limit	2.4	OK	Reported RL (mg/Kg)=	2.4
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Sample Calculations

MW27A-0.5 **pg. 26 and 719**

Background reading	0.002
Total absorbance	0.028
Total absorbance - background	0.026
Instrument Response (mg/L)	29.483
Sample weight (g)	2.57
Final Volume (mL)	100
Percent solids	0.876
Dilution Factor	1

AECOM Calculated Result (mg/Kg)	1.3	OK	Reported Result (mg/Kg)	1.3	J
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MW27A-3.0 **pg. 27 and 719**

Background reading	0
Total absorbance	0.021
Total absorbance - background	0.021
Instrument Response (mg/L)	23.219
Sample weight (g)	2.45
Final Volume (mL)	100
Percent solids	0.874
Dilution Factor	1

AECOM Calculated Result (mg/Kg)	1.1	OK	Reported Result (mg/Kg)	1.1	J
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MW25A-1.0 **pg. 28 and 719**

Background reading	0.002
Total absorbance	0.083
Total absorbance - background	0.081
Instrument Response (mg/L)	98.389
Sample weight (g)	2.51
Final Volume (mL)	100
Percent solids	0.872
Dilution Factor	1

AECOM Calculated Result (mg/Kg)	4.5	OK	Reported Result (mg/Kg)	4.5	J
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MW25A-3.0 **pg. 29 and 719**

Background reading	0
Total absorbance	0.006
Total absorbance - background	0.006
Instrument Response (mg/L)	4.426
Sample weight (g)	2.42
Final Volume (mL)	100
Percent solids	0.869
Dilution Factor	1

AECOM Calculated Result (mg/Kg)	0.2	OK ND	Reported Result (mg/Kg)	2.4	U
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MW27A-6.0X **pg. 30 and 719**

Background reading	0
Total absorbance	0.004
Total absorbance - background	0.004
Instrument Response (mg/L)	1.921
Sample weight (g)	2.56
Final Volume (mL)	100
Percent solids	0.817
Dilution Factor	1

AECOM Calculated Result (mg/Kg)	0.1	OK ND	Reported Result (mg/Kg)	2.4	U
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MW27A-8.0 **pg. 31 and 719**

AECOM

Background reading	0.002		
Total absorbance	0.028		
Total absorbance - background	0.026		
Instrument Response (mg/L)	29.483		
Sample weight (g)	2.5		
Final Volume (mL)	100		
Percent solids	0.822		
Dilution Factor	1		
AECOM Calculated Result (mg/Kg)	1.4	OK	Reported Result (mg/Kg) 1.4 J

MW27A-5.0 **pg. 32 and 720**

Background reading	0		
Total absorbance	0.002		
Total absorbance - background	0.002		
Instrument Response (mg/L)	-0.585		
Sample weight (g)	2.49		
Final Volume (mL)	100		
Percent solids	0.875		
Dilution Factor	1		
AECOM Calculated Result (mg/Kg)	0.0	OK ND	Reported Result (mg/Kg) 2.3 U

MW27A-6.0 **pg. 33 and 720**

Background reading	0		
Total absorbance	0.002		
Total absorbance - background	0.002		
Instrument Response (mg/L)	-0.585		
Sample weight (g)	2.41		
Final Volume (mL)	100		
Percent solids	0.862		
Dilution Factor	1		
AECOM Calculated Result (mg/Kg)	0.0	OK ND	Reported Result (mg/Kg) 2.6 U

MW24A-10.0 **pg. 34 and 720**

Background reading	0.002		
Total absorbance	0.365		
Total absorbance - background	0.363		
Instrument Response (mg/L)	451.689		
Sample weight (g)	2.59		
Final Volume (mL)	100		
Percent solids	0.862		
Dilution Factor	1		
AECOM Calculated Result (mg/Kg)	20.2	OK	Reported Result (mg/Kg) 20.2

MW24A-14.0 **pg. 35 and 720**

Background reading	0.376		
Total absorbance	0.316		
Total absorbance - background	-0.06		
Instrument Response (mg/L)	-78.261		
Sample weight (g)	2.4		
Final Volume (mL)	100		
Percent solids	74.1		
Dilution Factor	1		
AECOM Calculated Result (mg/Kg)	0.0	OK ND	Reported Result (mg/Kg) 2.8 U

AECOM

MW24A-5.0

pg. 36 and 720

Background reading	0.009		
Total absorbance	0.014		
Total absorbance - background	0.005		
Instrument Response (mg/L)	3.174		
Sample weight (g)	2.45		
Final Volume (mL)	100		
Percent solids	0.85		
Dilution Factor	1		
AECOM Calculated Result (mg/Kg)	0.2	OK ND	Reported Result (mg/Kg) 2.4 U

MW24A-4.5

pg. 36 and 720

Background reading	0.009		
Total absorbance	0.013		
Total absorbance - background	0.004		
Instrument Response (mg/L)	1.921		
Sample weight (g)	2.48		
Final Volume (mL)	100		
Percent solids	0.738		
Dilution Factor	1		
AECOM Calculated Result (mg/Kg)	0.1	OK ND	Reported Result (mg/Kg) 2.7 U

Client Name: PPG Industries	Project Number: 60154801-6001A
Site Location: PPG Forrest St	Project Manager: Robert Cataldo
Laboratory: TestAmerica, Edison, New Jersey	Limited or Full Validation (circle one)
Laboratory Job No: 460-34209	Date Checked: 03/14/12
Validator: Justin Webster	Peer Review: Lisa Krowitz

ITEM	YES	NO	N/A	COMMENTS
Sample results included?	X			
Reporting Limits met project requirements?	X			
Field I.D. included?	X			
Laboratory I.D. included?	X			
Sample matrix included?	X			
Sample receipt temperature 2-6°C?	X			3.4°C
Signed COCs included?	X			
Date of sample collection included?	X			12/1/11
Date of sample digestion included?	X			Soil: Samples were prepared on 12/2/11 Aqs: EB sample was prepped on 12/6/11
Date of analysis included?	X			Soil: Samples were analyzed on 12/7/11 and 12/8/11. Aqs: EB sample was analyzed on 12/7/11.
Holding time met QC criteria? Metals -180 days from sample collection Mercury – 28 days from sample collection If HT exceeded by - ≤ 10 days, J/UJ all results - > 10 days, R all results	X			All holding times were met.
Method reference included?	X			SW846 3010A/3050B/6020
Laboratory Case Narrative included?	X			
Sample Dilutions	X			Sample MW24A-10.0 was analyzed at 200x. All remaining soil samples from this SDG were analyzed at a 20x dilution. The aqs EB sample was analyzed at a 5x dilution.
Field Duplicates ("x" appended to sample ID) (RPD calculation on separate sheet)	x			Sample MW27A-6.0X was submitted as the field duplicate for sample MW27A-6.0. The RPD was 5% and within QC criteria.
Definitions: MDL – Method Detection Limit; %R – Percent Recovery; RL – Reporting Limit; RPD – Relative Percent Difference; RSD – Relative Standard Deviation ;Corr – Correlation Coefficient.				
Comments				

ITEM	YES	NO	N/A	COMMENTS
Initial Calibration Documentation Included in Lab Package?			x	Not reviewed for limited validation
1. Calibrate daily or each time instrument is set up?. If no, reject (R) data. 2. ICP (6010) - Blank plus 1standard? If no, reject (R) data. 3. Hg (7470/7471) – Blank plus 5 standards? If no, reject (R) data.				
Initial Calibration Verification Standard (ICV) for ICP (6010) and Initial Calibration Check Standard (ICCS) for Hg (7470/7471) Included in Lab Package?			x	Not reviewed for limited validation
1. Analyzed immediately after initial calibration? If no, reject (R) data. 2. %R criteria met? (90 - 110%). If no, J positive results for affected analyte(s) if %R between 80-89% and 111-120% and indicate bias UJ non-detect results for affected analyte(s) if %R between 80-89% R all data for affected analyte(s) if <80% or >120% 3. Spot check ICV/ICCS results for several analytes				
Continuing Calibration Verification Standard (CCV) for ICP (6010) and Calibration Check Standard (CCS) for Hg (7470/7471) included in Lab Package?			x	Not reviewed for limited validation
1. Analyzed immediately after each ICV/ICC/CB and after every 10 samples? If no, reject (R) data. 2. CCS and CCV from independent source and at mid level of calibration curve. If no, reject (R) data. 3. %R criteria met? (90 - 110%) If no, J positive results for affected analyte(s) if %R between 80-89% and 111-120% and indicate bias UJ non-detect results for affected analyte(s) if %R between 80-89% R all data for affected analyte(s) if %R <80% or >120% 4. Spot check CCV/CCS results for several analytes				
Low Calibration Standard (CRI) included in Lab Package?			x	Not reviewed for limited validation
1. %R criteria met? - 50 - 150% for Co, Mn, Zn by ICP-MS, PB, TI by 6010) - 70-130% all others If no, refer to ILM05.4 NJ SOP 5.A.2 for actions.				
Calibration Blanks			x	Not reviewed for limited validation
1. Analyzed immediately after daily calibration and after each ICV/ICC/CCV/CCS, and after every 10 samples? If no, reject (R) data. 2. Absolute value $\leq 3 \times \text{IDL}$? If no, - if sample result $\leq 10 \times \text{CB}$ result, qualify affected analyte(s) in associated samples with CB - if sample result $> 10 \times \text{CB}$ result, no qualification				
Method Blank included in Lab Package?	x			
1. Method blank analyzed with each preparation batch or every SDG, or 1/20 samples? If no, reject (R) data, except no aqueous MB required for FB/EB if only soil samples were analyzed. 2. Method blank analyzed 1/20 samples? If - MB 1/25, J sample results from 21-25 - MB > 1/25, R sample results after 25 th sample 3. MB result nondetect? If no, - Sample result $\leq 3 \times \text{MB}$, negate UB - Sample result $< 3 \times \text{MB}$, but $\leq 10 \times \text{MB}$, JB - Sample result $> 10 \times \text{MB}$, no qualification 4. Negative MB result reported? If yes, - Positive sample result $\leq 10 \times \text{MB}$, qualify estimated, biased low (J) - Non-detect sample result, qualify UJ, may be false non-detect	x			1. Yes, all frequency criteria were met. 2. Yes 3. Yes 4. No
Field Blanks/Equipment Blanks included in Lab Package?	x			Blanks apply to samples collected during same week as blank
1, FB/EB result nondetect? If no, - Sample result $\leq 3 \times \text{FB/EB}$, negate U - Sample result $< 3 \times \text{FB/EB}$, but $\leq 10 \times \text{FB/EB}$, J - Sample result $> 10 \times \text{FB/EB}$, no qualification	x			Equipment Blank EB120111 was nondetect.

ITEM	YES	NO	N/A	COMMENTS
ICP Interference Check Sample (ICS) included in Lab Package?			x	Not reviewed for limited validation
1. Analyzed at beginning of analytical run? If no, reject (R) data. 2. %R criteria met? (80-120%) If no, %R > 120%, no qualification if sample result non-detect %R between 121-150%, J positive results, biased high %R between 50-79%, J/UJ results, biased low %R <50% or >150%, reject (R) result 3. Spot check accuracy of %Rs				
Matrix Spike/Matrix Spike Duplicate Data Included in Lab Package?	x			Sample MW27A-8.0 was used as the QC source for the soil analysis. Aqs analysis used batch QC.
1. MS/MSD %R (75-125%R) and RPD ($\pm 20\%$) criteria met? - %R >125% J positive results for affected analyte(s) for all samples in the same batch/SDG, accept NDs. - %R <75% J/UJ for affected analyte(s) for all samples in the same batch/SDG - RPD outside $\pm 20\%$ J positive results for affected analyte(s) for all samples in the same batch/SDG, accept NDs. 2. Was a sample spiked at the frequency of 1/batch or 20 samples? 3. Was the MS performed on a site sample? 4. Was the MS performed on a FB/EB or TB? If yes, J all sample data.	x x	x		1. Yes, The MS result for sample MW27A-8.0 was low -111%, however the native sample concentration was greater than 4 times the spike concentration. No data qualifications were required. 2. Yes, all frequency requirements were met. 3. Yes, MW27A-8.0. 4. No
Serial Dilution			x	Not reviewed for limited validation
1. %D ($\leq 10\%$ R) criteria met? - If analyte concentration > 25xIDL (7000) or > 10x IDL (6010) and %D > 10% J positive results for affected analyte(s) for all samples in the same batch/SDG, accept NDs. 2. Was the frequency 1/batch or 20 samples? 3. Was a site sample used? 4. Was a FB/EB or TB used? If yes, J all sample data. 5. Spot check accuracy of %Ds				
Post Digestion Spike			x	Not reviewed for limited validation
1. %R criteria met? (75-125%R). - %R >125% J positive results for affected analyte(s) for all samples in the same batch/SDG, accept NDs. - %R <75% J/UJ affected analyte(s) for all samples in the same batch/SDG. 2. Was the spike performed on a FB/EB or TB? If yes, J all sample data? 3. Was a sample spiked at the frequency of 1/batch or 20 samples?				
Laboratory Control Sample Data Included in Lab Package?	x			
1. LCS %R (80-120%R) criteria met? If no, J/UJ all affected analyte(s) for all samples in the same batch/SDG. data. 2. Was a sample spiked at the frequency of 1/batch or 20 samples? If no, J/UJ affected analyte(s) for all sample in the same batch/SDG.	x x			1. Yes, all LCS recoveries met applicable quality control criteria. 2. Yes
Laboratory Duplicate Data Included in Lab Package?	x			Sample MW26A-8.0 from this SDG and sample MW27A-8.0 from SDG 460-34209.
<u>Aqueous</u> If RPD is >20% but <100% and sample and field duplicate results are >5x the QL, estimate (J) results > the QL. If RPD is >100%, reject (R) results \geq the QL. If sample and/or duplicate is <5x the QL and absolute difference is > the QL, estimate (J) positive results <5x the QL and nondetects (UJ). If absolute difference is > 2x the QL, reject (R) non detects and positive results <5x the QL. <u>SOIL:</u> If RPD is >35% but <120% and sample and field duplicate results are >5x the QL, estimate (J) results > the QL. If RPD is > 120%, reject (R) results > the QL. If sample and/or duplicate is <5x the QL and absolute difference is >2x the QL, estimate (J) positive results <5x QL and nondetects (UJ). If absolute difference is >4x the QL, reject (R) non detects and positive results <5x QL.	x		x	<u>Aqs:</u> A non-site sample was used as the source for the QC analysis. Data qualifications are not applicable for non-site sample. <u>Soil:</u> Sample MW27A-8.0 from SDG 460-34209 exceeded lab QC criteria of < 20% but was within NJDEP criteria of < 35% for sample results > 5xRL. No data qualifications were required.

ITEM	YES	NO	N/A	COMMENTS
Field Duplicate Data Included in Lab Package?	x			Sample MW27A-6.0X was the field duplicate for sample MW27A-6.0
<p><u>Aqueous</u></p> <p>If RPD is >20% but <100% and sample and field duplicate results are >5x the QL, estimate (J) results > the QL. If RPD is >100%, reject (R) results ≥ the QL. If sample and/or duplicate is <5x the QL and absolute difference is > the QL, estimate (J) positive results <5x the QL and nondetects (UJ). If absolute difference is > 2x the QL, reject (R) non detects and positive results <5x the QL.</p> <p><u>SOIL:</u></p> <p>If RPD is >35% but <120% and sample and field duplicate results are >5x the QL, estimate (J) results > the QL. If RPD is > 120%, reject (R) results > the QL. If sample and/or duplicate is <5x the QL and absolute difference is >2x the QL, estimate (J) positive results <5x QL and nondetects (UJ). - If absolute difference is >4x the QL, reject (R) non detects and positive results <5x QL.</p>	x		x	The RPD criteria was met with a result of 5% and within the QC criteria of < 35%.

Holding Time

Sample ID	Method	Days from Sampling to Prep	Days from Prep to Analysis	Days from Sampling to Analysis	Sampling to Prep Status	Prep to Analysis Status	Sampling to Analysis Status
EB120111	SW6020	5	1	6			OK @180 days
MW24A-10.0	SW6020	1	6	7			OK @180 days
MW24A-14.0	SW6020	1	6	7			OK @180 days
MW24A-5.0	SW6020	1	6	7			OK @180 days
MW25A-1.0	SW6020	1	6	7			OK @180 days
MW25A-3.0	SW6020	1	6	7			OK @180 days
MW25A-4.5	SW6020	1	6	7			OK @180 days
MW27A-0.5	SW6020	1	5	6			OK @180 days
MW27A-3.0	SW6020	1	6	7			OK @180 days
MW27A-5.0	SW6020	1	6	7			OK @180 days
MW27A-6.0	SW6020	1	6	7			OK @180 days
MW27A-6.0X	SW6020	1	6	7			OK @180 days
MW27A-8.0	SW6020	1	5	6			OK @180 days
EB120111	SW7196			1			OK @1 days
MW24A-10.0	SW7196	6	5	11	OK @30 days	OK @7 days	OK @37 days
MW24A-14.0	SW7196	6	5	11	OK @30 days	OK @7 days	OK @37 days
MW24A-5.0	SW7196	6	5	11	OK @30 days	OK @7 days	OK @37 days
MW25A-1.0	SW7196	6	5	11	OK @30 days	OK @7 days	OK @37 days
MW25A-3.0	SW7196	6	5	11	OK @30 days	OK @7 days	OK @37 days
MW25A-4.5	SW7196	6	5	11	OK @30 days	OK @7 days	OK @37 days
MW27A-0.5	SW7196	6	5	11	OK @30 days	OK @7 days	OK @37 days
MW27A-3.0	SW7196	6	5	11	OK @30 days	OK @7 days	OK @37 days
MW27A-5.0	SW7196	6	5	11	OK @30 days	OK @7 days	OK @37 days
MW27A-6.0	SW7196	6	5	11	OK @30 days	OK @7 days	OK @37 days
MW27A-6.0X	SW7196	6	5	11	OK @30 days	OK @7 days	OK @37 days
MW27A-8.0	SW7196	6	5	11	OK @30 days	OK @7 days	OK @37 days

Percent Solids

Sample ID	Percent Solids (%)	Status
MW24A-10.0	86.2	ok @30%
MW24A-14.0	74.1	ok @30%
MW24A-5.0	85	ok @30%
MW25A-1.0	87.2	ok @30%
MW25A-3.0	86.9	ok @30%
MW25A-4.5	73.8	ok @30%
MW27A-0.5	87.6	ok @30%
MW27A-3.0	87.4	ok @30%
MW27A-5.0	87.5	ok @30%
MW27A-6.0	79.6	ok @30%
MW27A-6.0X	81.7	ok @30%
MW27A-8.0	82.2	ok @30%

Data Validation Report

Project:	PPG Forrest St
Laboratory:	TestAmerica, Edison, NJ
Laboratory Job No.:	460-36375
Analysis/Method:	Hexavalent Chromium SW846 3060A/7196A TAL Metals SW846 3010A/3050B/6020/7470A/7471A
Validation Level:	Full (Hexavalent Chromium) Limited (TAL Metals)
Site Location/Address:	78 & 90 Forrest St, Jersey City, NJ
AECOM Project Number:	60154801-6001A
Prepared by: Justin Webster/AECOM	Completed on: March 8, 2012
Reviewed by: Lisa Krowitz/AECOM	File Name: 2012-03-08 HxCr_Metal DV Report 460-36375-F.docx

Introduction

The data were reviewed in accordance with the FSP-QAPP and the following NJDEP validation Standard Operating Procedures (SOP):

- NJDEP Office of Data Quality SOP 5.A.10, Rev 3 (September 2009), SOP for Analytical Data Validation of Hexavalent Chromium – for USEPA SW-846 Method 3060A, USEPA SW-846 Method 7196A and USEPA SW-846 Method 7199
- NJDEP Office of Data Quality SOP 5.A.16, Rev 1 (May 2002), Quality Assurance Data Validation of Analytical Deliverables for Inorganics (based on USEPA SW-846 Methods).

The results of quality control data analyzed with site samples were used to assess the overall reliability of the data. The following qualifiers were used to identify data quality issues:

- U: Indicates the analyte was not detected in the sample above the sample reporting limit.
- J: Indicates the result was an estimated value; the associated numerical value was an approximate concentration of the analyte in the sample.
- UJ: Indicates the analyte was not detected above the reporting limit and the reporting limit was approximate.
- R: The sample result was rejected due to serious deficiencies; the presence or absence of the analyte could not be confirmed.

Sample Information

The samples listed below were collected by AECOM on February 1, 2012 as part of the Forrest Street task at 78 & 90 Forrest St, Jersey City, New Jersey.

Field ID	Laboratory ID	Matrix	Fraction
ICO-23-0.3	460-36375-1	Soil	Hexavalent Chromium, TAL Metals
ICO-23-2.0	460-36375-2	Soil	Hexavalent Chromium, TAL Metals
ICO-23-4.0	460-36375-3	Soil	Hexavalent Chromium, TAL Metals
ICO-23-6.0	460-36375-4	Soil	Hexavalent Chromium, TAL Metals
ICO-23-8.0	460-36375-5	Soil	Hexavalent Chromium, TAL Metals
ICO-23-10.0	460-36375-6	Soil	Hexavalent Chromium, TAL Metals
FB020112 (Field blank)	460-36375-7	Aqueous	Hexavalent Chromium, TAL Metals

The sample was collected following the procedures detailed in the Draft Work Scope and Budget Estimate for Site Inspection and Investigation Activities for 78 & 90 Forrest Street, Jersey City, New Jersey and the Field Sampling Plan/Quality Assurance Project Plan for Non-Residential and Residential Chromium Sites Hudson County, New Jersey (June 2010).

General Comments

The data package was complete. Quality control (QC) issues identified during validation are discussed below. Refer to the Soil Target Analyte Summary Hit List for a listing of all detected results, qualified results, and associated qualifications, where applicable.

Hexavalent Chromium

All QC requirements were met; therefore no data qualifications were required.

Total Chromium

Laboratory Duplicate Precision

Sample ICO-23-10.0 was selected to demonstrate laboratory precision capability. The relative percent difference (RPD) for lead (35%), zinc (131%), and calcium (127%) exceeded the acceptable precision criteria of less than 35 percent RPD for sample results greater than five times the reporting limit; therefore, the calcium, lead, and zinc results for all soil samples from this SDG were qualified as estimated (J), with potential for unknown bias, due to poor laboratory duplicate precision.

Reporting Limits

The reporting limits for the nondetect silver results in all soil samples from this SDG exceeded the Direct Impact to Groundwater standard (DIGWSSL) due to a 20 time dilution factor.

Laboratory Control Sample (LCS) Results

The LCS recovery for aluminum was (71%), which met the certified LCS recovery criteria of 45-154%, but failed the NJDEP LCS recovery criteria of 80-120%R; therefore, all soil sample results for aluminum from this SDG were qualified as estimated (J) with potential for biased low results.

Data Quality and Usability

In general, these data appear to be valid and may be used for decision-making purposes. No data were rejected. Qualified results, if applicable, are discussed in attachments A and B below.

The detect lead, zinc, and calcium results in all soil samples were estimated with an unknown bias due to poor laboratory precision.

The detect aluminum soil results in all soil samples were estimated, bias low due to low LCS recovery.

Attachments

Attachment A Target Analyte Summary Hitlist(s)

Attachment B Data Validation Report Form

Attachment A

Target Analyte Summary Hitlist(s)

Soil Target Analyte Summary Hit List (Hexavalent Chromium)

Site Name 78 & 90 Forrest St, Jersey City, NJ
Sampling Date February 1, 2012
Lab Name/ID TestAmerica, Edison, NJ
SDG No 460-36375
Sample Matrix Soil
Trip Blank ID NA
Field Blank ID FB020112

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
ICO-23-0.3	460-36375-1	CHROMIUM (HEXAVALENT)	U	6.2	6.2	2.4		
ICO-23-2.0	460-36375-2	CHROMIUM (HEXAVALENT)	U	2.8	2.8	2.5		
ICO-23-4.0	460-36375-3	CHROMIUM (HEXAVALENT)	U	9.4	9.4	2.9		
ICO-23-6.0	460-36375-4	CHROMIUM (HEXAVALENT)	U	1.5	1.5	2.4		

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicate a nondetect result at the RL.

NJDEP Laboratory Footnote

1. The value reported is less than or equal to 3x the value in the preparation/reagent blank. It is the policy of NJDEP-DPFSR to negate the reported value due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
2. The value reported is greater than three (3) times but less than ten (10) times the value in the preparation/reagent blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to the preparation/reagent blank contamination. The "B" qualifier alerts the end-user to the presence of this analyte in the preparation/reagent blank.
3. The value reported is less than or equal to three (3) times the value in the trip/field blank. It is the policy of NJDEP-DPFSR to negate the reported value as due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.

4. The value reported is greater than three (3) times but less than ten (10) times the value in the trip/field blanks and is considered "real". However, the reported value must be quantitatively qualified "J" due to trip/field blank contamination.
5. The concentration reported by the laboratory is incorrectly calculated.
6. The laboratory failed to report the presence of the analyte in the sample.
7. The reported Hexavalent Chromium value was qualified because the Calibration Check Standard was not within the recovery range (90-110 percent).
8. In the Duplicate Sample Analysis, Hexavalent Chromium fell outside the control limits of ± 20 percent for sample results $> 4xRL$ or $\pm RL$ for sample results $< 4xRL$. Therefore, the result was qualified.
9. This analyte was rejected because the laboratory performed the Duplicate Analysis on a field blank.
10. The reported value was qualified because the PVS recovery was greater than 115 percent.
11. The reported value was qualified because the PVS recovery was less than 85 percent.
12. The non-detected value was qualified (UJ) because the PVS recovery was less than 85 percent. The possibility of a false negative exists.
13. The reported analyte was qualified because the associated Calibration Blank result was greater than the MDL.
14. The laboratory made a transcription error. No hits were found in the raw data.
15. This analyte is rejected because the laboratory exceeded the holding time for digestion and analysis.
16. The laboratory subtracted the preparation/reagent blank from the sample result. The Reviewer's calculation puts the preparation/reagent blank back into the result.
17. The photocopy is unreadable. Therefore, the QA reviewer cannot read the laboratory's reported concentration result.
18. The reported value was qualified because the soluble predigestion spike recovery was less than 75 percent, but greater than 50%.
19. The reported value was qualified because the predigestion spike recovery was greater than 125 percent.
20. The non-detected value was qualified (UJ) because the redigestion spike recovery was less than 75 percent. The possibility of a false negative exists.

21. The reported result was qualified or rejected because the laboratory did not record the pH value(s) of the sample in a laboratory notebook.
22. The reported value was qualified (J/UJ) because the sample moisture content exceeded 30 percent.
23. The sample result was rejected because the soluble and insoluble matrix spike recoveries were less than 50%.

Soil Target Analyte Summary Hit List (TAL Metals)

Site Name 78 & 90 Forrest St, Jersey City, NJ
Sampling Date February 1, 2012
Lab Name/ID TestAmerica, Edison, NJ
SDG No 460-36375
Sample Matrix Soil
Trip Blank ID NA
Field Blank ID FB020112

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
ICO-23-0.3	460-36375-1	ALUMINUM	U	9250	9250	11.6	Qualify	20
ICO-23-0.3	460-36375-1	ANTIMONY	U	3.4	3.4	0.58		
ICO-23-0.3	460-36375-1	ARSENIC	U	13.1	13.1	0.58		
ICO-23-0.3	460-36375-1	BARIUM	U	486	486	1.2		
ICO-23-0.3	460-36375-1	BERYLLIUM	U	0.48	0.48	0.23		
ICO-23-0.3	460-36375-1	CADMIUM	U	5.0	5.0	0.58		
ICO-23-0.3	460-36375-1	CALCIUM METAL	U	67900	67900	58.0	Qualify	18
ICO-23-0.3	460-36375-1	CHROMIUM	U	298	298	1.2		
ICO-23-0.3	460-36375-1	COBALT	U	5.8	5.8	1.2		
ICO-23-0.3	460-36375-1	COPPER	U	43.2	43.2	1.2		
ICO-23-0.3	460-36375-1	IRON	U	21000	21000	34.8		
ICO-23-0.3	460-36375-1	LEAD	U	581	581	0.35	Qualify	18
ICO-23-0.3	460-36375-1	MAGNESIUM	U	5200	5200	58.0		
ICO-23-0.3	460-36375-1	MANGANESE	U	282	282	2.3		
ICO-23-0.3	460-36375-1	NICKEL	U	23.6	23.6	1.2		
ICO-23-0.3	460-36375-1	POTASSIUM	U	1390	1390	58.0		
ICO-23-0.3	460-36375-1	SELENIUM	U	2.4	2.4	0.58		
ICO-23-0.3	460-36375-1	SODIUM	U	322	322	58.0		
ICO-23-0.3	460-36375-1	THALLIUM	U	0.27	0.27	0.23		
ICO-23-0.3	460-36375-1	VANADIUM	U	35.6	35.6	1.2		

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
ICO-23-0.3	460-36375-1	ZINC	U	1460	1460	23.2	Qualify	18
ICO-23-2.0	460-36375-2	ALUMINUM	U	5300	5300	12.4	Qualify	20
ICO-23-2.0	460-36375-2	ANTIMONY	U	1.1	1.1	0.62		
ICO-23-2.0	460-36375-2	ARSENIC	U	9.2	9.2	0.62		
ICO-23-2.0	460-36375-2	BARIUM	U	323	323	1.2		
ICO-23-2.0	460-36375-2	BERYLLIUM	U	0.53	0.53	0.25		
ICO-23-2.0	460-36375-2	CADMIUM	U	2.3	2.3	0.62		
ICO-23-2.0	460-36375-2	CALCIUM METAL	U	24900	24900	62.1	Qualify	18
ICO-23-2.0	460-36375-2	CHROMIUM	U	74.9	74.9	1.2		
ICO-23-2.0	460-36375-2	COBALT	U	4.7	4.7	1.2		
ICO-23-2.0	460-36375-2	COPPER	U	54.1	54.1	1.2		
ICO-23-2.0	460-36375-2	IRON	U	10300	10300	37.3		
ICO-23-2.0	460-36375-2	LEAD	U	128	128	0.37	Qualify	18
ICO-23-2.0	460-36375-2	MAGNESIUM	U	2240	2240	62.1		
ICO-23-2.0	460-36375-2	MANGANESE	U	160	160	2.5		
ICO-23-2.0	460-36375-2	NICKEL	U	13.8	13.8	1.2		
ICO-23-2.0	460-36375-2	POTASSIUM	U	515	515	62.1		
ICO-23-2.0	460-36375-2	SELENIUM	U	1.5	1.5	0.62		
ICO-23-2.0	460-36375-2	SODIUM	U	147	147	62.1		
ICO-23-2.0	460-36375-2	VANADIUM	U	16.7	16.7	1.2		
ICO-23-2.0	460-36375-2	ZINC	U	979	979	24.8	Qualify	18
ICO-23-2.0	460-36375-2	MERCURY	U	0.25	0.25	0.040		
ICO-23-4.0	460-36375-3	ZINC	U	2250	2250	57.3	Qualify	18
ICO-23-4.0	460-36375-3	ALUMINUM	U	6230	6230	14.3	Qualify	20
ICO-23-4.0	460-36375-3	ANTIMONY	U	2.2	2.2	0.72		
ICO-23-4.0	460-36375-3	ARSENIC	U	16.2	16.2	0.72		
ICO-23-4.0	460-36375-3	BARIUM	U	162	162	1.4		
ICO-23-4.0	460-36375-3	BERYLLIUM	U	0.50	0.50	0.29		
ICO-23-4.0	460-36375-3	CADMIUM	U	3.1	3.1	0.72		
ICO-23-4.0	460-36375-3	CALCIUM METAL	U	9930	9930	71.7	Qualify	18
ICO-23-4.0	460-36375-3	CHROMIUM	U	68.8	68.8	1.4		
ICO-23-4.0	460-36375-3	COBALT	U	5.2	5.2	1.4		
ICO-23-4.0	460-36375-3	COPPER	U	107	107	1.4		
ICO-23-4.0	460-36375-3	IRON	U	19800	19800	43.0		
ICO-23-4.0	460-36375-3	LEAD	U	541	541	0.43	Qualify	18

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
ICO-23-4.0	460-36375-3	MAGNESIUM	U	1780	1780	71.7		
ICO-23-4.0	460-36375-3	MANGANESE	U	201	201	2.9		
ICO-23-4.0	460-36375-3	NICKEL	U	23.3	23.3	1.4		
ICO-23-4.0	460-36375-3	POTASSIUM	U	437	437	71.7		
ICO-23-4.0	460-36375-3	SELENIUM	U	2.3	2.3	0.72		
ICO-23-4.0	460-36375-3	SODIUM	U	108	108	71.7		
ICO-23-4.0	460-36375-3	VANADIUM	U	17.3	17.3	1.4		
ICO-23-4.0	460-36375-3	MERCURY	U	1.0	1.0	0.047		
ICO-23-6.0	460-36375-4	ALUMINUM	U	11300	11300	12.2	Qualify	20
ICO-23-6.0	460-36375-4	ARSENIC	U	5.2	5.2	0.61		
ICO-23-6.0	460-36375-4	BARIUM	U	23.0	23.0	1.2		
ICO-23-6.0	460-36375-4	BERYLLIUM	U	0.47	0.47	0.24		
ICO-23-6.0	460-36375-4	CALCIUM METAL	U	968	968	61.2	Qualify	18
ICO-23-6.0	460-36375-4	CHROMIUM	U	13.5	13.5	1.2		
ICO-23-6.0	460-36375-4	COBALT	U	9.1	9.1	1.2		
ICO-23-6.0	460-36375-4	COPPER	U	24.2	24.2	1.2		
ICO-23-6.0	460-36375-4	IRON	U	19800	19800	36.7		
ICO-23-6.0	460-36375-4	LEAD	U	24.1	24.1	0.37	Qualify	18
ICO-23-6.0	460-36375-4	MAGNESIUM	U	3320	3320	61.2		
ICO-23-6.0	460-36375-4	MANGANESE	U	374	374	2.4		
ICO-23-6.0	460-36375-4	NICKEL	U	15.0	15.0	1.2		
ICO-23-6.0	460-36375-4	POTASSIUM	U	578	578	61.2		
ICO-23-6.0	460-36375-4	SELENIUM	U	1.5	1.5	0.61		
ICO-23-6.0	460-36375-4	VANADIUM	U	17.7	17.7	1.2		
ICO-23-6.0	460-36375-4	ZINC	U	76.2	76.2	4.9	Qualify	18
ICO-23-6.0	460-36375-4	MERCURY	U	0.12	0.12	0.040		
ICO-23-8.0	460-36375-5	ALUMINUM	U	10300	10300	11.6	Qualify	20
ICO-23-8.0	460-36375-5	ARSENIC	U	3.5	3.5	0.58		
ICO-23-8.0	460-36375-5	BARIUM	U	33.0	33.0	1.2		
ICO-23-8.0	460-36375-5	BERYLLIUM	U	0.60	0.60	0.23		
ICO-23-8.0	460-36375-5	CALCIUM METAL	U	908	908	58.2	Qualify	18
ICO-23-8.0	460-36375-5	CHROMIUM	U	15.7	15.7	1.2		
ICO-23-8.0	460-36375-5	COBALT	U	10.3	10.3	1.2		
ICO-23-8.0	460-36375-5	COPPER	U	13.4	13.4	1.2		
ICO-23-8.0	460-36375-5	IRON	U	14200	14200	34.9		

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
ICO-23-8.0	460-36375-5	LEAD	U	17.0	17.0	0.35	Qualify	18
ICO-23-8.0	460-36375-5	MAGNESIUM	U	3190	3190	58.2		
ICO-23-8.0	460-36375-5	MANGANESE	U	276	276	2.3		
ICO-23-8.0	460-36375-5	NICKEL	U	11.8	11.8	1.2		
ICO-23-8.0	460-36375-5	POTASSIUM	U	1070	1070	58.2		
ICO-23-8.0	460-36375-5	SELENIUM	U	1.5	1.5	0.58		
ICO-23-8.0	460-36375-5	SODIUM	U	60.7	60.7	58.2		
ICO-23-8.0	460-36375-5	VANADIUM	U	24.8	24.8	1.2		
ICO-23-8.0	460-36375-5	ZINC	U	43.3	43.3	4.7	Qualify	18
ICO-23-10.0	460-36375-6	ALUMINUM	U	4220	4220	11.6	Qualify	20
ICO-23-10.0	460-36375-6	ARSENIC	U	1.9	1.9	0.58		
ICO-23-10.0	460-36375-6	BARIIUM	U	16.9	16.9	1.2		
ICO-23-10.0	460-36375-6	BERYLLIUM	U	0.31	0.31	0.23		
ICO-23-10.0	460-36375-6	CALCIUM METAL	U	673	673	57.8	Qualify	18
ICO-23-10.0	460-36375-6	CHROMIUM	U	6.4	6.4	1.2		
ICO-23-10.0	460-36375-6	COBALT	U	2.8	2.8	1.2		
ICO-23-10.0	460-36375-6	COPPER	U	6.4	6.4	1.2		
ICO-23-10.0	460-36375-6	IRON	U	6920	6920	34.7		
ICO-23-10.0	460-36375-6	LEAD	U	6.9	6.9	0.35	Qualify	18
ICO-23-10.0	460-36375-6	MAGNESIUM	U	1530	1530	57.8		
ICO-23-10.0	460-36375-6	MANGANESE	U	79.8	79.8	2.3		
ICO-23-10.0	460-36375-6	NICKEL	U	5.7	5.7	1.2		
ICO-23-10.0	460-36375-6	POTASSIUM	U	516	516	57.8		
ICO-23-10.0	460-36375-6	SELENIUM	U	0.95	0.95	0.58		
ICO-23-10.0	460-36375-6	VANADIUM	U	11.8	11.8	1.2		
ICO-23-10.0	460-36375-6	ZINC	U	25.6	25.6	4.6	Qualify	18
ICO-23-10.0	460-36375-6	MERCURY	U	0.054	0.054	0.038		

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicate a nondetect result at the RL.

NJDEP Laboratory Footnotes

1. The value reported is less than or equal to 3x the value in the method blank. It is the policy of NJDEP-DPFSR to negate the reported value due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
2. The value reported is greater than three (3) but less than ten (10) times the value in the method blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to the method blank contamination. The "B" qualifier alerts the end-user to the presence of this analyte in the method blank.
3. The value reported is less than or equal to 3x the value in the trip/field blank. It is the policy of NJDEP-DPFSR to negate the reported value as due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
4. The value reported is greater than 3x but less than ten (10) the value in the trip/field blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to trip/field blank contamination.
5. The concentration reported by the laboratory is incorrectly calculated.
6. The laboratory failed to report the presence of the analyte in the sample.
7. The reported metal value was qualified because the Calibration Verification Standard was not within the recovery range (90-110 percent).
8. In the MS/MSD Sample Analysis, this analyte fell outside the control limits of 20% RPD. Therefore, the result was qualified.
9. This analyte was qualified because the laboratory performed the MS/MSD Analysis on a field blank.
10. The reported analyte was qualified because the associated Calibration Blank result was greater than the MDL.
11. The reported value was qualified because serial dilution analysis was not within QC limit of 10% D.
12. This analyte is rejected because the laboratory exceeded the holding time for digestion and analysis.
13. The laboratory subtracted the method blank from the sample result. The reviewer's calculation has added the method blank result to the reported concentration.
14. The photocopy submitted is illegible. Therefore, the QA reviewer cannot read the laboratory's reported concentration result.
15. The reported or nondetected value was qualified because the MS/MSD spike recovery was less than 75 percent.

16. The reported value was qualified because the MS/MSD spike recovery was greater than 125 percent.
17. The non-detected value was qualified (UJ) because the MS/MSD spike recovery was less than 75 percent. The possibility of a false negative exists.
18. The reported values was qualified because the laboratory duplicate exceeded 35 percent RPD or the absolute difference exceeded two times the reporting limit for sample result less than 5 times the reporting limit.
19. The reported value was qualified because the field duplicate exceeded 35 percent RPD.
20. The percent moisture was greater than the QC acceptance criteria of 30%, thus the results were qualified as estimated (J/UJ).
21. The reported or nondetect value was qualified with an uncertain bias because the MS %R and MSD %R had opposing biases.

Attachment B

Data Validation Report Form

Client Name: PPG Industries	Project Number: 60154801-6001A
Site Location: PPG- Forrest St	Project Manager: Robert Cataldo
Laboratory: TestAmerica, Edison, New Jersey	Limited or <input checked="" type="checkbox"/> Full Validation (circle one)
Laboratory Job No: 460-36375	Date Checked: 03/08/2012
Validator: Justin Webster	Peer: Lisa Krowitz

ITEM	YES	NO	N/A	COMMENTS
Sample results included?	x			6 soil sample and 1 equipment blank.
Reporting Limits met project requirements?	x			
Field I.D. included?	x			
Laboratory I.D. included?	x			
Sample matrix included?	x			
Sample receipt temperature 2-6°C?	x			2.3°C
Signed COCs included?	x			
Date of sample collection included?	x			02/01/12
Date of sample digestion included?	x			Soil: HxCr prepped on 02/24/12.
Holding time to digestion met criteria? Soils -30 days from collection to digestion.	x			
Date of analysis included?	x			Soil: HxCr analyzed on 02/24/12. Aqs: HxCr analyzed on 02/02/12 @ 12:03
Holding time to analysis met criteria? Soils -168 hours from digestion to analysis. Aqueous – 24 hours from collection to analysis.	x			
Method reference included?	x			3060A/7196A
Laboratory Case Narrative included?	x			
Definitions: MDL – Method Detection Limit; %R – Percent Recovery; RL – Reporting Limit; RPD – Relative Percent Difference; RSD – Relative Standard Deviation :Corr – Correlation Coefficient.				
Comments				
Field Duplicates: No field duplicate samples were submitted with this SDG				
Sample Dilutions: None				

ITEM	YES	NO	N/A	COMMENTS
Initial Calibration Documentation Included in Lab Package?	x			Cal source (aq – WthcrIM2 00030) (soil WThcrIM-00032)
1. Blank plus 4 standards (7196A) or blank plus 3 standards (7199), 2. Correlation coefficient of ≥ 0.995 (7196A) or ≥ 0.999 (7199). 3. Calibrate daily or each time instrument is set up.	x x x			1. Each analysis 1 blank and 5 cal STDs 2. All analyses meet CC 3. Yes
Calibration Check Standard (CCS) for 7196A and Quality Control Sample (QCS) for 7199 Included in Lab Package?	x			Check source (aq – WthcrIM4 00028) (soils WThcrIM3-00016)
1. %R criteria met? (90 - 110%). 2. Correct frequency of once every 10 samples 3. CCS and QCS from independent source and at mid level of calibration curve.	x x x			1. All met %R 2. Analyzed every 10 samples 3. Yes
Calibration Blanks	x			Aqs: 460-101107/1. Soils 460-103553/1
1. Analyzed prior to initial calibration standards and after each CCS/QCS? 2. Absolute value should not exceed MDL.	x x			1. Yes 2. Yes
Method Blank and Field Blanks Included in Lab Package?	x			Equipment Blank FB020112 was ND (2.7 $\mu\text{g/L}$)
1. Method blank analyzed with each preparation batch? 2. Absolute value should not exceed MDL.	x x			1. Yes, aqs – 460-101107/9 (2.7 $\mu\text{g/L}$). Soils –460-103553/1-A (0.75 mg/Kg) 2. Yes, all blanks were less than MDL.
Eh and pH data .	x			
Eh and pH data was included and plotted for all samples?	x			
Soluble Matrix Spike Data Included in Lab Package?	x			460-36375-6 [ICO-23-10.0]
1. %R criteria met? (75-125%R). 2. Was the spike concentration 40 mg/Kg? 3. Was a sample spiked at the frequency of 1/batch or 20 samples?	x x x			1. Yes, batch 103584 = 80 % 2. Yes, 46.2 mg/kg was used. 3. Yes for all batches.
Insoluble Matrix Spike Data Included in Lab Package?	x			460-36375-6 [ICO-23-10.0]
1. %R criteria met? (75-125%R). 2. Was the spike concentration 400 to 800 mg/Kg? 3. Was a sample spiked at the frequency of 1/batch or 20 samples?	x x x			1. Yes, batch 103584 = 96% 2. Yes, 818 mg/kg was used. 3. Yes for all batches.
Post Digestion Spike	x			460-36375-6 [ICO-23-10.0]
1. %R criteria met? (85-115%R). 2. Was the spike concentration 40 mg/Kg or twice the sample concentration? 3. Was a sample spiked at the frequency of 1/batch or 20 samples?	x x x			1. Yes, batch 103584 = 111% 2. Yes, 46.2 mg/kg was used. 3. Yes for all batches.
Sample Duplicate Data Included in Lab Package?	x			460-36375-6 [ICO-23-10.0]
1. RPD criteria met? (RPD < 20%) of both results are $\geq 4x$ RL or control limit of $\pm RL$ if both results are $< 4x$ RL. 2. Was a sample spiked at the frequency of 1/batch or 20 samples?	x x			1. The laboratory duplicate RPD analysis for batch 103584 was not calculated since both the initial and duplicate sample results were reported as nondetect. 2. Yes
Was a Laboratory Control Sample (LCS) Included in Lab Package?	x			
1. %R criteria met? (80-120%R). 2. Was an LCS analyzed at the frequency of 1/batch or 20 samples?	x x			1. Yes, batch 103584 soluble = 101% and insoluble = 99%. Yes, Aqs batch 101107 = 92%. 2. Yes
Miscellaneous Items.				
1. For soils by 3060A, was the initial pH within a range of 7.0-8.0? 2. For soils by 7199, was the pH within a range of 9.0-9.5? 3. For aqueous by 7196A, was the pH with a range of 1.5-2.5? 4. For soils (3060A), was the digestion temperature 90-95°C for at least 60 minutes? 5. For 7199, was each sample injected twice and was the RPD ≤ 20 ?	x x x x		x x	1. Yes 2. NA 3. Yes 4. Yes 5. NA

SDG#: 460-36375
Batch 103584
 Cr+6 ICAL - 02/24/12
 Soils
 (p. 519 of data pkg)

x - concentration	y - response
0	0
50	0.048
100	0.087
500	0.411
750	0.612
1250	1.009

(p. 519 of data pkg)

AECOM Calculated Intercept	-6.950	OK	Reported intercept	-6.950
AECOM Slope	1242	OK	Reported Slope	1242
AECOM Calculated r	1.000	OK	Reported r	1.000

LCS calculation **LCSS 460-103553/2-A pg. 492, 532**

LCS Soluble Instrument Response 0.269
 Instrument Concentration (ug/L) 327.183
 Sample weight 2.5
 Percent solids 1
 Dilution Factor 1

AECOM Calculated LCS Result (mg/Kg)	13.09	OK	Reported Result (mg/Kg)	13.09
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%R = Found/True*100 **pg. 492**

True Value (mg/kg) 13

AECOM Calculated %R	101	OK rounding	Reported %R	101
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MS calculation **[ICO-23-10.0] pgs. 486, 532**

Background reading 0
 MS Insoluble Instrument Response 0.28
 Total absorbance - background 0.28
 Instrument Concentration (ug/L) 340.847
 Sample weight (g) 2.5
 Final Volume (mL) 100
 Percent solids 0.865
 Dilution Factor 50

AECOM Calculated MS Result (mg/Kg)	788.1	OK rounding	Reported Result (mg/Kg)	787.9
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%R = Found/True*100 **pg. 486**

True Value (mg/kg) 818
 Native concentration (g) 0

%R	96	OK	Reported %R	96
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Percent Solids for sample [ICO-23-10.0] pg. 537

Empty dish weight= 2.18
 Wet weight= 7.74
 Dry weight= 6.99

AECOM%solids =	86.5	OK	Reported %solids=	86.5
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Reporting limit calculation [ICO-23-10.0] pgs. 28, 532

Low Standard 50
 Initial weight (g) 2.5
 Final volume (mL) 100
 Percent solids 0.87
 Dilution Factor 1.00

Reporting Limit	2.3	OK	Reported RL (mg/Kg)=	2.3
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Sample Calculations

[ICO-23-10.0]

pgs. 28, 532

Background reading	0.003
Total absorbance	0.01
Total absorbance - background	0.007
Instrument Response (ug/L)	1.745
Sample weight (g)	2.5
Final Volume (mL)	100
Percent solids	0.865
Dilution Factor	1

AECOM Calculated Result (mg/Kg)	0.081	OK sample ND	Reported Result (mg/Kg)	0.87 U
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[ICO-23-2.0]

pgs. 24, 532

Background reading	0.001
Total absorbance	0.053
Total absorbance - background	0.052
Instrument Response (ug/L)	57.641
Sample weight (g)	2.59
Final Volume (mL)	100
Percent solids	0.782
Dilution Factor	1

AECOM Calculated Result (mg/Kg)	2.8	OK	Reported Result (mg/Kg)	2.8
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[ICO-23-0.3]

pg. 23, 532

Background reading	0.004
Total absorbance	0.114
Total absorbance - background	0.11
Instrument Response (ug/L)	129.684
Sample weight (g)	2.48
Final Volume (mL)	100
Percent solids	0.845
Dilution Factor	1

AECOM Calculated Result (mg/Kg)	6.2	OK	Reported Result (mg/Kg)	6.2
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Client Name: PPG Industries	Project Number: 60154801-6001A
Site Location: PPG Forrest St	Project Manager: Robert Cataldo
Laboratory: Test America, Edison, New Jersey	Limited or Full Validation (circle one)
Laboratory Job No: 460-36375	Date Checked: 03/08/2012
Validator: Justin Webster	Peer Review: Lisa Krowitz

ITEM	YES	NO	N/A	COMMENTS
Sample results included?	x			6 soils and 1 equipment blank
Reporting Limits met project requirements?		x		All the soil nondetect silver results for the soils from this SDG exceeded the NJDEP DIGWSSL.
Field I.D. included?	x			
Laboratory I.D. included?	x			
Sample matrix included?	x			
Sample receipt temperature 2-6°C?	x			2.3°C
Signed COCs included?	x			
Date of sample collection included?	x			02/01/12
Date of sample digestion included?	x			Soil: Samples were prepared on 02/02/12. Hg was prepped on 02/03/12. Aqs: FB sample was prepped on 02/03/12. Hg was prepped on 02/06/12.
Date of analysis included?	x			Soil: Samples were analyzed on 02/03/12 and 02/12/12. Hg was analyzed on 02/03/12. Aqs: FB sample was analyzed on 02/03/12. Hg was analyzed on 02/06/12.
Holding time met QC criteria? Metals -180 days from sample collection Mercury – 28 days from sample collection If HT exceeded by - < 10 days, J/UJ all results - > 10 days, R all results	x			All holding times were met.
Method reference included?	x			SW846 3010A/3050B/6020/7470A/7471A
Laboratory Case Narrative included?	x			
Sample Dilutions	x			5x, 20x, 100x, 200x
Field Duplicates (“x” appended to sample ID) (RPD calculation on separate sheet)			x	

Definitions: MDL – Method Detection Limit; %R – Percent Recovery; RL – Reporting Limit; RPD – Relative Percent Difference; RSD – Relative Standard Deviation :Corr – Correlation Coefficient.

Comments

ITEM	YES	NO	N/A	COMMENTS
Initial Calibration Documentation Included in Lab Package?			x	Not reviewed for limited validation
1. Calibrate daily or each time instrument is set up?. If no, reject (R) data. 2. ICP (6010) - Blank plus 1standard? If no, reject (R) data. 3. Hg (7470/7471) – Blank plus 5 standards? If no, reject (R) data.				
Initial Calibration Verification Standard (ICV) for ICP (6010) and Initial Calibration Check Standard (ICCS) for Hg (7470/7471) Included in Lab Package?			x	Not reviewed for limited validation
1. Analyzed immediately after initial calibration? If no, reject (R) data. 2. %R criteria met? (90 - 110%). If no, J positive results for affected analyte(s) if %R between 80-89% and 111-120% and indicate bias UJ non-detect results for affected analyte(s) if R% between 80-89% R all data for affected analyte(s) if <80% or >120% 3. Spot check ICV/ICCS results for several analytes				
Continuing Calibration Verification Standard (CCV) for ICP (6010) and Calibration Check Standard (CCS) for Hg (7470/7471) included in Lab Package?			x	Not reviewed for limited validation
1. Analyzed immediately after each ICV/ICC/CB and after every 10 samples? If no, reject (R) data. 2. CCS and CCV from independent source and at mid level of calibration curve. If no, reject (R) data. 3. %R criteria met? (90 - 110%) If no, J positive results for affected analyte(s) if %R between 80-89% and 111-120% and indicate bias UJ non-detect results for affected analyte(s) if %R between 80-89% R all data for affected analyte(s) if %R <80% or >120% 4. Spot check CCV/CCS results for several analytes				
Low Calibration Standard (CRI) included in Lab Package?			x	Not reviewed for limited validation
1. %R criteria met? - 50 - 150% for Co, Mn, Zn by ICP-MS, PB, TI by 6010) - 70-130% all others If no, refer to ILM05.4 NJ SOP 5.A.2 for actions.				
Calibration Blanks			x	Not reviewed for limited validation
1. Analyzed immediately after daily calibration and after each ICV/ICC/CCV/CCS, and after every 10 samples? If no, reject (R) data. 2. Absolute value $\leq 3xIDL$? If no, - if sample result $\leq 10xCB$ result, qualify affected analyte(s) in associated samples with CB - if sample result $> 10xCB$ result, no qualification				
Method Blank included in Lab Package?	x			
1. Method blank analyzed with each preparation batch or every SDG, or 1/20 samples? If no, reject (R) data, except no aqueous MB required for FB/EB if only soil samples were analyzed. 2. Method blank analyzed 1/20 samples? If - MB 1/25, J sample results from 21-25 - MB > 1/25, R sample results after 25 th sample 3. MB result nondetect? If no, - Sample result $\leq 3xMB$, negate UB - Sample result $<3xMB$, but $\leq 10xMB$, JB - Sample result $> 10xMB$, no qualification 4. Negative MB result reported? If yes, -Positive sample result $\leq 10xMB$, qualify estimated, biased low (J) -Non-detect sample result, qualify UJ, may be false non-detect	x			1. Yes, all frequency criteria were met. 2. Yes 3. Yes 4. No
Field Blanks/Equipment Blanks included in Lab Package?	x			Blanks apply to samples collected during same week as blank
1, FB/EB result nondetect? If no, - Sample result $\leq 3xFB/EB$, negate U - Sample result $<3xFB/EB$, but $\leq 10xFB/EB$, J - Sample result $> 10xFB/EB$, no qualification	x			Equipment Blank FB020112 was nondetect for all analytes.

ITEM	YES	NO	N/A	COMMENTS
ICP Interference Check Sample (ICS) included in Lab Package?			x	Not reviewed for limited validation
1. Analyzed at beginning of analytical run? If no, reject (R) data. 2. %R criteria met? (80-120%) If no, %R > 120%, no qualification if sample result non-detect %R between 121-150%, J positive results, biased high %R between 50-79%, J/UJ results, biased low %R <50% or >150%, reject (R) result 3. Spot check accuracy of %Rs				
Matrix Spike/Matrix Spike Duplicate Data Included in Lab Package?	x			Sample ICO-23-10.0 was used as the source for the soil MS analysis. Batch QC was used for the aqueous preparation batch.
1. MS/MSD %R (75-125%R) and RPD ($\pm 20\%$) criteria met? - %R >125% J positive results for affected analyte(s) for all samples in the same batch/SDG, accept NDs. - %R <75% J/UJ for affected analyte(s) for all samples in the same batch/SDG - RPD outside $\pm 20\%$ J positive results for affected analyte(s) for all samples in the same batch/SDG, accept NDs. 2. Was a sample spiked at the frequency of 1/batch or 20 samples? 3. Was the MS performed on a site sample? 4. Was the MS performed on a FB/EB or TB? If yes, J all sample data.	x x		x	1. Yes, the MS result for aluminum (164%R) was high, however the native sample concentration was greater than 4 times the spike concentration. No data qualifications were required. 2. Yes, all frequency requirements were met. 3. Yes, ICO-23-10.0 4. No
Serial Dilution			x	Not reviewed for limited validation
1. %D ($\leq 10\%$ R) criteria met? - If analyte concentration > 25xIDL (7000) or > 10x IDL (6010) and %D > 10% J positive results for affected analyte(s) for all samples in the same batch/SDG, accept NDs. 2. Was the frequency 1/batch or 20 samples? 3. Was a site sample used? 4. Was a FB/EB or TB used? If yes, J all sample data. 5. Spot check accuracy of %Ds				
Post Digestion Spike			x	Not reviewed for limited validation
1. %R criteria met? (75-125%R). - %R >125% J positive results for affected analyte(s) for all samples in the same batch/SDG, accept NDs. - %R <75% J/UJ affected analyte(s) for all samples in the same batch/SDG. 2. Was the spike performed on a FB/EB or TB? If yes, J all sample data? 3. Was a sample spiked at the frequency of 1/batch or 20 samples?				
Laboratory Control Sample Data Included in Lab Package?	x			
1. LCS %R (80-120%R) criteria met? If no, J/UJ all affected analyte(s) for all samples in the same batch/SDG. data. 2. Was a sample spiked at the frequency of 1/batch or 20 samples? If no, J/UJ affected analyte(s) for all sample in the same batch/SDG.	x	x		1. No, the LCS certified reference material, the aluminum recovery of 71% met the certified recovery limits of 45-154% but exceeded the NJDEP limits of 80-120. All aluminum soil results were qualified biased low. 2. Yes
Laboratory Duplicate Data Included in Lab Package?	x			Sample ICO-23-10.0 was used as the source for the soil MS analysis. Batch QC was used for the aqueous preparation batch.
Aqueous If RPD is >20% but <100% and sample and field duplicate results are >5x the QL, estimate (J) results > the QL. If RPD is >100%, reject (R) results \geq the QL. If sample and/or duplicate is <5x the QL and absolute difference is > the QL, estimate (J) positive results <5x the QL and nondetects (UJ). If absolute difference is > 2x the QL, reject (R) non detects and positive results <5x the QL. SOIL: If RPD is >35% but <120% and sample and field duplicate results are >5x the QL, estimate (J) results > the QL. If RPD is > 120%, reject (R) results > the QL. If sample and/or duplicate is <5x the QL and absolute difference is >2x the QL, estimate (J) positive results <5x QL and nondetects (UJ). If absolute difference is >4x the QL, reject (R) non detects and positive results <5x QL.	x		x	Aqs: A non-site sample was used as the source for the QC analysis. Data qualifications are not applicable for non-site sample. Soil: Sample ICO-23-10.0 RPDs for lead (35%), zinc (131%), and calcium (127%) exceeded the precision criteria of < 35% for sample results greater than 5x the RL. All soil samples from this SDG were qualified for the exceeding RPD analytes.

ITEM	YES	NO	N/A	COMMENTS
Field Duplicate Data Included in Lab Package?		x		
<p><u>Aqueous</u></p> <p>If RPD is >20% but <100% and sample and field duplicate results are >5x the QL, estimate (J) results > the QL. If RPD is >100%, reject (R) results ≥ the QL. If sample and/or duplicate is <5x the QL and absolute difference is > the QL, estimate (J) positive results <5x the QL and nondetects (UJ). If absolute difference is > 2x the QL, reject (R) non detects and positive results <5x the QL.</p> <p><u>SOIL:</u></p> <p>If RPD is >35% but <120% and sample and field duplicate results are >5x the QL, estimate (J) results > the QL. If RPD is > 120%, reject (R) results > the QL. If sample and/or duplicate is <5x the QL and absolute difference is >2x the QL, estimate (J) positive results <5x QL and nondetects (UJ). - If absolute difference is >4x the QL, reject (R) non detects and positive results <5x QL.</p>			<p>x</p> <p>x</p>	<p><u>Aqs:</u> NA</p> <p><u>Soil:</u> NA</p>

Holding Time

Sample ID	Method	Days from Sampling to Prep	Days from Prep to Analysis	Days from Sampling to Analysis	Sampling to Prep Status	Prep to Analysis Status	Sampling to Analysis Status
FB020112 forrest	SW6020	2	0	2			OK @180 days
ICO-23-0.3	SW6020	1	1	2			OK @180 days
ICO-23-0.3	SW6020	1	1	2			OK @180 days
ICO-23-10.0	SW6020	1	1	2			OK @180 days
ICO-23-2.0	SW6020	1	1	2			OK @180 days
ICO-23-2.0	SW6020	1	1	2			OK @180 days
ICO-23-4.0	SW6020	1	1	2			OK @180 days
ICO-23-4.0	SW6020	1	6	7			OK @180 days
ICO-23-6.0	SW6020	1	1	2			OK @180 days
ICO-23-8.0	SW6020	1	1	2			OK @180 days
FB020112 forrest	SW7470	5	0	5			OK @28 days
ICO-23-0.3	SW7471	2	0	2			OK @28 days
ICO-23-10.0	SW7471	2	0	2			OK @28 days
ICO-23-2.0	SW7471	2	0	2			OK @28 days
ICO-23-4.0	SW7471	2	0	2			OK @28 days
ICO-23-6.0	SW7471	2	0	2			OK @28 days
ICO-23-8.0	SW7471	2	0	2			OK @28 days
FB020112 forrest	SW7196			1			OK @1 days
ICO-23-0.3	SW7196	23	0	23	OK @30 days	OK @7 days	OK @37 days
ICO-23-10.0	SW7196	23	0	23	OK @30 days	OK @7 days	OK @37 days
ICO-23-2.0	SW7196	23	0	23	OK @30 days	OK @7 days	OK @37 days
ICO-23-4.0	SW7196	23	0	23	OK @30 days	OK @7 days	OK @37 days
ICO-23-6.0	SW7196	23	0	23	OK @30 days	OK @7 days	OK @37 days
ICO-23-8.0	SW7196	23	0	23	OK @30 days	OK @7 days	OK @37 days

Percent Solids

Sample ID	Percent Solids (%)	Status
ICO-23-0.3	84.5	ok @30%
ICO-23-10.0	86.5	ok @30%
ICO-23-2.0	78.2	ok @30%
ICO-23-4.0	69.8	ok @30%
ICO-23-6.0	80.9	ok @30%
ICO-23-8.0	84.2	ok @30%

Data Validation Report

Project:	PPG Forrest St
Laboratory:	TestAmerica, Edison, NJ
Laboratory Job No.:	460-36482
Analysis/Method:	Hexavalent Chromium SW846 3060A/7196A TAL Metals SW846 3050B/6020/7471A
Validation Level:	Full (Hexavalent Chromium) Limited (TAL Metals)
Site Location/Address:	78 & 90 Forrest St, Jersey City, NJ
AECOM Project Number:	60154801-6001A
Prepared by: Justin Webster/AECOM	Completed on: March 13, 2012
Reviewed by: Lisa Krowitz/AECOM	File Name: 2012-03-13 HxCr_Metal DV Report 460-36482-F.docx

Introduction

The data were reviewed in accordance with the FSP-QAPP and the following NJDEP validation Standard Operating Procedures (SOP):

- NJDEP Office of Data Quality SOP 5.A.10, Rev 3 (September 2009), SOP for Analytical Data Validation of Hexavalent Chromium – for USEPA SW-846 Method 3060A, USEPA SW-846 Method 7196A and USEPA SW-846 Method 7199
- NJDEP Office of Data Quality SOP 5.A.16, Rev 1 (May 2002), Quality Assurance Data Validation of Analytical Deliverables for Inorganics (based on USEPA SW-846 Methods).

The results of quality control data analyzed with site samples were used to assess the overall reliability of the data. The following qualifiers were used to identify data quality issues:

- U: Indicates the analyte was not detected in the sample above the sample reporting limit.
- J: Indicates the result was an estimated value; the associated numerical value was an approximate concentration of the analyte in the sample.
- UJ: Indicates the analyte was not detected above the reporting limit and the reporting limit was approximate.
- R: The sample result was rejected due to serious deficiencies; the presence or absence of the analyte could not be confirmed.

Sample Information

The samples listed below were collected by AECOM on February 2, 2012 as part of the Forrest Street task at 78 & 90 Forrest St, Jersey City, New Jersey.

Field ID	Laboratory ID	Matrix	Fraction
ICO-23-12.0	460-36482-1	Soil	Hexavalent Chromium, TAL Metals
ICO-23-12.0X (Field duplicate for sample ICO-23-12.0)	460-36482-2	Soil	Hexavalent Chromium, TAL Metals

The sample was collected following the procedures detailed in the Draft Work Scope and Budget Estimate for Site Inspection and Investigation Activities for 78 & 90 Forrest Street, Jersey City, New Jersey and the Field Sampling Plan/Quality Assurance Project Plan for Non-Residential and Residential Chromium Sites Hudson County, New Jersey (June 2010).

General Comments

The data package was complete. Quality control (QC) issues identified during validation are discussed below. Refer to the Soil Target Analyte Summary Hit List for a listing of all detected results, qualified results, and associated qualifications, where applicable.

Hexavalent Chromium

MS source sample ICO-23-10.0 from SDG 460-36375, a similar sampling location, was used for data quality recommendations for the samples submitted in this SDG. All the quality control criteria were met for the MS analysis in SDG 460-36375; thus, no data qualifications were required for the samples collected in this SDG.

Total Chromium

Field Duplicate Precision

Sample ICO-23-12.0X was submitted as the field duplicate sample for ICO-23-12.0. The relative percent difference (RPD) for lead (35%) exceeded the acceptable precision criteria of less than 35 percent RPD for sample results greater than five times the reporting limit. The absolute difference for zinc was greater than two times the reporting limit for sample results less than five times the reporting limit. Thus, the lead and zinc results for samples ICO-23-12.0 and ICO-23-12.0X were qualified as estimated (J), with potential for unknown bias, due to poor field duplicate precision.

Reporting Limits

The reporting limits for the nondetect silver results in samples ICO-23-12.0 and ICO-23-12.0X exceeded the Direct Impact to Groundwater standard (DIGWSSL) due to a 20 time dilution factor.

Laboratory Control Sample (LCS) Results

The LCS recovery for aluminum was (77%), which met the certified LCS recovery criteria of 45-154%, but failed the NJDEP LCS recovery criteria of 80-120%R; therefore, all soil sample results for aluminum from this SDG were qualified as estimated (J) with potential for biased low results.

Data Quality and Usability

In general, these data appear to be valid and may be used for decision-making purposes. No data were rejected. Qualified results, if applicable, are discussed in attachments A and B below.

The detect lead and zinc results in all soil samples were estimated with an unknown bias due to poor laboratory precision.

The detect aluminum soil results in all soil samples were estimated, bias low due to low LCS recovery.

Attachments

Attachment A Target Analyte Summary Hitlist(s)

Attachment B Data Validation Report Form

Attachment A

Target Analyte Summary Hitlist(s)

Soil Target Analyte Summary Hit List (TAL Metals)

Site Name 78 & 90 Forrest St, Jersey City, NJ
Sampling Date February 2, 2012
Lab Name/ID TestAmerica, Edison, NJ
SDG No 460-36482
Sample Matrix Soil
Trip Blank ID NA
Field Blank ID FB020112 from SDG 460-36375

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
ICO-23-12.0	460-36482-1	ALUMINUM	U	4520	4520	12.0	Qualify	20
ICO-23-12.0	460-36482-1	ARSENIC	U	2.8	2.8	0.60		
ICO-23-12.0	460-36482-1	BARIUM	U	24.7	24.7	1.2		
ICO-23-12.0	460-36482-1	BERYLLIUM	U	0.45	0.45	0.24		
ICO-23-12.0	460-36482-1	CALCIUM METAL	U	998	998	60.1		
ICO-23-12.0	460-36482-1	CHROMIUM	U	7.8	7.8	1.2		
ICO-23-12.0	460-36482-1	COBALT	U	3.5	3.5	1.2		
ICO-23-12.0	460-36482-1	COPPER	U	8.0	8.0	1.2		
ICO-23-12.0	460-36482-1	IRON	U	8840	8840	36.0		
ICO-23-12.0	460-36482-1	LEAD	U	12.7	12.7	0.36	Qualify	18
ICO-23-12.0	460-36482-1	MAGNESIUM	U	1630	1630	60.1		
ICO-23-12.0	460-36482-1	MANGANESE	U	218	218	2.4		
ICO-23-12.0	460-36482-1	NICKEL	U	6.9	6.9	1.2		
ICO-23-12.0	460-36482-1	POTASSIUM	U	632	632	60.1		
ICO-23-12.0	460-36482-1	SELENIUM	U	1.0	1.0	0.60		
ICO-23-12.0	460-36482-1	SODIUM	U	57.5	57.5	60.1		
ICO-23-12.0	460-36482-1	VANADIUM	U	14.6	14.6	1.2		
ICO-23-12.0	460-36482-1	ZINC	U	32.6	32.6	4.8	Qualify	18
ICO-23-12.0X	460-36482-2	ALUMINUM	U	3400	3400	11.9	Quality	20
ICO-23-12.0X	460-36482-2	ARSENIC	U	2.1	2.1	0.59		

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
ICO-23-12.0X	460-36482-2	BARIUM	U	17.4	17.4	1.2		
ICO-23-12.0X	460-36482-2	BERYLLIUM	U	0.31	0.31	0.24		
ICO-23-12.0X	460-36482-2	CALCIUM METAL	U	815	815	59.4		
ICO-23-12.0X	460-36482-2	CHROMIUM	U	6.2	6.2	1.2		
ICO-23-12.0X	460-36482-2	COBALT	U	2.8	2.8	1.2		
ICO-23-12.0X	460-36482-2	COPPER	U	5.8	5.8	1.2		
ICO-23-12.0X	460-36482-2	IRON	U	6870	6870	35.6		
ICO-23-12.0X	460-36482-2	LEAD	U	7.3	7.3	0.36	Qualify	18
ICO-23-12.0X	460-36482-2	MAGNESIUM	U	1240	1240	59.4		
ICO-23-12.0X	460-36482-2	MANGANESE	U	198	198	2.4		
ICO-23-12.0X	460-36482-2	NICKEL	U	5.5	5.5	1.2		
ICO-23-12.0X	460-36482-2	POTASSIUM	U	469	469	59.4		
ICO-23-12.0X	460-36482-2	SELENIUM	U	0.57	0.57	0.59		
ICO-23-12.0X	460-36482-2	VANADIUM	U	11.0	11.0	1.2		
ICO-23-12.0X	460-36482-2	ZINC	U	22.6	22.6	4.7	Qualify	18

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicate a nondetect result at the RL.

NJDEP Laboratory Footnotes

1. The value reported is less than or equal to 3x the value in the method blank. It is the policy of NJDEP-DPFSR to negate the reported value due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
2. The value reported is greater than three (3) but less than ten (10) times the value in the method blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to the method blank contamination. The "B" qualifier alerts the end-user to the presence of this analyte in the method blank.
3. The value reported is less than or equal to 3x the value in the trip/field blank. It is the policy of NJDEP-DPFSR to negate the reported value as due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
4. The value reported is greater than 3x but less than ten (10) the value in the trip/field blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to trip/field blank contamination.

5. The concentration reported by the laboratory is incorrectly calculated.
6. The laboratory failed to report the presence of the analyte in the sample.
7. The reported metal value was qualified because the Calibration Verification Standard was not within the recovery range (90-110 percent).
8. In the MS/MSD Sample Analysis, this analyte fell outside the control limits of 20% RPD. Therefore, the result was qualified.
9. This analyte was qualified because the laboratory performed the MS/MSD Analysis on a field blank.
10. The reported analyte was qualified because the associated Calibration Blank result was greater than the MDL.
11. The reported value was qualified because serial dilution analysis was not within QC limit of 10% D.
12. This analyte is rejected because the laboratory exceeded the holding time for digestion and analysis.
13. The laboratory subtracted the method blank from the sample result. The reviewer's calculation has added the method blank result to the reported concentration.
14. The photocopy submitted is illegible. Therefore, the QA reviewer cannot read the laboratory's reported concentration result.
15. The reported or nondetected value was qualified because the MS/MSD spike recovery was less than 75 percent.
16. The reported value was qualified because the MS/MSD spike recovery was greater than 125 percent.
17. The non-detected value was qualified (UJ) because the MS/MSD spike recovery was less than 75 percent. The possibility of a false negative exists.
18. The reported values was qualified because the laboratory duplicate exceeded 35 percent RPD or the absolute difference exceeded two times the reporting limit for sample result less than 5 times the reporting limit.
19. The reported value was qualified because the field duplicate exceeded 35 percent RPD.
20. The percent moisture was greater than the QC acceptance criteria of 30%, thus the results were qualified as estimated (J/UJ).
21. The reported or nondetect value was qualified with an uncertain bias because the MS %R and MSD %R had opposing biases.

Attachment B

Data Validation Report Form

Client Name: PPG Industries	Project Number: 60154801-6001A
Site Location: PPG- Forrest St	Project Manager: Robert Cataldo
Laboratory: TestAmerica, Edison, New Jersey	Limited or Full Validation (circle one)
Laboratory Job No: 460-36482	Date Checked: 03/13/2012
Validator: Justin Webster	Peer: Lisa Krowitz

ITEM	YES	NO	N/A	COMMENTS
Sample results included?	x			2 soil samples
Reporting Limits met project requirements?	x			
Field I.D. included?	x			
Laboratory I.D. included?	x			
Sample matrix included?	x			
Sample receipt temperature 2-6°C?	x			4.9°C
Signed COCs included?	x			
Date of sample collection included?	x			02/02/12
Date of sample digestion included?	x			Soil: HxCr prepped on 02/08/12.
Holding time to digestion met criteria? Soils -30 days from collection to digestion.	x			
Date of analysis included?	x			<u>Soil</u> : HxCr analyzed on 02/13/12.
Holding time to analysis met criteria? Soils -168 hours from digestion to analysis. Aqueous – 24 hours from collection to analysis.	x			
Method reference included?	x			3060A/7196A
Laboratory Case Narrative included?	x			
Definitions: MDL – Method Detection Limit; %R – Percent Recovery; RL – Reporting Limit; RPD – Relative Percent Difference; RSD – Relative Standard Deviation :Corr – Correlation Coefficient.				
Comments				
Field Duplicates: Sample ICO-23-12.0 and duplicate sample ICO-23-12.0X were submitted as the field duplicate pair for this SDG. Since both the original and duplicate results were nondetect the RPD could not be calculated.				
Sample Dilutions: None				

ITEM	YES	NO	N/A	COMMENTS
Initial Calibration Documentation Included in Lab Package?	x			Cal source (soil WThcrIM-00032)
1. Blank plus 4 standards (7196A) or blank plus 3 standards (7199), 2. Correlation coefficient of ≥ 0.995 (7196A) or ≥ 0.999 (7199). 3. Calibrate daily or each time instrument is set up.	x x x			1. Each analysis 1 blank and 5 cal STDs 2. All analyses meet CC 3. Yes
Calibration Check Standard (CCS) for 7196A and Quality Control Sample (QCS) for 7199 Included in Lab Package?	x			Check source (soils WThcrIM3-00016)
1. %R criteria met? (90 - 110%). 2. Correct frequency of once every 10 samples 3. CCS and QCS from independent source and at mid level of calibration curve.	x x x			1. All met %R 2. Analyzed every 10 samples 3. Yes
Calibration Blanks	x			Soils 460-102169/1
1. Analyzed prior to initial calibration standards and after each CCS/QCS? 2. Absolute value should not exceed MDL.	x x			1. Yes 2. Yes
Method Blank and Field Blanks Included in Lab Package?	x			Equipment Blank FB020112 from SDG 460-36375 was ND (2.7 $\mu\text{g/L}$)
1. Method blank analyzed with each preparation batch? 2. Absolute value should not exceed MDL.	x x			1. Yes, Soils –460- 101752/1-A (0.75 mg/Kg) 2. Yes.
Eh and pH data .	x			
Eh and pH data was included and plotted for all samples?	x			
Soluble Matrix Spike Data Included in Lab Package?	x			460-36482-6 [ICO-23-10.0] from SDG 460-36375
1. %R criteria met? (75-125%R). 2. Was the spike concentration 40 mg/Kg? 3. Was a sample spiked at the frequency of 1/batch or 20 samples?	x x x			1. Yes, batch 103584 = 80 % 2. Yes, 46.2 mg/kg was used. 3. Yes for all batches.
Insoluble Matrix Spike Data Included in Lab Package?	x			460-36482-6 [ICO-23-10.0] from SDG 460-36375
1. %R criteria met? (75-125%R). 2. Was the spike concentration 400 to 800 mg/Kg? 3. Was a sample spiked at the frequency of 1/batch or 20 samples?	x x x			1. Yes, batch 103584 = 96% 2. Yes, 818 mg/kg was used. 3. Yes for all batches.
Post Digestion Spike	x			460-36482-6 [ICO-23-10.0] from SDG 460-36375
1. %R criteria met? (85-115%R). 2. Was the spike concentration 40 mg/Kg or twice the sample concentration? 3. Was a sample spiked at the frequency of 1/batch or 20 samples?	x x x			1. Yes, batch 103584 = 111% 2. Yes, 46.2 mg/kg was used. 3. Yes for all batches.
Sample Duplicate Data Included in Lab Package?	x			460-36482-6 [ICO-23-10.0] from SDG 460-36375
1. RPD criteria met? (RPD < 20%) of both results are $\geq 4x$ RL or control limit of $\pm RL$ if both results are $< 4x$ RL. 2. Was a sample spiked at the frequency of 1/batch or 20 samples?	x x			1. The laboratory duplicate RPD analysis for batch 103584 was not calculated since both the initial and duplicate sample results were reported as nondetect. 2. Yes
Was a Laboratory Control Sample (LCS) Included in Lab Package?	x			
1. %R criteria met? (80-120%R). 2. Was an LCS analyzed at the frequency of 1/batch or 20 samples?	x x			1. Yes, batch 102169 soluble = 98% and insoluble = 94%. 2. Yes
Miscellaneous Items.				
1. For soils by 3060A, was the initial pH within a range of 7.0-8.0? 2. For soils by 7199, was the pH within a range of 9.0-9.5? 3. For aqueous by 7196A, was the pH with a range of 1.5-2.5? 4. For soils (3060A), was the digestion temperature 90-95°C for at least 60 minutes? 5. For 7199, was each sample injected twice and was the RPD ≤ 20 ?	x x x x		x x	1. Yes 2. NA 3. Yes 4. Yes 5. NA

SDG#: 460-36482
Batch 102169
 Cr+6 ICAL - 02/13/12
 Soils
 (p. 94 of data pkg)

x - concentration	y - response
0	0
50	0.049
100	0.089
500	0.416
750	0.622
1250	1.033

(p. 94 of data pkg)

AECOM Calculated Intercept	-5.751	OK	Reported intercept	-5.751
AECOM Slope	1215	OK	Reported Slope	1215
AECOM Calculated r	1.000	OK	Reported r	1.000

LCSS 460-101752/2-A pgs. 74, 110

LCS calculation

LCS Soluble Instrument Response 0.266
 Instrument Concentration (ug/L) 317.508
 Sample weight 2.5
 Percent solids 1
 Dilution Factor 1

AECOM Calculated LCS Result (mg/Kg)	12.70	OK	Reported Result (mg/Kg)	12.7
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%R = Found/True*100

pg. 74

True Value (mg/kg) 13

AECOM Calculated %R	98	OK	Reported %R	98
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MS calculation

Background reading
 MS Insoluble Instrument Response
 Total absorbance - background
 Instrument Concentration (ug/L)
 Sample weight (g)
 Final Volume (mL)
 Percent solids
 Dilution Factor

See SDG 460-36375 for MS results for a sample from a similar site location.

AECOM Calculated MS Result (mg/Kg)

%R = Found/True*100

True Value (mg/kg)
 Native concentration (g)

%R

Percent Solids for sample [ICO-23-12.0]

pg. 119

Empty dish weight= 2.2
 Wet weight= 8.72
 Dry weight= 7.52

AECOM%solids =	81.6	OK	Reported %solids=	81.6
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Reporting limit calculation [ICO-23-12.0]

pgs. 12, 110

Low Standard 50
 Initial weight (g) 2.44
 Final volume (mL) 100
 Percent solids 0.82
 Dilution Factor 1.00

Reporting Limit	2.5	OK	Reported RL (mg/Kg)=	2.5
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Sample Calculations

[ICO-23-12.0]

pgs. 12, 110

Background reading	0
Total absorbance	0.001
Total absorbance - background	0.001
Instrument Response (ug/L)	-4.535
Sample weight (g)	2.44
Final Volume (mL)	100
Percent solids	0.816
Dilution Factor	1

AECOM Calculated Result (mg/Kg)	-0.228	OK sample ND	Reported Result (mg/Kg)	0.94 U
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[ICO-23-12.0X]

pgs. 13, 110

Background reading	0
Total absorbance	0.001
Total absorbance - background	0.001
Instrument Response (ug/L)	-4.535
Sample weight (g)	2.56
Final Volume (mL)	100
Percent solids	0.787
Dilution Factor	1

AECOM Calculated Result (mg/Kg)	-0.2	OK sample ND	Reported Result (mg/Kg)	0.93 U
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Client Name: PPG Industries	Project Number: 60154801-6001A
Site Location: PPG Forrest St	Project Manager: Robert Cataldo
Laboratory: Test America, Edison, New Jersey	Limited or Full Validation (circle one)
Laboratory Job No: 460-36482	Date Checked: 03/08/2012
Validator: Justin Webster	Peer Review: Lisa Krowitz

ITEM	YES	NO	N/A	COMMENTS
Sample results included?	x			2 soils
Reporting Limits met project requirements?	x			All the nondetect silver results for the soils from this SDG exceeded the NJDEP DIGWSSL.
Field I.D. included?	x			
Laboratory I.D. included?	x			
Sample matrix included?	x			
Sample receipt temperature 2-6°C?	x			4.9°C
Signed COCs included?	x			
Date of sample collection included?	x			02/02/12
Date of sample digestion included?	x			Soil: Samples were prepared on 02/06/12. Hg was prepped on 02/06/12.
Date of analysis included?	x			Soil: Samples were analyzed on 02/07/12 and 02/08/12. Hg was analyzed on 02/06/12.
Holding time met QC criteria? Metals -180 days from sample collection Mercury – 28 days from sample collection If HT exceeded by - ≤ 10 days, J/UJ all results - > 10 days, R all results	x			All holding times were met.
Method reference included?	x			SW846 3050B/6020/7471A
Laboratory Case Narrative included?	x			
Sample Dilutions	x			20x
Field Duplicates (“x “appended to sample ID) (RPD calculation on separate sheet)	x			Samples ICO-23-12.0 and ICO-23-12.0X. See “Field duplicate” table below.

Definitions: MDL – Method Detection Limit; %R – Percent Recovery; RL – Reporting Limit; RPD – Relative Percent Difference; RSD – Relative Standard Deviation :Corr – Correlation Coefficient.

Comments

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ITEM	YES	NO	N/A	COMMENTS
Initial Calibration Documentation Included in Lab Package?			x	Not reviewed for limited validation
1. Calibrate daily or each time instrument is set up?. If no, reject (R) data. 2. ICP (6010) - Blank plus 1 standard? If no, reject (R) data. 3. Hg (7470/7471) – Blank plus 5 standards? If no, reject (R) data.				
Initial Calibration Verification Standard (ICV) for ICP (6010) and Initial Calibration Check Standard (ICCS) for Hg (7470/7471) Included in Lab Package?			x	Not reviewed for limited validation
1. Analyzed immediately after initial calibration? If no, reject (R) data. 2. %R criteria met? (90 - 110%). If no, J positive results for affected analyte(s) if %R between 80-89% and 111-120% and indicate bias UJ non-detect results for affected analyte(s) if R% between 80-89% R all data for affected analyte(s) if <80% or >120% 3. Spot check ICV/ICCS results for several analytes				
Continuing Calibration Verification Standard (CCV) for ICP (6010) and Calibration Check Standard (CCS) for Hg (7470/7471) included in Lab Package?			x	Not reviewed for limited validation
1. Analyzed immediately after each ICV/ICC/CB and after every 10 samples? If no, reject (R) data. 2. CCS and CCV from independent source and at mid level of calibration curve. If no, reject (R) data. 3. %R criteria met? (90 - 110%) If no, J positive results for affected analyte(s) if %R between 80-89% and 111-120% and indicate bias UJ non-detect results for affected analyte(s) if %R between 80-89% R all data for affected analyte(s) if %R <80% or >120% 4. Spot check CCV/CCS results for several analytes				
Low Calibration Standard (CRI) included in Lab Package?			x	Not reviewed for limited validation
1. %R criteria met? - 50 - 150% for Co, Mn, Zn by ICP-MS, PB, TI by 6010) - 70-130% all others If no, refer to ILM05.4 NJ SOP 5.A.2 for actions.				
Calibration Blanks			x	Not reviewed for limited validation
1. Analyzed immediately after daily calibration and after each ICV/ICC/CCV/CCS, and after every 10 samples? If no, reject (R) data. 2. Absolute value $\leq 3xIDL$? If no, - if sample result $\leq 10xCB$ result, qualify affected analyte(s) in associated samples with CB - if sample result $> 10xCB$ result, no qualification				
Method Blank included in Lab Package?	x			
1. Method blank analyzed with each preparation batch or every SDG, or 1/20 samples? If no, reject (R) data, except no aqueous MB required for FB/EB if only soil samples were analyzed. 2. Method blank analyzed 1/20 samples? If - MB 1/25, J sample results from 21-25 - MB > 1/25, R sample results after 25 th sample 3. MB result nondetect? If no, - Sample result $\leq 3xMB$, negate UB - Sample result $<3xMB$, but $\leq 10xMB$, JB - Sample result $> 10xMB$, no qualification 4. Negative MB result reported? If yes, -Positive sample result $\leq 10xMB$, qualify estimated, biased low (J) -Non-detect sample result, qualify UJ, may be false non-detect	x			1. Yes, all frequency criteria were met. 2. Yes 3. Yes 4. No
Field Blanks/Equipment Blanks included in Lab Package?		x		Applicable field blank can be found in SDG 460-36375.
1, FB/EB result nondetect? If no, - Sample result $\leq 3xFB/EB$, negate U - Sample result $<3xFB/EB$, but $\leq 10xFB/EB$, J - Sample result $> 10xFB/EB$, no qualification	x			Equipment Blank FB020112 from SDG 460-36375 was nondetect for all analytes.

ITEM	YES	NO	N/A	COMMENTS
ICP Interference Check Sample (ICS) included in Lab Package?			x	Not reviewed for limited validation
1. Analyzed at beginning of analytical run? If no, reject (R) data. 2. %R criteria met? (80-120%) If no, %R > 120%, no qualification if sample result non-detect %R between 121-150%, J positive results, biased high %R between 50-79%, J/UJ results, biased low %R <50% or >150%, reject (R) result 3. Spot check accuracy of %Rs				
Matrix Spike/Matrix Spike Duplicate Data Included in Lab Package?	x			Batch QC was used as the source for the MS analysis in this SDG.
1. MS/MSD %R (75-125%R) and RPD ($\pm 20\%$) criteria met? - %R >125% J positive results for affected analyte(s) for all samples in the same batch/SDG, accept NDs. - %R <75% J/UJ for affected analyte(s) for all samples in the same batch/SDG - RPD outside $\pm 20\%$ J positive results for affected analyte(s) for all samples in the same batch/SDG, accept NDs. 2. Was a sample spiked at the frequency of 1/batch or 20 samples? 3. Was the MS performed on a site sample? 4. Was the MS performed on a FB/EB or TB? If yes, J all sample data.	x	x	x	1. Since batch QC was used, validation actions are not applicable to the samples collected in this SDG. 2. Yes, all frequency requirements were met. 3. No 4. No
Serial Dilution			x	Not reviewed for limited validation
1. %D ($\leq 10\%$ R) criteria met? - If analyte concentration > 25xIDL (7000) or > 10x IDL (6010) and %D > 10% J positive results for affected analyte(s) for all samples in the same batch/SDG, accept NDs. 2. Was the frequency 1/batch or 20 samples? 3. Was a site sample used? 4. Was a FB/EB or TB used? If yes, J all sample data. 5. Spot check accuracy of %Ds				
Post Digestion Spike			x	Not reviewed for limited validation
1. %R criteria met? (75-125%R). - %R >125% J positive results for affected analyte(s) for all samples in the same batch/SDG, accept NDs. - %R <75% J/UJ affected analyte(s) for all samples in the same batch/SDG. 2. Was the spike performed on a FB/EB or TB? If yes, J all sample data? 3. Was a sample spiked at the frequency of 1/batch or 20 samples?				
Laboratory Control Sample Data Included in Lab Package?	x			
1. LCS %R (80-120%R) criteria met? If no, J/UJ all affected analyte(s) for all samples in the same batch/SDG. data. 2. Was a sample spiked at the frequency of 1/batch or 20 samples? If no, J/UJ affected analyte(s) for all sample in the same batch/SDG.	x	x		1. No, the LCS certified reference material, the aluminum recovery of 77% met the certified recovery limits of 45-154% but exceeded the NJDEP limits of 80-120. All aluminum soil results were qualified biased low. 2. Yes
Laboratory Duplicate Data Included in Lab Package?	x			Batch QC was used as the source for the MS/MSD analysis in this SDG, which was used to demonstrate laboratory precision.
<u>Aqueous</u> If RPD is >20% but <100% and sample and field duplicate results are >5x the QL, estimate (J) results > the QL. If RPD is >100%, reject (R) results \geq the QL. If sample and/or duplicate is <5x the QL and absolute difference is > the QL, estimate (J) positive results <5x the QL and nondetects (UJ). If absolute difference is > 2x the QL, reject (R) non detects and positive results <5x the QL. <u>SOIL:</u> If RPD is >35% but <120% and sample and field duplicate results are >5x the QL, estimate (J) results > the QL. If RPD is > 120%, reject (R) results > the QL. If sample and/or duplicate is <5x the QL and absolute difference is >2x the QL, estimate (J) positive results <5x QL and nondetects (UJ). If absolute difference is >4x the QL, reject (R) non detects and positive results <5x QL.			x	<u>Aqs:</u> NA <u>Soil:</u> Since batch QC was used, validation actions are not applicable to the samples collected in this SDG.

ITEM	YES	NO	N/A	COMMENTS
Field Duplicate Data Included in Lab Package?	x			ICO-23-12.0 and ICO-23-12.0X
<p><u>Aqueous</u> If RPD is >20% but <100% and sample and field duplicate results are >5x the QL, estimate (J) results > the QL. If RPD is >100%, reject (R) results ≥ the QL. If sample and/or duplicate is <5x the QL and absolute difference is > the QL, estimate (J) positive results <5x the QL and nondetects (UU). If absolute difference is > 2x the QL, reject (R) non detects and positive results <5x the QL.</p> <p><u>SOIL:</u> If RPD is >35% but <120% and sample and field duplicate results are >5x the QL, estimate (J) results > the QL. If RPD is > 120%, reject (R) results ≥ the QL. If sample and/or duplicate is <5x the QL and absolute difference is >2x the QL, estimate (J) positive results <5x QL and nondetects (UU). - If absolute difference is >4x the QL, reject (R) non detects and positive results <5x QL.</p>	x		x	<p><u>Aqs:</u> NA</p> <p><u>Soil:</u> See "Field Duplicate" table below for RPD results and qualifiers if applicable.</p>

Holding Time

Sample ID	Method	Days from Sampling to Prep	Days from Prep to Analysis	Days from Sampling to Analysis	Sampling to Prep Status	Prep to Analysis Status	Sampling to Analysis Status
ICO-23-12.0	SW7196	6	5	11	OK @30 days	OK @7 days	OK @37 days
ICO-23-12.0X	SW7196	6	5	11	OK @30 days	OK @7 days	OK @37 days
ICO-23-12.0	SW6020	4	1	5			OK @180 days
ICO-23-12.0X	SW6020	4	1	5			OK @180 days
ICO-23-12.0	SW7471	4	0	4			OK @28 days
ICO-23-12.0X	SW7471	4	0	4			OK @28 days

Percent Solids

Sample ID	Percent Solids (%)	Status
ICO-23-12.0	81.6	ok @30%
ICO-23-12.0X	78.7	ok @30%

Field Duplicate Results For TAL Metals

Analyte	ICO-23-12.0	ICO-23-12.0X	RPD (%)	RPD < 35% for results >5xRL. If sample results < 5xRL, Abs Diff < 2x RL
ALUMINIUM	4520	3400	28.3%	
ANTIMONY	0.46 U	0.45 U	NC	
ARSENIC	2.8	2.1	28.6%	
BARIUM	24.7	17.4	34.7%	
BERYLLIUM	0.45	0.31	36.8%	Abs Diff < 2xRL, OK
CADMIUM	0.50 U	0.50 U	NC	
CALCIUM METAL	998	815	20.2%	
CHROMIUM	7.8	6.2	22.9%	
COBALT	3.5	2.8	22.2%	
COPPER	8.0	5.8	31.9%	
IRON	8840	6870	25.1%	
LEAD	12.7	7.3	54.0%	Qualify (J)
MAGNESIUM	1630	1240	27.2%	
MANGANESE	218	198	9.6%	
NICKEL	6.9	5.5	22.6%	
POTASSIUM	632	469	29.6%	

Analyte	ICO-23-12.0	ICO-23-12.0X	RPD (%)	RPD < 35% for results >5xRL. If sample results < 5xRL, Abs Diff < 2x RL
SELENIUM	1.0	0.57	54.8%	Abs Diff < 2xRL, OK
SILVER	0.99 U	0.97 U	NC	
SODIUM	57.5	44.5 U	NC	Abs Diff < 2xRL, OK
THALLIUM	0.22 U	0.21 U	NC	
VANADIUM	14.6	11.0	28.1%	
ZINC	32.6	22.6	36.2%	Abs Diff > 2xRL, qualify (J)
MERCURY	0.025 U	0.027 U	NC	

Data Validation Report

Project:	PPG – Garfield Avenue Supplemental Remedial Investigation (GARIS) Additional RI Delineation Borings		
Laboratory:	Accutest, Dayton, NJ		
Laboratory Job No.:	JB16184 and JB16184R		
Analysis/Method:	Hexavalent Chromium SW846 3060A/7196A Total Nickel SW846 3050B/3010A/6010C SPLP Nickel 1312/6010C		
Validation Level:	Full (Hexavalent Chromium) Limited (Total Nickel, SPLP Nickel)		
Site Location/Address:	PPG Site 114 – Garfield Avenue, Jersey City, NJ		
AECOM Project Number:	60154801.0004		
Prepared by: Justin Webster/AECOM	Completed on: October 9, 2012		
Reviewed by: Lisa Krowitz/AECOM	File Name: 2012-10-09 DV Report JB15786_R-F.docx		

Introduction

The data were reviewed in accordance with the FSP-QAPP and the following NJDEP and/or Region 2 validation Standard Operating Procedures (SOP):

- NJDEP Office of Data Quality SOP 5.A.10, Rev 3 (September 2009), SOP for Analytical Data Validation of Hexavalent Chromium – for USEPA SW-846 Method 3060A, USEPA SW-846 Method 7196A and USEPA SW-846 Method 7199.
- NJDEP Office of Data Quality SOP 5.A.16, Rev 1 (May 2002), Quality Assurance Data Validation of Analytical Deliverables for Inorganics (based on USEPA SW-846 Methods).

The results of quality control data analyzed with site samples were used to assess the overall reliability of the data. The following qualifiers were used to identify data quality issues:

- U: Indicates the analyte was not detected in the sample above the sample reporting limit.
- J: Indicates the result was an estimated value; the associated numerical value was an approximate concentration of the analyte in the sample.
- UJ: Indicates the analyte was not detected above the reporting limit and the reporting limit was approximate.
- R: The sample result was rejected due to serious deficiencies; the presence or absence of the analyte could not be confirmed.

Sample Information

The samples listed below were collected by AECOM on September 12, 2012 as part of the Garfield Avenue Supplemental Remedial Investigation (GARIS) Additional RI Delineation Borings (EF) sampling at the PPG Site - 114 Jersey City, New Jersey.

Field ID	Laboratory ID	Matrix	Fraction
EF-EB20120912 (Equipment Blank)	JB16184-1	Soil	Hexavalent Chromium, Total Nickel
EF-B112-1.0-1.5	JB16184-2, -2R	Soil	Hexavalent Chromium
EF-B107-4.0-4.5	JB16184-3, -3R	Soil	Hexavalent Chromium
EF-B107-2.0-2.5	JB16184-4, -4R	Soil	Hexavalent Chromium
EF-B107-0.5-1.0	JB16184-5, -5R	Soil	Hexavalent Chromium, Total Nickel, SPLP Nickel

The samples were collected following the procedures detailed in the Remedial Investigation Work Plan – Soil for Non-Residential Chromate Chemical Production Waste Sites 114, 132, 133, 135, 137, 143, and 186, Jersey City, New Jersey and the Field Sampling Plan/Quality Assurance Project Plan for Non-Residential and Residential Chromium Sites Hudson County, New Jersey (December 2011).

General Comments

The data package was complete. Quality control (QC) issues identified during validation are discussed below. Refer to the Soil Target Analyte Summary Hit List for a listing of all detected results, qualified results, and associated qualifications, where applicable.

Hexavalent Chromium

Matrix Spike Results

Sample EF-B107-2.0-2.5 (JB16184-4) was selected for the soil matrix spike analysis and used for supporting data quality recommendations. The soluble and insoluble matrix spike (MS) recoveries from the initial batch (GN72731) were 12.9% and 73.2%, respectively; the soluble and insoluble MS recoveries did not meet quality control criteria of 75-125%R. The post digestion spike (PDS) recovery was 78.6% and the pH-adjusted PDS recovery was 73.5%, which did not meet the PDS criteria of 85-115%.

Based on poor MS recoveries of less than 75%R, the samples were reanalyzed using Method 7196. The soluble and insoluble matrix spike recoveries from the re-analysis (batch GN72929) were 5.1% and 86.1%, respectively; the soluble MS recovery did not meet the quality control criteria of 75-125%R. The post spike result for the re-analysis batch was recovered at 79.5% and the pH-adjusted PDS recovery was 83.8%, again not meeting the PDS criteria of 85-115%.

Due to low MS recoveries, additional parameters were analyzed to determine if possible matrix interferences could be the cause for the poor matrix spike recoveries. The sample was tested for pH and oxidation reduction potential (ORP) and plotted on an Eh/pH phase diagram chart. From this chart, the source sample for the matrix spike analysis was plotted below the phase change line, indicating reducing potential within the sample matrix, incapable of supporting hexavalent chromium. Analyses for ferrous iron, sulfide screen, and total organic carbon (TOC) were performed on the MS source sample to confirm the reducing potential within the sample matrix. The sulfide screen was reported as nondetect, indicating no reducing agents within the sample matrix; however, the ferrous iron result (1.1%) and the TOC result (19,500 mg/Kg) were positive, indicating potential reducing agents within the sample matrix.

The soil hexavalent chromium results were reported from the re-analysis since the insoluble MS recovery showed improvement from the initial analysis. However, the highest result for hexavalent chromium was reported for each sample so some results were reported from the initial analysis. Since the soluble MS recoveries from the initial and reanalysis were below 75%R, the reported hexavalent chromium results for all soil samples in this SDG were qualified as estimated (J).

Total and SPLP Nickel

There were no nonconformances noted by the laboratory and no nonconformances were discovered during the validation. All total and SPLP nickel data were acceptable as reported by the laboratory.

Data Quality and Usability

In general, these data appear to be valid and may be used for decision-making purposes. No data were rejected. Qualified results, if applicable, are discussed in attachments A and B below.

The reported hexavalent chromium results in all soil samples are usable as estimated values with the potential for bias low due to poor MS recoveries.

Attachments

Attachment A Target Analyte Summary Hitlist(s)

Attachment B Data Validation Report Form

Attachment A

Target Analyte Summary Hitlist(s)

Soil Target Analyte Summary Hit List (Hexavalent Chromium)

Site Name PPG –GARIS Additional RI Delineation Borings at PPG Site 114, Jersey City, NJ
Sampling Date September 07, 2012
Lab Name/ID Accutest Laboratories, Dayton, NJ
SDG No JB16184 and JB16184R
Sample Matrix Soil
Trip Blank ID NA
Field Blank ID EF-EB20120912

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
EF-B107-2.0-2.5	JB16184-4	CHROMIUM (HEXAVALENT)	U	0.79	0.79	0.50	Qualify	27
EF-B112-1.0-1.5	JB16184-2	CHROMIUM (HEXAVALENT)	U	66.8	66.8	0.98	Qualify	27
EF-B107-4.0-4.5	JB16184-3R	CHROMIUM (HEXAVALENT)	U	0.54	0.54	0.49	Qualify	27

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

NJDEP Laboratory Footnote

1. The value reported is less than or equal to 3x the value in the preparation/reagent blank. It is the policy of NJDEP-DPFSR to negate the reported value due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
2. The value reported is greater than three (3) times but less than ten (10) times the value in the preparation/reagent blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to the preparation/reagent blank contamination. The "B" qualifier alerts the end-user to the presence of this analyte in the preparation/reagent blank.
3. The value reported is less than or equal to three (3) times the value in the trip/field blank. It is the policy of NJDEP-DPFSR to negate the reported value as due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
4. The value reported is greater than three (3) times but less than ten (10) times the value in the trip/field blanks and is considered "real". However, the reported value must be quantitatively qualified "J" due to trip/field blank contamination.

5. The concentration reported by the laboratory is incorrectly calculated.
6. The laboratory failed to report the presence of the analyte in the sample.
7. The reported Hexavalent Chromium value was qualified because the Calibration Check Standard was not within the recovery range (90-110 percent).
8. In the Duplicate Sample Analysis, Hexavalent Chromium fell outside the control limits of ± 20 percent for sample results $> 4xRL$ or $\pm RL$ for sample results $< 4xRL$. Therefore, the result was qualified.
9. This analyte was rejected because the laboratory performed the Duplicate Analysis on a field blank.
10. The reported value was qualified because the PVS recovery was greater than 115 percent.
11. The reported value was qualified because the PVS recovery was less than 85 percent.
12. The non-detected value was qualified (UJ) because the PVS recovery was less than 85 percent. The possibility of a false negative exists.
13. The reported analyte was qualified because the associated Calibration Blank result was greater than the MDL.
14. The laboratory made a transcription error. No hits were found in the raw data.
15. This analyte is rejected because the laboratory exceeded the holding time for digestion and analysis.
16. The laboratory subtracted the preparation/reagent blank from the sample result. The Reviewer's calculation puts the preparation/reagent blank back into the result.
17. The photocopy is unreadable. Therefore, the QA reviewer cannot read the laboratory's reported concentration result.
18. The reported value was qualified because the predigestion spike recovery was less than 75 %, but greater than 50%.
19. The reported value was qualified because the predigestion spike recovery was greater than 125 percent.
20. The non-detected value was qualified (UJ) because the redigestion spike recovery was less than 75 percent. The possibility of a false negative exists.
21. The reported result was qualified or rejected because the laboratory did not record the pH value(s) of the sample in a laboratory notebook.
22. The reported value was qualified (J/UJ) because the sample moisture content exceeded 50 percent.

23. The sample result was rejected because the soluble and insoluble matrix spike recoveries were less than 50%.
24. The detected sample result was qualified (J) because the incorrect spike concentration was used.
25. The reported sample results were rejected because the predigestion spike recovery was greater than 150 percent.
26. The reported sample results were rejected because the redigestion spike recovery was greater than 150 percent.
27. The reported value was qualified (J) because the redigestion spike recovery was less than 75 percent.
28. The reported value was qualified (J/UJ) because the sample digestion temperature was less than 90°C.
29. In the Field Duplicate Sample Analysis, Hexavalent Chromium fell outside the control limits of $\leq 20\%$ for sample results $> 4xRL$ or $\pm RL$ for sample results $< 4xRL$. Therefore, the result was qualified.
30. The reported value was qualified as estimated (J/UJ) but the bias is uncertain due to both high and low MS recoveries.
31. The reported result was greater than the MDL but less than the RL and qualified (J) as estimated by the laboratory.
32. The reported value was qualified because the sample replicate precision criterion of $\leq 20\%$ for method 7199 was exceeded.
33. The reported value was qualified (J/UJ) because the laboratory control sample (LCS) recovery was less than 80%.
34. The reported value was qualified (J) because the laboratory control sample (LCS) recovery was greater than 120%.
35. The reported result was qualified because the matrix spike analysis was not performed at the proper frequency.
36. The reported result was qualified because the laboratory duplicate analysis was not performed at the proper frequency.
37. The result was qualified because the cooler temperature upon sample receipt exceeded 6°C.
38. The reported value was qualified because the redigestion spike recovery was greater than 125 percent.
39. The reported result was rejected because the laboratory failed to perform the reanalysis due to insufficient sample volume.
40. The reported results was qualified because the laboratory failed to analyze an ending CCB.

Soil Target Analyte Summary Hit List (Total Nickel)

Site Name PPG –GARIS Additional RI Delineation Borings at PPG Site 114, Jersey City, NJ
Sampling Date September 7, 2012
Lab Name/ID Accutest Laboratories, Dayton, NJ
SDG No JB16184
Sample Matrix Soil
Trip Blank ID NA
Field Blank ID EF-EB20120912

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
EF-B107-0.5-1.0	JB16184-5	NICKEL	U	25.2	25.2	4.4		

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

NJDEP Laboratory Footnotes

1. The value reported is less than or equal to 3x the value in the method blank. It is the policy of NJDEP-DPF SR to negate the reported value due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
2. The value reported is greater than three (3) but less than ten (10) times the value in the method blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to the method blank contamination. The "B" qualifier alerts the end-user to the presence of this analyte in the method blank.
3. The value reported is less than or equal to 3x the value in the trip/field blank. It is the policy of NJDEP-DPF SR to negate the reported value as due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
4. The value reported is greater than 3x but less than ten (10) the value in the trip/field blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to trip/field blank contamination.
5. The concentration reported by the laboratory is incorrectly calculated.
6. The laboratory failed to report the presence of the analyte in the sample.

7. The reported metal value was qualified because the Calibration Verification Standard was not within the recovery range (90-110 percent).
8. In the MS/MSD Sample Analysis, this analyte fell outside the control limits of 20% RPD. Therefore, the result was qualified.
9. This analyte was qualified because the laboratory performed the MS/MSD Analysis on a field blank.
10. The reported analyte was qualified because the associated Calibration Blank result was greater than the MDL.
11. The reported value was qualified because serial dilution analysis was not within QC limit of 10% D.
12. This analyte is rejected because the laboratory exceeded the holding time for digestion and analysis.
13. The laboratory subtracted the method blank from the sample result. The reviewer's calculation has added the method blank result to the reported concentration.
14. The photocopy submitted is illegible. Therefore, the QA reviewer cannot read the laboratory's reported concentration result.
15. The reported or nondetected value was qualified because the MS/MSD spike recovery was less than 75 percent.
16. The reported value was qualified because the MS/MSD spike recovery was greater than 125 percent.
17. The non-detected value was qualified (UJ) because the MS/MSD spike recovery was less than 75 percent. The possibility of a false negative exists.
18. The reported values was qualified because the laboratory duplicate exceeded 35 percent RPD or the absolute difference exceeded two times the reporting limit for sample result less than 5 times the reporting limit.
19. The reported value was qualified because the field duplicate exceeded 35 percent RPD.
20. The reported value was qualified because the LCS recovery was less than 80 percent.
21. The reported value was qualified because the sample moisture content was greater than 50 percent.
22. The reported value was rejected because the field duplicate absolute difference was greater than 4 times the RL or the RPD was greater than 120%.
23. The reported result was greater than the MDL but less than the RL and qualified (J) as estimated by the laboratory.

24. The reported value was qualified because the field duplicate exceeded 20 percent RPD or the absolute difference exceeded two times the reporting limit for sample result less than 5 times the reporting limit.
25. The reported value was qualified because the LCS recovery was greater than 120 percent

Attachment B

Data Validation Report Form

Client Name: PPG Industries	Project Number: 60154801.0004
Site Location: PPG- GARIS Additional RI Delineation	Project Manager: Robert Cataldo
Laboratory: Accutest, Dayton, New Jersey	Limited or Full Validation (circle one)
Laboratory Job No: JB16184 and JB16184R	Date Checked: 10/04/2012
Validator: Justin Webster	Peer: Lisa Krowitz

ITEM	YES	NO	N/A	COMMENTS
Sample results included?	x			4 soils and 1 EB
Reporting Limits met project requirements?	x			
Field I.D. included?	x			
Laboratory I.D. included?	x			
Sample matrix included?	x			
Sample receipt temperature 2-6°C?	x			4.0°C
Signed COCs included?	x			
Date of sample collection included?	x			09/07/2012
Date of sample digestion included?	x			<u>Soil:</u> JB16184 HxCr prepped on 09/24/2012 <u>Soil:</u> JB16184R HxCr prepped on 09/28/2012
Holding time to digestion met criteria? Soils -30 days from collection to digestion.	x			Yes
Date of analysis included?	x			<u>Soil:</u> JB16184: HxCr analyzed on 09/26/2012. <u>Soil:</u> JB16184R: HxCr analyzed on 09/29/2012. <u>AQ:</u> 09/13/2012 @ 13:57
Holding time to analysis met criteria? Soils -168 hours from digestion to analysis. Aqueous – 24 hours from collection to analysis.	x			Yes
Method reference included?	x			3060A/7196A
Laboratory Case Narrative included?	x			

Definitions: MDL – Method Detection Limit; %R – Percent Recovery; RL – Reporting Limit; RPD – Relative Percent Difference; RSD – Relative Standard Deviation ;Corr – Correlation Coefficient.

Comments

Field Duplicates: None for this SDG.

Percent Solids: All ok

Sample Dilutions: None for this SDG

ITEM	YES	NO	N/A	COMMENTS
Initial Calibration Documentation Included in Lab Package?	x			Cal source (AQ: Absolute Lot #031912); (SO: Absolute lot #072512 for initial and reanalysis)
1. Blank plus 4 standards (7196A) or blank plus 3 standards (7199), 2. Correlation coefficient of ≥ 0.995 (7196A) or ≥ 0.999 (7199). 3. Calibrate daily or each time instrument is set up.	x x x			1. Each analysis 1 blank and 7 cal STDs 2. All analyses meet CC 3. Yes
Calibration Check Standard (CCS) for 7196A and Quality Control Sample (QCS) for 7199 Included in Lab Package?	x			Check source (SO and AQ – Ultra lot # L00439)
1. %R criteria met? (90 - 110%). 2. Correct frequency of once every 10 samples 3. CCS and QCS from independent source and at mid level of calibration curve.	x x x			1. All met %R 2. Analyzed every 10 samples 3. Yes
Calibration Blanks	x			
1. Analyzed prior to initial calibration standards and after each CCS/QCS? 2. Absolute value should not exceed MDL.	x x			1. Yes 2. Yes
Method Blank and Field Blanks Included in Lab Package?	x			Equipment Blank EF-EB20120912
1. Method blank analyzed with each preparation batch? 2. Absolute value should not exceed MDL.	x x			1. Yes, AQ GN71209; Soil: JB16184 GP67291-MB1 and JB16184R GP67412-MB1 2. Yes, all method and field blanks were less than MDL.
Eh and pH data.	x			
Eh and pH data was included and plotted for all samples?	x			
Soluble Matrix Spike Data Included in Lab Package?	x			JB16184-4 [EF-B107-2.0-2.5]; JB16184-4R [EF-B107-2.0-2.5]
1. %R criteria met? (75-125%R). 2. Was the spike concentration 40 mg/Kg or twice the sample concentration, whichever is greater? 3. Was a sample spiked at the frequency of 1/batch or 20 samples?	 x x	x x		1. a. JB16184 – No (12.9 %) b. JB16184R – No (5.1%) 2. a. JB16184 Yes, 40.65 mg/kg. b. JB16184R Yes, 37.57 mg/kg. 2. Yes for all batches.
Insoluble Matrix Spike Data Included in Lab Package?	x			JB16184-4 [EF-B107-2.0-2.5]; JB16184-4R [EF-B107-2.0-2.5]
1. %R criteria met? (75-125%R). 2. Was the spike concentration around 400 to 800 mg/Kg? 3. Was a sample spiked at the frequency of 1/batch or 20 samples?	x x	x x		1. a. JB16184: No (73.2%) b. JB16184R Yes, (86.1%) 2. a. JB16184 No, (901.49 mg/kg). No impact to data. b. JB16184R No, (895.28 mg/kg). No impact to data. 3. Yes for all batches.
Post Digestion Spike	x			JB16184-4 [EF-B107-2.0-2.5]; JB16184-4R [EF-B107-2.0-2.5]
1. %R criteria met? (85-115%R). 2. Was the spike concentration 40 mg/Kg or twice the sample concentration? 3. Was a sample spiked at the frequency of 1/batch or 20 samples?	 x x	x x		1. a. JB16184 No (78.6%); pH-adjusted PDS (73.5%R) b. JB16184R No (79.5%R), pH-adjusted PDS (83.8%R) 2. a. JB16184 Yes, 40.40 mg/kg and 40.25mg/Kg b. JB16184R Yes 40.26 mg/kg and 40.4 mg/Kg 3. Yes for all batches.
Sample Duplicate Data Included in Lab Package?	x			JB16184-4 [EF-B107-2.0-2.5]; JB16184-4R [EF-B107-2.0-2.5]
1. RPD criteria met? (RPD < 20%) of both results are $\geq 4x$ RL or control limit of $\pm RL$ if both results are $< 4x$ RL. 2. Was a sample spiked at the frequency of 1/batch or 20 samples?	 x	x x		1. a. JB16184 – Yes , the absolute difference was $\pm RL$ for sample results $< 4xRL$. b. JB16184R – Yes, the absolute difference was $\pm RL$ for sample results $< 4xRL$. 2. Yes for all batches
Was a Laboratory Control Sample (LCS) Included in Lab Package?	x			
1. %R criteria met? (80-120%R). 2. Was an LCS analyzed at the frequency of 1/batch or 20 samples?	x x			1. Yes, all LCS recoveries were within quality control criteria. 2. Yes
Miscellaneous Items.				
1. For soils by 3060A, was the initial pH within a range of 7.0-8.0? 2. For soils by 7199, was the pH within a range of 9.0-9.5? 3. For aqueous by 7196A, was the pH with a range of 1.5-2.5? 4. For soils (3060A), was the digestion temperature 90-95°C for at least 60 minutes? 5. For 7199, was each sample injected twice and was the RPD ≤ 20 ?	x x x		x x	1. Yes 2. NA 3. Yes 4. Yes 5. NA

SDG#: JB16184
Batch: GN72929
 Cr+6 ICAL 09/28/2012
 Soil
 (p. 27 of data pkg)

x - concentration	y - response
0	0
0.01	0.009
0.05	0.045
0.1	0.089
0.3	0.271
0.5	0.448
0.8	0.7
1	0.899

(p. 27 of data pkg)

AECOM Calculated Intercept	0.0004	OK	Reported intercept	0.0004
AECOM Slope	0.8905	OK	Reported Slope	0.8905
AECOM Calculated r	0.99985	OK	Reported r	0.99985

LCS calculation GP67516-B1 pgs. 27

Background Absorbance	0			
Total absorbance	0.895			
Total absorbance - background	0.895			
Instrument Concentration (mg/L)	1.005			
Sample weight (kg)	0.0025			
Final Volume (L)	0.1			
Dilution Factor	1			
AECOM Calculated LCS Result (mg/Kg)	40.2	OK	Reported Result (mg/Kg)	40.2

%R = Found/True*100 GP67516-B1 pg. 18

True Value (mg/kg)	40			
AECOM Calculated %R	100.5	OK	Reported %R	100.5

MS calculation GP67516-S2 EF-B107-2.0-2.5 pg. 27

Background reading	0.008			
Total absorbance	0.349			
Total absorbance - background	0.341			
Instrument Concentration (mg/L)	0.3825			
Sample weight (kg)	0.00248			
Final Volume (L)	0.1			
Percent solids	0.804			
Dilution Factor	50			
AECOM Calculated MS Result (mg/Kg)	959	OK rounding	Reported Result (mg/Kg)	959

%R = Found/True*100 EF-B107-2.0-2.5 pg. 22

True Value (mg/kg)	1110			
Native concentration (mg/Kg)	0			
AECOM %R	86.4	OK rounding	Reported %R	86.1

Percent Solids EF-B107-2.0-2.5 pg. 25

Empty dish weight (g)=	21.71			
Wet weight (g)=	31.29			
Dry weight (g)=	29.41			
AECOM %solids =	80.4	OK	reported %solids=	80.4

Reporting Limit EF-B107-2.0-2.5 pg. 10, 27

Low Standard	0.01			
Initial weight (kg)	0.00251			
Final volume (L)	0.1			
Percent solids	0.804			
Dilution Factor	1			
Reporting Limit	0.5	OK	Reported RL (mg/Kg)=	0.5

Sample Calculations**EF-B107-2.0-2.5****pg. 10, 27**

Background reading	0.174			
Total absorbance	0.174			
Total absorbance - background	0			
Instrument Response (mg/L)	0.000			
Sample weight (kg)	0.00251			
Final Volume (L)	0.1			
Percent solids	0.804			
Dilution Factor	1			
AECOM Calculated Result (mg/Kg)	-0.02	OK sample ND	Reported Result (mg/Kg)	0.15 U

Holding Times

Sample ID	Method	Days from Sampling to Prep	Days from Prep to Analysis	Days from Sampling to Analysis	Sampling to Prep Status	Prep to Analysis Status	Sampling to Analysis Status
EF-EB20120912	SW7196			1			OK @1 days
EF-B107-2.0-2.5	SW7196	12	2	14	OK @30 days	OK @7 days	OK @37 days
EF-B107-2.0-2.5	SW7196	16	1	17	OK @30 days	OK @7 days	OK @37 days
EF-B107-4.0-4.5	SW7196	12	2	14	OK @30 days	OK @7 days	OK @37 days
EF-B107-4.0-4.5	SW7196	16	1	17	OK @30 days	OK @7 days	OK @37 days
EF-B112-1.0-1.5	SW7196	12	2	14	OK @30 days	OK @7 days	OK @37 days
EF-B112-1.0-1.5	SW7196	16	1	17	OK @30 days	OK @7 days	OK @37 days

Percent Solids

Sample ID	Percent Solids (%)	Status
EF-B107-2.0-2.5	80.4	ok @50%
EF-B107-4.0-4.5	81.2	ok @50%
EF-B112-1.0-1.5	81.4	ok @50%

Matrix Spikes

Sample ID	Compound	Analysis batch	MSS % Recovery	MSI % Recovery	PDS %R	Adj pH PDS %R	Lower Limit	Upper Limit
EF-B101-17.7-18.2	CHROMIUM (HEXAVALENT)	GN72731	12.9	73.2	78.6	73.5	75	125
EF-B101-17.7-18.2	CHROMIUM (HEXAVALENT)	GN72929	5.1	86.1	79.5	83.8	75	125

Client Name: PPG Industries	Project Number: 60154801.0004
Site Location: PPG- GARIS Additional RI Delineation Borings	Project Manager: Robert Cataldo
Laboratory: Accutest Laboratories, New Jersey	<input type="checkbox"/> Limited or Full Validation (circle one)
Laboratory Job No: JB16184	Date Checked: 10/04/2012
Validator: Justin Webster	Peer: Lisa Krowitz

ITEM	YES	NO	N/A	COMMENTS
Sample results included?	X			1 soil, 1 equipment blank
Reporting Limits met project requirements?	X			
Field I.D. included?	X			
Laboratory I.D. included?	X			
Sample matrix included?	X			
Sample receipt temperature 2-6°C?	X			2.0°C
Signed COCs included?	X			
Date of sample collection included?	X			09/12/12
Date of sample digestion included?	X			Soil: 09/21/12 AQ: 09/11/12 Leachate: 09/21/12
Date of analysis included?	X			Soil: 9/22/12 Leachate: 09/26/12 AQ: 09/23/12
Holding time met QC criteria? Metals -180 days from sample collection Mercury – 28 days from sample collection If HT exceeded by - ≤ 10 days, J/UJ all results - > 10 days, R all results	X			All holding times were met.
Method reference included?	X			SW846 3050B/3010A/1312/6010C
Laboratory Case Narrative included?	X			
Sample Dilutions		X		
Field Duplicates ("x" appended to sample ID) (RPD calculation on separate sheet)		X		none in this SDG
Definitions: MDL – Method Detection Limit; %R – Percent Recovery; RL – Reporting Limit; RPD – Relative Percent Difference; RSD – Relative Standard Deviation :Corr – Correlation Coefficient.				
Comments				
<u>%Solids:</u> all >50%; no qualifications				
<u>Dilutions:</u> none				

ITEM	YES	NO	N/A	COMMENTS
Initial Calibration Documentation Included in Lab Package?			x	Not reviewed for limited validation
1. Calibrate daily or each time instrument is set up?. If no, reject (R) data. 2. ICP (6010) - Blank plus 1standard? If no, reject (R) data. 3. Hg (7470/7471) – Blank plus 5 standards? If no, reject (R) data.				
Initial Calibration Verification Standard (ICV) for ICP (6010) and Initial Calibration Check Standard (ICCS) for Hg (7470/7471) Included in Lab Package?			x	Not reviewed for limited validation
1. Analyzed immediately after initial calibration? If no, reject (R) data. 2. %R criteria met? (90 - 110%). If no, J positive results for affected analyte(s) if %R between 80-89% and 111-120% and indicate bias UJ non-detect results for affected analyte(s) if %R between 80-89% R all data for affected analyte(s) if <80% or >120% 3. Spot check ICV/ICCS results for several analytes				
Continuing Calibration Verification Standard (CCV) for ICP (6010) and Calibration Check Standard (CCS) for Hg (7470/7471) included in Lab Package?			x	Not reviewed for limited validation
1. Analyzed immediately after each ICV/ICC/CB and after every 10 samples? If no, reject (R) data. 2. CCS and CCV from independent source and at mid level of calibration curve. If no, reject (R) data. 3. %R criteria met? (90 - 110%) If no, J positive results for affected analyte(s) if %R between 80-89% and 111-120% and indicate bias UJ non-detect results for affected analyte(s) if %R between 80-89% R all data for affected analyte(s) if %R <80% or >120% 4. Spot check CCV/CCS results for several analytes				
Low Calibration Standard (CRI) included in Lab Package?			x	Not reviewed for limited validation
1. %R criteria met? - 50 - 150% for Co, Mn, Zn by ICP-MS, PB, TI by 6010) - 70-130% all others If no, refer to ILM05.4 NJ SOP 5.A.2 for actions.				
Calibration Blanks			x	Not reviewed for limited validation
1. Analyzed immediately after daily calibration and after each ICV/ICC/CCV/CCS, and after every 10 samples? If no, reject (R) data. 2. Absolute value $\leq 3xIDL$? If no, - if sample result $\leq 10xCB$ result, qualify affected analyte(s) in associated samples with CB - if sample result $> 10xCB$ result, no qualification				
Method Blank included in Lab Package?	x			
1. Method blank analyzed with each preparation batch or every SDG, or 1/20 samples? If no, reject (R) data, except no aqueous MB required for FB/EB if only soil samples were analyzed. 2. Method blank analyzed 1/20 samples? If - MB 1/25, J sample results from 21-25 - MB > 1/25, R sample results after 25 th sample 3. MB result nondetect? If no, - Sample result $\leq 3xMB$, negate UB - Sample result $<3xMB$, but $\leq 10xMB$, JB - Sample result $> 10xMB$, no qualification 4. Negative MB result reported? If yes, -Positive sample result $\leq 10xMB$, qualify estimated, biased low (J) -Non-detect sample result, qualify UJ, may be false non-detect	x		x	1. Yes, all frequency criteria were met. 2. Yes 3. Yes, all MBs reported as nondetect. 4. No
Field Blanks/Equipment Blanks included in Lab Package?	x			EF-EB20120912
1. FB/EB result nondetect? If no, - Sample result $\leq 3xFB/EB$, negate U - Sample result $>3xFB/EB$, but $\leq 10xFB/EB$, J - Sample result $> 10xFB/EB$, no qualification	x			EF-EB20120907 analyzed for total Nickel and was ND

ITEM	YES	NO	N/A	COMMENTS
ICP Interference Check Sample (ICS) included in Lab Package?			x	Not reviewed for limited validation
1. Analyzed at beginning of analytical run? If no, reject (R) data. 2. %R criteria met? (80-120%) If no, %R > 120%, no qualification if sample result non-detect %R between 121-150%, J positive results, biased high %R between 50-79%, J/UJ results, biased low %R <50% or >150%, reject (R) result 3. Spot check accuracy of %Rs				
Matrix Spike/Matrix Spike Duplicate Data Included in Lab Package?	x			<u>Soil</u> : not from this site; not assessed <u>Leachate</u> : not from this site; not assessed
1. MS/MSD %R (75-125%R) and RPD ($\pm 20\%$) criteria met? - %R >125% J positive results for affected analyte(s) for all samples in the same batch/SDG, accept NDs. - %R <75% J/UJ for affected analyte(s) for all samples in the same batch/SDG - RPD outside $\pm 20\%$ J positive results for affected analyte(s) for all samples in the same batch/SDG, accept NDs. 2. Was a sample spiked at the frequency of 1/batch or 20 samples? 3. Was the MS performed on a site sample? 4. Was the MS performed on a FB/EB or TB? If yes, J all sample data.			x	1.NA; not assessed 2. NA; not assessed 3. No 4. No
Serial Dilution			x	Not reviewed for limited validation
1. %D ($\leq 10\%$ R) criteria met? - If analyte concentration > 25xIDL (7000) or > 10x IDL (6010) and %D > 10% J positive results for affected analyte(s) for all samples in the same batch/SDG, accept NDs. 2. Was the frequency 1/batch or 20 samples? 3. Was a site sample used? 4. Was a FB/EB or TB used? If yes, J all sample data. 5. Spot check accuracy of %Ds				
Post Digestion Spike			x	Not reviewed for limited validation
1. %R criteria met? (75-125%R). - %R >125% J positive results for affected analyte(s) for all samples in the same batch/SDG, accept NDs. - %R <75% J/UJ affected analyte(s) for all samples in the same batch/SDG. 2. Was the spike performed on a FB/EB or TB? If yes, J all sample data? 3. Was a sample spiked at the frequency of 1/batch or 20 samples?				
Laboratory Control Sample Data Included in Lab Package?	x			
1. LCS %R (80-120%R) criteria met? If no, J/UJ all affected analyte(s) for all samples in the same batch/SDG. data. 2. Was a sample spiked at the frequency of 1/batch or 20 samples? If no, J/UJ affected analyte(s) for all sample in the same batch/SDG.	x			1. Yes, all LCS recoveries met applicable quality control criteria. 2. Yes
Laboratory Duplicate Data Included in Lab Package?		x		Laboratory performs MS/MSD in place of Lab Duplicate
<u>Aqueous</u> If RPD is >20% but <100% and sample and duplicate results are >5x the QL, estimate (J) results > the QL. If RPD is >100%, reject (R) results \geq the QL. If sample and/or duplicate is <5x the QL and absolute difference is > the QL, estimate (J) positive results <5x the QL and nondetects (UJ). If absolute difference is > 2x the QL, reject (R) non detects and positive results <5x the QL. <u>SOIL</u> : If RPD is >35% but <120% and sample and duplicate results are >5x the QL, estimate (J) results > the QL. If RPD is > 120%, reject (R) results > the QL. If sample and/or duplicate is <5x the QL and absolute difference is >2x the QL, estimate (J) positive results <5x QL and nondetects (UJ). If absolute difference is >4x the QL, reject (R) non detects and positive results <5x QL.			x	Batch QC used, which is not applicable to this SDG. Batch QC used, which is not applicable to this SDG.

ITEM	YES	NO	N/A	COMMENTS
Field Duplicate Data Included in Lab Package?		x		none in this SDG
<p><u>Aqueous</u></p> <p>If RPD is >20% but <100% and sample and field duplicate results are >5x the QL, estimate (J) results > the QL. If RPD is >100%, reject (R) results ≥ the QL. If sample and/or duplicate is <5x the QL and absolute difference is > the QL, estimate (J) positive results <5x the QL and nondetects (UJ). If absolute difference is > 2x the QL, reject (R) non detects and positive results <5x the QL.</p> <p><u>SOIL:</u></p> <p>If RPD is >35% but <120% and sample and field duplicate results are >5x the QL, estimate (J) results > the QL. If RPD is > 120%, reject (R) results ≥ the QL. If sample and/or duplicate is <5x the QL and absolute difference is >2x the QL, estimate (J) positive results <5x QL and nondetects (UJ). - If absolute difference is >4x the QL, reject (R) non detects and positive results <5x QL.</p>			x	

Holding Times

Sample ID	Method	Days from Sampling to Prep	Days from Prep to Analysis	Days from Sampling to Analysis	Sampling to Prep Status	Prep to Analysis Status	Sampling to Analysis Status
EF-EB20120912	SW6010	9	2	11			OK @180 days
EF-B107-0.5-1.0	SW6010	9	1	10			OK @180 days
EF-B107-0.5-1.0	SW6010	9	5	14			OK @180 days

Percent Solids

Sample ID	Percent Solids (%)	Status
EF-B107-0.5-1.0	86.3	ok @50%

Data Validation Report

Project:	PPG – Garfield Avenue Supplemental Remedial Investigation (GARIS) EF Additional RI Delineation Borings	
Laboratory:	Accutest, Dayton, NJ	
Laboratory Job No.:	JB16587	
Analysis/Method:	Hexavalent Chromium SW846 3060A/7196A	
Validation Level:	Full (Hexavalent Chromium)	
Site Location/Address:	PPG Site 114 – Garfield Avenue, Jersey City, NJ	
AECOM Project Number:	60154801.0004	
Prepared by:	Justin Webster/AECOM	Completed on: October 11, 2012
Reviewed by:	Lisa Krowitz/AECOM	File Name: 2012-10-11 DV Report JB16587-F

Introduction

The data were reviewed in accordance with the FSP-QAPP and the following NJDEP and/or Region 2 validation Standard Operating Procedure (SOP):

- NJDEP Office of Data Quality SOP 5.A.10, Rev 3 (September 2009), SOP for Analytical Data Validation of Hexavalent Chromium – for USEPA SW-846 Method 3060A, USEPA SW-846 Method 7196A and USEPA SW-846 Method 7199;

The results of quality control data analyzed with site samples were used to assess the overall reliability of the data. The following qualifiers were used to identify data quality issues:

- U: Indicates the analyte was not detected in the sample above the sample reporting limit.
- J: Indicates the result was an estimated value; the associated numerical value was an approximate concentration of the analyte in the sample.
- UJ: Indicates the analyte was not detected above the reporting limit and the reporting limit was approximate.
- R: The sample result was rejected due to serious deficiencies; the presence or absence of the analyte could not be confirmed.

Sample Information

The samples listed below were collected by AECOM on September 17, 2012 as part of the Garfield Avenue Supplemental Remedial Investigation (GARIS) Additional RI Delineation Borings (EF) sampling at the PPG Site - 114 Jersey City, New Jersey.

Field ID	Laboratory ID	Matrix	Fraction
EF-EB20120917 (Equipment Blank)	JB16587-7	Aqueous	Hexavalent Chromium
EF-B113-0.5-1.0	JB16587-1	Soil	Hexavalent Chromium
EF-B113-1.0-1.5	JB16587-2	Soil	Hexavalent Chromium
EF-B113-2.0-2.5	JB16587-3	Soil	Hexavalent Chromium
EF-B113-2.0-2.5X (Field Duplicate of EF-B113-2.0-2.5)	JB16587-4	Soil	Hexavalent Chromium
EF-B113-22.2-22.7	JB16587-5	Soil	Hexavalent Chromium
EF-B113-25.0-25.5	JB16587-6	Soil	Hexavalent Chromium

The samples were collected following the procedures detailed in the Remedial Investigation Work Plan – Soil for Non-Residential Chromate Chemical Production Waste Sites 114, 132, 133, 135, 137, 143, and 186, Jersey City, New Jersey and the Field Sampling Plan/Quality Assurance Project Plan for Non-Residential and Residential Chromium Sites Hudson County, New Jersey (December 2011).

General Comments

The data package was complete. Quality control (QC) issues identified during validation are discussed below. Refer to the Soil Target Analyte Summary Hit List for a listing of all detected results, qualified results, and associated qualifications, where applicable.

Hexavalent Chromium

Matrix Spike Results

Sample EF-B113-2.0-2.5 (JB16587-2) was selected for the soil matrix spike analysis and used for supporting data quality recommendations. The soluble and insoluble matrix spike (MS) recoveries from batch GN73146 were 82.2% and 92.7%, respectively; the soluble and insoluble MS recoveries met quality control criteria of 75-125%R. The post digestion spike (PDS) recovery was 101%, which met the PDS criteria of 85-115%. No data qualification was required on the basis of spike recoveries.

Data Quality and Usability

In general, these data appear to be valid and may be used for decision-making purposes. No data were rejected. Qualified results, if applicable, are discussed in attachments A and B below.

Sample results were detected between the RL and MDL are usable as estimated values.

Attachments

Attachment A Target Analyte Summary Hitlist(s)

Attachment B Data Validation Report Form

Attachment A

Target Analyte Summary Hitlist(s)

Soil Target Analyte Summary Hit List (Hexavalent Chromium)

Site Name PPG –GARIS Additional RI Delineation Borings at PPG Site 114, Jersey City, NJ
Sampling Date September 17, 2012
Lab Name/ID Accutest Laboratories, Dayton, NJ
SDG No JB16587
Sample Matrix Soil
Trip Blank ID NA
Field Blank ID EF-EB20120917

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
EF-B113-0.5-1.0	JB16587-1	CHROMIUM (HEXAVALENT)	U	0.19	0.19	0.44	Qualify	31
EF-B113-1.0-1.5	JB16587-2	CHROMIUM (HEXAVALENT)	U	0.30	0.30	0.45	Qualify	31
EF-B113-2.0-2.5	JB16587-3	CHROMIUM (HEXAVALENT)	U	0.25	0.25	0.47	Qualify	31
EF-B113-2.0-2.5X	JB16587-4	CHROMIUM (HEXAVALENT)	U	0.56	0.56	0.46		
EF-B113-22.2-22.7	JB16587-5	CHROMIUM (HEXAVALENT)	U	217	217	12		
EF-B113-25.0-25.5	JB16587-6	CHROMIUM (HEXAVALENT)	U	105	105	4.5		

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

NJDEP Laboratory Footnote

1. The value reported is less than or equal to 3x the value in the preparation/reagent blank. It is the policy of NJDEP-DPFSR to negate the reported value due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
2. The value reported is greater than three (3) times but less than ten (10) times the value in the preparation/reagent blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to the preparation/reagent blank contamination. The "B" qualifier alerts the end-user to the presence of this analyte in the preparation/reagent blank.
3. The value reported is less than or equal to three (3) times the value in the trip/field blank. It is the policy of NJDEP-DPFSR to negate the reported value as due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.

4. The value reported is greater than three (3) times but less than ten (10) times the value in the trip/field blanks and is considered "real". However, the reported value must be quantitatively qualified "J" due to trip/field blank contamination.
5. The concentration reported by the laboratory is incorrectly calculated.
6. The laboratory failed to report the presence of the analyte in the sample.
7. The reported Hexavalent Chromium value was qualified because the Calibration Check Standard was not within the recovery range (90-110 percent).
8. In the Duplicate Sample Analysis, Hexavalent Chromium fell outside the control limits of ± 20 percent for sample results $> 4xRL$ or $\pm RL$ for sample results $< 4xRL$. Therefore, the result was qualified.
9. This analyte was rejected because the laboratory performed the Duplicate Analysis on a field blank.
10. The reported value was qualified because the PVS recovery was greater than 115 percent.
11. The reported value was qualified because the PVS recovery was less than 85 percent.
12. The non-detected value was qualified (UJ) because the PVS recovery was less than 85 percent. The possibility of a false negative exists.
13. The reported analyte was qualified because the associated Calibration Blank result was greater than the MDL.
14. The laboratory made a transcription error. No hits were found in the raw data.
15. This analyte is rejected because the laboratory exceeded the holding time for digestion and analysis.
16. The laboratory subtracted the preparation/reagent blank from the sample result. The Reviewer's calculation puts the preparation/reagent blank back into the result.
17. The photocopy is unreadable. Therefore, the QA reviewer cannot read the laboratory's reported concentration result.
18. The reported value was qualified because the predigestion spike recovery was less than 75 %, but greater than 50%.
19. The reported value was qualified because the predigestion spike recovery was greater than 125 percent.
20. The non-detected value was qualified (UJ) because the redigestion spike recovery was less than 75 percent. The possibility of a false negative exists.
21. The reported result was qualified or rejected because the laboratory did not record the pH value(s) of the sample in a laboratory notebook.

22. The reported value was qualified (J/UJ) because the sample moisture content exceeded 50 percent.
23. The sample result was rejected because the soluble and insoluble matrix spike recoveries were less than 50%.
24. The detected sample result was qualified (J) because the incorrect spike concentration was used.
25. The reported sample results were rejected because the predigestion spike recovery was greater than 150 percent.
26. The reported sample results were rejected because the redigestion spike recovery was greater than 150 percent.
27. The reported value was qualified (J) because the redigestion spike recovery was less than 75 percent.
28. The reported value was qualified (J/UJ) because the sample digestion temperature was less than 90°C.
29. In the Field Duplicate Sample Analysis, Hexavalent Chromium fell outside the control limits of $\leq 20\%$ for sample results $> 4xRL$ or $\pm RL$ for sample results $< 4xRL$. Therefore, the result was qualified.
30. The reported value was qualified as estimated (J/UJ) but the bias is uncertain due to both high and low MS recoveries.
31. The reported result was greater than the MDL but less than the RL and qualified (J) as estimated by the laboratory.
32. The reported value was qualified because the sample replicate precision criterion of $\leq 20\%$ for method 7199 was exceeded.
33. The reported value was qualified (J/UJ) because the laboratory control sample (LCS) recovery was less than 80%.
34. The reported value was qualified (J) because the laboratory control sample (LCS) recovery was greater than 120%.
35. The reported result was qualified because the matrix spike analysis was not performed at the proper frequency.
36. The reported result was qualified because the laboratory duplicate analysis was not performed at the proper frequency.
37. The result was qualified because the cooler temperature upon sample receipt exceeded 6°C.
38. The reported value was qualified because the redigestion spike recovery was greater than 125 percent.
39. The reported result was rejected because the laboratory failed to perform the reanalysis due to insufficient sample volume.
40. The reported results was qualified because the laboratory failed to analyze an ending CCB.

Attachment B

Data Validation Report Form

Client Name: PPG Industries	Project Number: 60154801.0004
Site Location: PPG- GARIS Additional RI Delineation Borings	Project Manager: Robert Cataldo
Laboratory: Accutest, Dayton, New Jersey	Limited or <u>Full Validation</u> (circle one)
Laboratory Job No: JB16587	Date Checked: 10/05/2012
Validator: Justin Webster	Peer: Lisa Krowitz

ITEM	YES	NO	N/A	COMMENTS
Sample results included?	x			6 soils and 1 EB
Reporting Limits met project requirements?	x			
Field I.D. included?	x			
Laboratory I.D. included?	x			
Sample matrix included?	x			
Sample receipt temperature 2-6°C?	x			4.0°C
Signed COCs included?	x			
Date of sample collection included?	x			09/17/2012
Date of sample digestion included?	x			Soil: JB16587 HxCr prepped on 10/02/2012
Holding time to digestion met criteria? Soils -30 days from collection to digestion.	x			Yes
Date of analysis included?	x			Soil: JB16587: HxCr analyzed on 10/03/2012. AQ: 09/17/2012
Holding time to analysis met criteria? Soils -168 hours from digestion to analysis. Aqueous – 24 hours from collection to analysis.	x			Yes
Method reference included?	x			3060A/7196A
Laboratory Case Narrative included?	x			
Definitions: MDL – Method Detection Limit; %R – Percent Recovery; RL – Reporting Limit; RPD – Relative Percent Difference; RSD – Relative Standard Deviation :Corr – Correlation Coefficient.				
Comments				
Field Duplicates: Sample EF-B113-2.0-2.5X was sent as the FD for EF-B113-2.0-2.5, See "Field Duplicate" table below for results.				
Percent Solids: all samples >50%, no qualifications				
Sample Dilutions: EF-B113-22.2-22.7 (25x), EF-B111-25.0-25.5(10x)				

ITEM	YES	NO	N/A	COMMENTS
Initial Calibration Documentation Included in Lab Package?	x			Cal source (soil – Absolute lot # 072512); (AQ Absolute Lot #031912)
1. Blank plus 4 standards (7196A) or blank plus 3 standards (7199), 2. Correlation coefficient of ≥ 0.995 (7196A) or ≥ 0.999 (7199). 3. Calibrate daily or each time instrument is set up.	x x x			1. Each analysis 1 blank and 7 cal STDs 2. All analyses meet CC 3. Yes
Calibration Check Standard (CCS) for 7196A and Quality Control Sample (QCS) for 7199 Included in Lab Package?	x			Check source (soil and AQ – Ultra lot # L00439)
1. %R criteria met? (90 - 110%). 2. Correct frequency of once every 10 samples 3. CCS and QCS from independent source and at mid level of calibration curve.	x x x			1. All met %R 2. Analyzed every 10 samples 3. Yes
Calibration Blanks	x			
1. Analyzed prior to initial calibration standards and after each CCS/QCS? 2. Absolute value should not exceed MDL.	x x			1. Yes 2. Yes
Method Blank and Field Blanks Included in Lab Package?	x			Equipment Blank EF-EB20120917
1. Method blank analyzed with each preparation batch? 2. Absolute value should not exceed MDL.	x x			1. Yes 2. Yes, all method and field blanks were less than MDL.
Eh and pH data.	x			
Eh and pH data was included and plotted for all samples?	x			
Soluble Matrix Spike Data Included in Lab Package?	x			JB16587-2 [EF-B113-1.0-1.5]
1. %R criteria met? (75-125%R). 2. Was the spike concentration 40 mg/Kg or twice the sample concentration, whichever is greater? 3. Was a sample spiked at the frequency of 1/batch or 20 samples?	x x x			1. Yes, (82.2%) 2. Yes, 39.3 mg/kg. 3. Yes.
Insoluble Matrix Spike Data Included in Lab Package?	x			JB16587-2 [EF-B113-1.0-1.5]
1. %R criteria met? (75-125%R). 2. Was the spike concentration around 400 to 800 mg/Kg? 3. Was a sample spiked at the frequency of 1/batch or 20 samples?	x x x	x		1. Yes, (92.7%) 2. Yes, 804 mg/kg. 3. Yes.
Post Digestion Spike	x			JB16587-2 [EF-B113-1.0-1.5]
1. %R criteria met? (85-115%R). 2. Was the spike concentration 40 mg/Kg or twice the sample concentration? 3. Was a sample spiked at the frequency of 1/batch or 20 samples?	x x x			1. Yes (101%) 2. Yes, 41.6 mg/kg 3. Yes.
Sample Duplicate Data Included in Lab Package?	x			JB16587-2 [EF-B113-1.0-1.5]
1. RPD criteria met? (RPD < 20%) of both results are $\geq 4x$ RL or control limit of $\pm RL$ if both results are $< 4x$ RL. 2. Was a sample spiked at the frequency of 1/batch or 20 samples?	x x			1. Yes, control limit of $\pm RL$ met for results $< 4x$ RL was met; no qualifications 2. Yes
Was a Laboratory Control Sample (LCS) Included in Lab Package?	x			
1. %R criteria met? (80-120%R). 2. Was an LCS analyzed at the frequency of 1/batch or 20 samples?	x x			1. Yes, all LCS recoveries were within quality control criteria. 2. Yes
Miscellaneous Items.				
1. For soils by 3060A, was the initial pH within a range of 7.0-8.0? 2. For soils by 7199, was the pH within a range of 9.0-9.5? 3. For aqueous by 7196A, was the pH with a range of 1.5-2.5? 4. For soils (3060A), was the digestion temperature 90-95°C for at least 60 minutes? 5. For 7199, was each sample injected twice and was the RPD ≤ 20 ?	x x x x		x x	1. Yes 2. NA 3. Yes 4. Yes 5. NA

SDG#: JB16587
Batch: GN73146
 Cr+6 ICAL 10/02/2012
 Soil
 (p. 38 of data pkg)

x - concentration	y - response
0	0
0.01	0.009
0.05	0.045
0.1	0.09
0.3	0.271
0.5	0.447
0.8	0.717
1	0.887

(p. 38 of data pkg)

AECOM Calculated Intercept	0.0012	OK	Reported intercept	0.0012
AECOM Slope	0.8900	OK	Reported Slope	0.89
AECOM Calculated r	0.99997	OK	Reported r	0.99997

LCS calculation GP67567-B1 pgs. 38

Background Absorbance	0
Total absorbance	0.865
Total absorbance - background	0.865
Instrument Concentration (mg/L)	0.971
Sample weight (kg)	0.0025
Final Volume (L)	0.1
Dilution Factor	1

AECOM Calculated LCS Result (mg/Kg)	38.8	OK	Reported Result (mg/Kg)	38.8
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%R = Found/True*100 GP67567-B1 pg. 23

True Value (mg/kg)	40
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AECOM Calculated %R	97.1	OK rounding	Reported %R	97.0
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MS calculation GP67567-S2 EF-B113-2.0-2.5 pg. 38

Background reading	0
Total absorbance	0.333
Total absorbance - background	0.333
Instrument Concentration (mg/L)	0.3728
Sample weight (kg)	0.0025
Final Volume (L)	0.1
Percent solids	0.895
Dilution Factor	50

AECOM Calculated MS Result (mg/Kg)	833	OK	Reported Result (mg/Kg)	833
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%R = Found/True*100 EF-B113-2.0-2.5 pg. 25

True Value (mg/kg)	898
Native concentration (mg/Kg)	0

AECOM %R	92.8	OK rounding	Reported %R	92.7
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Percent Solids EF-B113-2.0-2.5 pg. 26

Empty dish weight (g)=	22.65
Wet weight (g)=	29.11
Dry weight (g)=	28.43

AECOM %solids =	89.5	OK	reported %solids=	89.5
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Reporting Limit EF-B113-22.2-22.7 pg. 12, 38

Low Standard	0.01
Initial weight (kg)	0.00255
Final volume (L)	0.1
Percent solids	0.850
Dilution Factor	25

Reporting Limit	11.5	OK rounding	Reported RL (mg/Kg)=	12
-----------------	------	-------------	----------------------	----

Sample Calculations**EF-B113-22.2-22.7****pg. 12, 38**

Background reading	0.001		
Total absorbance	0.17		
Total absorbance - background	0.169		
Instrument Response (mg/L)	0.189		
Sample weight (kg)	0.00255		
Final Volume (L)	0.1		
Percent solids	0.85		
Dilution Factor	25		
AECOM Calculated Result (mg/Kg)	217	OK	Reported Result (mg/Kg) 217.00

Field Duplicate

Sample ID	Duplicate ID	Compound	Sample Result	Sample Lab Qualifier	Duplicate Result	Dup Lab Qualifier	QL	Units	RPD	Action
EF-B113-2.0-2.5	EF-B113-2.0-2.5X	CHROMIUM (HEXAVALENT)	0.25	B	0.56		0.47	mg/kg	76.5	None, both results <4xRL and \pm RL

Percent Solids

Sample ID	Percent Solids (%)	Status
EF-B113-0.5-1.0	91.1	ok @50%
EF-B113-1.0-1.5	89.5	ok @50%
EF-B113-2.0-2.5	84.8	ok @50%
EF-B113-2.0-2.5X	86.3	ok @50%
EF-B113-22.2-22.7	85	ok @50%
EF-B113-25.0-25.5	89.3	ok @50%

Holding Time

Sample ID	Method	Days from Sampling to Prep	Days from Prep to Analysis	Days from Sampling to Analysis	Sampling to Prep Status	Prep to Analysis Status	Sampling to Analysis Status
EF-EB20120917	SW7196			0			OK @1 days
EF-B113-0.5-1.0	SW7196	15	1	16	OK @30 days	OK @7 days	OK @37 days
EF-B113-1.0-1.5	SW7196	15	1	16	OK @30 days	OK @7 days	OK @37 days
EF-B113-2.0-2.5	SW7196	15	1	16	OK @30 days	OK @7 days	OK @37 days
EF-B113-2.0-2.5X	SW7196	15	1	16	OK @30 days	OK @7 days	OK @37 days
EF-B113-22.2-22.7	SW7196	15	1	16	OK @30 days	OK @7 days	OK @37 days
EF-B113-25.0-25.5	SW7196	15	1	16	OK @30 days	OK @7 days	OK @37 days

Data Validation Report

Project: PPG Garfield Avenue Remedial Action – 98 Forrest St Soil Borings

Laboratory: Accutest, Dayton, NJ

Laboratory Job No.: JB48426 and JB48426R

Analysis/Method: Hexavalent Chromium SW846 3060A/7196

Validation Level: Full (Hexavalent Chromium)

Site Location/Address: PPG Site 133 - Garfield Avenue Jersey City, NJ

AECOM Project No: 60279173.GA.RI.FOR.ANNEX

Prepared by: Paula DiMattei /AECOM Completed on: 10/17/2013

Reviewed by: Lisa Krowitz /AECOM File Name: JB448426_R_2013-10-17 DV Report-F

Introduction

The data were reviewed in accordance with the FSP-QAPP and the following NJDEP and Region 2 validation Standard Operating Procedure(s) (SOP):

- NJDEP Office of Data Quality SOP 5.A.10, Rev 3 (September 2009), SOP for Analytical Data Validation of Hexavalent Chromium - for USEPA SW-846 Method 3060A, USEPA SW-846 Method 7196A and USEPA SW-846 Method 7199;

The results of quality control data analyzed with site samples were used to assess the overall reliability of the data. The following qualifiers were used to identify data quality issues:

- U: Indicates the analyte was not detected in the sample above the sample reporting limit.
- J: Indicates the result was an estimated value; the associated numerical value was an approximate concentration of the analyte in the sample.
- UJ: Indicates the analyte was not detected above the reporting limit and the reporting limit was approximate.
- R: The sample result was rejected due to serious deficiencies; the presence or absence of the analyte could not be confirmed.
- RA: The sample result was rejected but is still considered usable.

Sample Information

The samples listed below were collected by AECOM on September 25, 2013 as part of the PPG Garfield Avenue Remedial Action – 98 Forrest St. soil sampling at the PPG Site, Jersey City, New Jersey. Only the samples and parameters listed below were validated.

Field ID	Laboratory ID	Matrix	Fraction
FS-FB09252013 (Equipment Blank)	JB48426-12	Aqueous	Hexavalent Chromium
FS-B19-0.5-1.0	JB48426-2, -2R	Soil	Hexavalent Chromium
FS-B19-1.5-2.0	JB48426-3, -3R	Soil	Hexavalent Chromium
FS-B19-11.5-12.0	JB48426-9, -9R	Soil	Hexavalent Chromium
FS-B19-12.8-13.3	JB48426-10, -10R	Soil	Hexavalent Chromium
FS-B19-13.3-13.8	JB48426-11, -11R	Soil	Hexavalent Chromium
FS-B19-3.5-4.0	JB48426-4, -4R	Soil	Hexavalent Chromium
FS-B19-3.5-4.0X Field Duplicate of FS-B19-3.5-4.0	JB48426-5, -5R	Soil	Hexavalent Chromium
FS-B19-5.5-6.0	JB48426-6, 6R	Soil	Hexavalent Chromium
FS-B19-7.5-8.0	JB48426-7, -7R	Soil	Hexavalent Chromium
FS-B19-9.5-10.0	JB48426-8, -8R	Soil	Hexavalent Chromium
FS-B20-0.5-1.0	JB48426-13, -13R	Soil	Hexavalent Chromium
FS-B20-1.5-2.0	JB48426-14, -14R	Soil	Hexavalent Chromium
FS-B20-10.0-10.5	JB48426-19, -19R	Soil	Hexavalent Chromium
FS-B20-3.5-4.0	JB48426-15, -15R	Soil	Hexavalent Chromium
FS-B20-5.5-6.0	JB48426-16, -16R	Soil	Hexavalent Chromium
FS-B20-7.5-8.0	JB48426-17, -17R	Soil	Hexavalent Chromium
FS-B20-9.5-10.0	JB48426-18, -18R	Soil	Hexavalent Chromium
FS-CC19-0.0-0.5	JB48426-1, -1R	Soil	Hexavalent Chromium

The samples were collected following the procedures detailed in the Draft Work Scope and Budget Estimate for Site Inspection and Investigation Activities for 98 Forrest Street, Jersey City, New Jersey and the Field Sampling Plan/Quality Assurance Project Plan for Non-Residential and Residential Chromium Sites Hudson County, New Jersey (December 2011).

General Comments

The data package was complete. Quality control (QC) issues identified during validation are discussed below. Refer to the Target Analyte Summary Hit List for a listing of all detected results, qualified results, and associated qualifications, where applicable.

Hexavalent Chromium

MS Results

Sample FS-B19-1.5-2.0 (JB48426-3) was selected for the soil matrix spike analysis and used for supporting data quality recommendations. The soluble and insoluble matrix spike (MS) recoveries from the initial batch were 0.3% and 69.6%, respectively. The soluble and insoluble MS recoveries did not meet the quality control criteria of 75-125%R. The post digestion spike (PDS) recovery and pH-adjusted PDS recovery were 72.5% and 84.1%, respectively, which did not meet the PDS criteria of 85-115%.

Based on poor MS recoveries, less than 75%R, the MS and associated samples were reanalyzed using Method 7196. Sample FS-B19-1.5-2.0 (JB48426-3R) was again selected for the soil matrix spike analysis. The soluble and insoluble MS recoveries from the re-analysis were 13.8% and 85.3%, respectively. Again, the soluble MS did not meet the quality control criteria of 75-125%R. The post spike result for the re-analysis batch was recovered at 85.1%, which met the PDS criteria of 85-115%.

Since the soluble MS recoveries were outside the acceptable QC limit of 75-125% in the initial analysis, additional parameters were analyzed to determine if possible matrix interferences could be the cause for the poor matrix spike recoveries. All the soil samples were tested for pH and oxidation reduction potential (ORP) and plotted on an Eh/pH phase diagram chart. From this chart, the source sample for the matrix spike analysis was plotted below the phase change line, indicating reducing potential within the sample matrix, incapable of supporting hexavalent chromium. Analyses for ferrous iron, sulfide screen, and total organic carbon (TOC) were performed on the MS source sample to confirm the oxidizing/reducing potential within the sample matrix. The sulfide screen was reported as nondetect, indicating no reducing agents within the sample matrix; however, the ferrous iron (2.0%) and the TOC results (71,800 mg/Kg) were positive, indicating potential reducing agents within the sample matrix.

Since the MS recoveries from the reanalysis batch were similar to the initial analysis batch, the higher of the two detected results were reported for each associated sample. Since the insoluble MS recovery from the initial batch was below 75%R but greater than 50% and was within criteria for the re-analysis batch, the positive hexavalent chromium results in all soil samples were qualified as estimated (J).

No qualification was taken on the low initial PDS recovery since the PDS recovery was acceptable in the reanalysis.

Sample Results

Reported results (flagged B by the laboratory) that were less than the reporting limit (RL), but greater than or equal to the method detection limit (MDL) are approximate values and have been qualified as estimated (J).

Data Quality and Usability

In general, these data appear to be valid and may be used for decision-making purposes. No data were rejected. Qualified results, if applicable, are presented in Attachments A and B.

All the reported hexavalent chromium soil results in this SDG are usable as estimated values with the potential for low bias due to low soluble and/or insoluble MS recoveries, and since the MS sample matrix appears to be reducing based on the Eh-pH plot and the presence of TOC and ferrous iron.

Sample results reported less than the RL, but greater than the MDL are usable as estimated values.

ATTACHMENTS

Attachment A: Target Analyte Summary Hitlist(s)

Attachment B: Data Validation Report Form

Attachment A

Target Analyte Summary Hitlist(s)

Soil Target Analyte Summary Hit List (Hexavalent Chromium)

Site Name PPG Garfield Avenue Remedial Action – 98 Forrest St Soil Borings
Sampling Date September 25, 2013
Lab Name/ID Accutest, Dayton, NJ
SDG No JB48426 and JB48426R
Sample Matrix Soil
Trip Blank ID NA
Field Blank ID FS-FB09252013

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
FS-B19-0.5-1.0	JB48426-2	CHROMIUM (HEXAVALENT)	U	5.0	5.0	0.50	Qualify	18
FS-B20-0.5-1.0	JB48426-13	CHROMIUM (HEXAVALENT)	U	6.0	6.0	0.51	Qualify	18
FS-B20-1.5-2.0	JB48426-14	CHROMIUM (HEXAVALENT)	U	14.6	14.6	0.55	Qualify	18
FS-B20-9.5-10.0	JB48426-18	CHROMIUM (HEXAVALENT)	U	0.17	0.17	0.51	Qualify	18, 31
FS-B19-1.5-2.0	JB48426-3R	CHROMIUM (HEXAVALENT)	U	0.65	0.65	0.51	Qualify	18
FS-B19-11.5-12.0	JB48426-9R	CHROMIUM (HEXAVALENT)	U	0.73	0.73	0.49	Qualify	18
FS-B19-12.8-13.3	JB48426-10R	CHROMIUM (HEXAVALENT)	U	0.91	0.91	0.47	Qualify	18
FS-B19-13.3-13.8	JB48426-11R	CHROMIUM (HEXAVALENT)	U	0.29	0.29	0.49	Qualify	18, 31
FS-B19-3.5-4.0	JB48426-4R	CHROMIUM (HEXAVALENT)	U	0.26	0.26	0.51	Qualify	18, 31
FS-B19-3.5-4.0X	JB48426-5R	CHROMIUM (HEXAVALENT)	U	0.29	0.29	0.49	Qualify	18, 31
FS-B19-5.5-6.0	JB48426-6R	CHROMIUM (HEXAVALENT)	U	0.43	0.43	0.52	Qualify	18, 31
FS-B19-7.5-8.0	JB48426-7R	CHROMIUM (HEXAVALENT)	U	0.66	0.66	0.63	Qualify	18
FS-B19-9.5-10.0	JB48426-8R	CHROMIUM (HEXAVALENT)	U	0.72	0.72	0.49	Qualify	18
FS-B20-10.0-10.5	JB48426-19R	CHROMIUM (HEXAVALENT)	U	0.96	0.96	0.48	Qualify	18
FS-B20-3.5-4.0	JB48426-15R	CHROMIUM (HEXAVALENT)	U	0.84	0.84	0.50	Qualify	18
FS-B20-5.5-6.0	JB48426-16R	CHROMIUM (HEXAVALENT)	U	0.27	0.27	0.46	Qualify	18, 31
FS-B20-7.5-8.0	JB48426-17R	CHROMIUM (HEXAVALENT)	U	0.75	0.75	0.65	Qualify	18
FS-CC19-0.0-0.5	JB48426-1R	CHROMIUM (HEXAVALENT)	U	2.6	2.6	0.45	Qualify	18

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

NJDEP Laboratory Footnote

1. The value reported is less than or equal to 3x the value in the preparation/reagent blank. It is the policy of NJDEP-DPFSR to negate the reported value due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.

2. The value reported is greater than three (3) times but less than ten (10) times the value in the preparation/reagent blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to the preparation/reagent blank contamination. The "B" qualifier alerts the end-user to the presence of this analyte in the preparation/reagent blank.
3. The value reported is less than or equal to three (3) times the value in the trip/field blank. It is the policy of NJDEP-DPF SR to negate the reported value as due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
4. The value reported is greater than three (3) times but less than ten (10) times the value in the trip/field blanks and is considered "real". However, the reported value must be quantitatively qualified "J" due to trip/field blank contamination.
5. The concentration reported by the laboratory is incorrectly calculated.
6. The laboratory failed to report the presence of the analyte in the sample.
7. The reported Hexavalent Chromium value was qualified because the Calibration Check Standard was not within the recovery range (90-110 percent).
8. In the Duplicate Sample Analysis, Hexavalent Chromium fell outside the control limits of ≤ 20 percent for sample results $> 4xRL$ or $+ RL$ for sample results $< 4xRL$. Therefore, the result was qualified.
9. This analyte was rejected because the laboratory performed the Duplicate Analysis on a field blank.
10. The reported value was qualified because the PVS recovery was greater than 115 percent.
11. The reported value was qualified because the PVS recovery was less than 85 percent.
12. The non-detected value was qualified (UJ) because the PVS recovery was less than 85 percent. The possibility of a false negative exists.
13. The reported analyte was qualified because the associated Calibration Blank result was greater than the MDL.
14. The laboratory made a transcription error. No hits were found in the raw data.
15. This analyte is qualified or rejected because the laboratory exceeded the holding time for digestion and/or analysis.

16. The laboratory subtracted the preparation/reagent blank from the sample result. The Reviewer's calculation puts the preparation/reagent blank back into the result.
17. The photocopy is unreadable. Therefore, the QA reviewer cannot read the laboratory's reported concentration result.
18. The reported value was qualified because the predigestion spike recovery was less than 75 %, but greater than 50%.
19. The reported value was qualified because the predigestion spike recovery was greater than 125 percent.
20. The non-detected value was qualified (UJ) because the redigestion spike recovery was less than 75 percent. The possibility of a false negative exists.
21. The reported result was qualified or rejected because the laboratory did not record the pH value(s) of the sample in a laboratory notebook.
22. The reported value was qualified (J/UJ) because the sample moisture content exceeded 50 percent.
23. The sample result was rejected because the soluble and insoluble matrix spike recoveries were less than 50%.
24. The detected sample result was qualified (J) because the incorrect spike concentration was used.
25. The reported sample results were rejected because the predigestion spike recovery was greater than 150 percent.
26. The reported sample results were rejected because the redigestion spike recovery was greater than 150 percent.
27. The reported value was qualified (J) because the redigestion spike recovery was less than 75 percent.
28. The reported value was qualified (J/UJ) because the sample digestion temperature was less than 90C.
29. In the Field Duplicate Sample Analysis, Hexavalent Chromium fell outside the control limits of $\leq 20\%$ for sample results $> 4xRL$ or $+ RL$ for sample results $< 4xRL$. Therefore, the result was qualified.
30. The reported value was qualified as estimated (J/UJ) but the bias is uncertain due to both high and low MS recoveries.
31. The reported result was greater than the MDL but less than the RL and qualified (J) as estimated by the laboratory.

32. The reported value was qualified because the sample replicate precision criterion of $\leq 20\%$ for method 7199 was exceeded.
33. The reported value was qualified (J/UJ) because the laboratory control sample (LCS) recovery was less than 80%.
34. The reported value was qualified (J) because the laboratory control sample (LCS) recovery was greater than 120%.
35. The reported result was qualified because the matrix spike analysis was not performed at the proper frequency.
36. The reported result was qualified because the laboratory duplicate analysis was not performed at the proper frequency.
37. The result was qualified because the cooler temperature upon sample receipt exceeded 6C.
38. The reported value was qualified because the redigestion spike recovery was greater than 125 percent.
39. The reported result was rejected because the laboratory failed to perform the reanalysis due to insufficient sample volume.
40. The reported results was qualified because the laboratory failed to analyze an ending CCB.
41. The reported result was qualified because the laboratory failed to make the proper method specific pH adjustment.
42. The reported result was rejected because the laboratory failed to reanalyze the MS and associated sample(s) due to failed MS recoveries.

Attachment B

Data Validation Report Form

Client Name: PPG Industries	Project Number: 60279173.GA.RI.FOR.ANNEX
Site Location: PPG Garfield Avenue Remedial Action – 98 Forrest St Soil Borings, Jersey City, NJ	Project Manager: William Spronz
Laboratory: Accutest, Dayton, NJ	Type of Validation: Full
Laboratory Job No: JB48426 and JB48426R	Date Checked: 10/17/13
Validator: Paula DiMattei	Peer: Lisa Krowitz

ITEM	YES	NO	N/A	COMMENTS
Sample results included?	X			
Reporting Limits met project requirements?	X			
Field I.D. included?	X			
Laboratory I.D. included?	X			
Sample matrix included?	X			
Sample receipt temperature 2-6C?	X			
Signed COCs included?	X			
Date of sample collection included?	X			
Date of sample digestion included?	X			
Holding time to digestion met criteria? (Soils -30 days from collection to digestion.)	X			
Date of analysis included?	X			
Holding time to analysis met criteria? (Soils -168 hours from digestion to analysis; Aqueous - 24 hours from collection to analysis.)	X			
Method reference included?	X			
Laboratory Case Narrative included?	X			

Definitions: MDL - Method Detection Limit; %R - Percent Recovery; RL - Reporting Limit; RPD - Relative Percent Difference; RSD - Relative Standard Deviation :Corr - Correlation Coefficient.

ITEM	YES	NO	N/A	COMMENTS
Initial calibration documentation included in lab package?	X			
1) Blank plus 4 standards (7196A) or blank plus 3 standards (7199)	X			
2) Correlation coefficient of >0.995 (7196A) or >0.999 (7199)	X			
3) Calibrate daily or each time instrument is set up.	X			
Calibration Check Standard (CCS) for 7196A and Quality Control Sample (QCS) for 7199 Included in Lab Package?	X			
1) %R criteria met? (90 - 110%)	X			
2) Correct frequency of one per every 10 samples	X			
3) CCS and QCS from independent source and at mid-level of calibration curve	X			
Calibration Blanks	X			
1) Analyzed prior to initial calibration standards and after each CCS/QCS?	X			
2) Absolute value should not exceed MDL.	X			
Method Blank, Field Blanks and/or Equipment Blanks Included in Lab Package?	X			FS-FB09252013
1) Method blank analyzed with each preparation batch?	X			
2) Absolute value should not exceed MDL.	X			
Eh and pH Data	X			
1) Eh and pH data was included and plotted for all samples?	X			
Soluble Matrix Spike Data Included in Lab Package?	X			
1) Soluble Matrix %R criteria met? (75-125%R)		X		See nonconformance table below.
2) Was the spike concentration 40 mg/Kg or twice the sample concentration?	X			
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	X			
Insoluble Matrix Spike Data Included in Lab Package?	X			
1) Insoluble Matrix %R criteria met? (75-125%R)		X		See nonconformance table below.
2) Was the spike concentration around 400 to 800 mg/Kg?		X		Spiked at 1240 mg/kg and 1190 mg/kg; no impact to data.
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	X			
Post Digestion Spike	X			

ITEM	YES	NO	N/A	COMMENTS
1) Post Digestion Spike %R criteria met? (85-115%R)		X		See nonconformance table below
2) Was the spike concentration 40 mg/Kg or twice the sample concentration?	X			
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	X			
Sample Duplicate Data Included in Lab Package?	X			
1) RPD criteria met? (RPD ≤ 20%) if both results are ≥4x RL or absolute difference ≤ RL if either or both results are <4xRL	X			
2) Was a sample duplicate analyzed at the frequency of 1 per batch or 20 samples?	X			
Was a Laboratory Control Sample (LCS) Included in Lab Package?	X			
1) %R criteria met? (80-120%R).	X			
2) Was an LCS analyzed at the frequency of 1/batch or 20 samples?	X			
Were any Field Duplicate samples submitted with this SDG?	X			See summary table below
1) Were Field duplicate RPD criteria met? (RPD≤20% for both sample results >4xRL or absolute difference ≤ RL if either or both results are <4xRL.	X			
Were all sample quantitation and reporting requirements met?	X			
1) Were all solid samples reported with percent solids >50%?	X			
2) Were any samples analyzed or reported with dilutions?		X		
Miscellaneous Items	X			
1) For soils by 7196A, was the pH within a range of 7.0-8.0?	X			
2) For soils by 7199, was the pH within a range of 9.0-9.5?			X	
3) For aqueous by 7196A, was the pH with a range of 1.5-2.5?	X			
4) For soils (3060A), was the digestion temperature 90-95C for at least 60 minutes?	X			
5) For 7199, was each sample injected twice and was the RPD <20?			X	

Matrix Spikes

Sample ID	Compound	Analysis Batch	Matrix Spike	% Recovery	Lower Limit	Upper Limit	PDS	pH-adjusted PDS	PDS Limit
FS-B19-1.5-2.0	CHROMIUM (HEXAVALENT)	GP74837/GN92199	Soluble	0.3	75	125	72.5	84.1	85-115
	CHROMIUM (HEXAVALENT)	GP74837/GN92199	Insoluble	69.6	75	125			
	CHROMIUM (HEXAVALENT)	GP74881/GN92298	Soluble	13.8	75	125	85.1		85-115
	CHROMIUM (HEXAVALENT)	GP74881/GN92298	Insoluble	85.3	75	125			

Field Duplicates

Sample ID	Duplicate ID	Compound	Sample Result	Duplicate Result	QL	Units	RPD
FS-B19-3.5-4.0	FS-B19-3.5-4.0X	CHROMIUM (HEXAVALENT)	0.26	0.29	0.51	mg/kg	10.9

SDG#: JB48426
Batch: GN92199
Cr+6 ICAL 9/26/2013
Soil
(p. 65 of data pkg)

x - concentration	y - response
0	0
0.01	0.009
0.05	0.043
0.1	0.091
0.3	0.269
0.5	0.449
0.8	0.698
1	0.889

(p. 65 of data pkg)

AECOM Calculated Intercept	0.0011	OK	Reported intercept	0.0011
AECOM Slope	0.8837	OK	Reported Slope	0.8837
AECOM Calculated r	0.99989	OK	Reported r	0.99989

LCS calculation

GP74837-B1 pgs. 65

Background Absorbance	0			
Total absorbance	0.828			
Total absorbance - background	0.828			
Instrument Concentration	0.936			
Sample weight (mg/kg)	0.0025			
Final Volume (L)	0.1			
Dilution Factor	1			
AECOM Calculated LCS Result (mg/Kg)	37.4	OK	Reported Result (mg/Kg)	37.4

%R = Found/True*100

p. 44

True Value (mg/kg)	40			
AECOM Calculated %R	93.6	OK	Reported %R	93.5

MS calculation

JB48426-3 [FS-B19-1.5-2.0] pg. 65

Background reading	0.022			
Total absorbance	0.031			
Total absorbance - background	0.009			
Instrument Concentration	0.0089			
Sample weight (mg/kg)	0.00245			
Final Volume (L)	0.1			
Percent solids	0.789			
Dilution Factor	1			
AECOM Calculated MS Result (mg/Kg)	0.46	OK	Reported Result (mg/Kg)	0.46

%R = Found/True*100

JB48426-3 [FS-B19-1.5-2.0] p.46

True Value (mg/kg)	51.7			
Native concentration (mg/Kg)	0.28			
AECOM%R	0.35	OK	Reported %R	0.3

Percent Solids

JB48426-3 [FS-B19-1.5-2.0]

p.47

Empty dish weight=	22.83			
Wet weight=	27.90			
Dry weight=	26.83			
AECOM%solids =	78.9	OK	reported %solids=	78.9

Reporting Limit	JB48426-3 [FS-B19-1.5-2.0]		p.13	
Low Standard	0.01			
Initial weight (mg/kg)	0.00249			
Final volume (L)	0.1			
Percent solids	0.789			
Dilution Factor	1			
Reporting Limit	0.51	OK	Reported RL (mg/Kg)=	0.50

Sample Calculations

JB48426-3 [FS-B19-1.5-2.0]				
Background reading	0.054			
Total absorbance	0.06			
Total absorbance - background	0.006			
Instrument Response	0.006			
Sample weight (mg/kg)	0.00249			
Final Volume (L)	0.1			
Percent solids	0.789			
Dilution Factor	1			
AECOM Calculated Result (mg/Kg)	0.28	OK	Reported Result (mg/Kg)	0.28

JB48426-2 [FS-B19-0.5-1.0]				
Background reading	0.034			
Total absorbance	0.124			
Total absorbance - background	0.09			
Instrument Response	0.101			
Sample weight (mg/kg)	0.00253			
Final Volume (L)	0.1			
Percent solids	0.795			
Dilution Factor	1			
AECOM Calculated Result (mg/Kg)	5.0	OK	Reported Result (mg/Kg)	5.0

SDG#: JB48426R
Batch: GN92298
Cr+6 ICAL 9/28/2013
Soil
(p. 69 of data pkg)

x - concentration	y - response
0	0
0.01	0.009
0.05	0.044
0.1	0.089
0.3	0.271
0.5	0.449
0.8	0.697
1	0.907

(p. 69 of data pkg)

AECOM Calculated Intercept	-0.0004	OK	Reported intercept	-0.0004
AECOM Slope	0.8947	OK	Reported Slope	0.8947
AECOM Calculated r	0.99969	OK	Reported r	0.99969

LCS calculation **GP74881-B1 pgs. 69**

Background Absorbance	0			
Total absorbance	0.88			
Total absorbance - background	0.88			
Instrument Concentration	0.984			
Sample weight (mg/kg)	0.0025			
Final Volume (L)	0.1			
Dilution Factor	1			
AECOM Calculated LCS Result (mg/Kg)	39.4	OK	Reported Result (mg/Kg)	39.4

%R = Found/True*100 **p. 41**

True Value (mg/kg)	40			
AECOM Calculated %R	98.4	OK	Reported %R	98.5

MS calculation **JB48426-3R [FS-B19-1.5-2.0] pg. 69**

Background reading	0.02			
Total absorbance	0.154			
Total absorbance - background	0.134			
Instrument Concentration	0.1502			
Sample weight (mg/kg)	0.00252			
Final Volume (L)	0.1			
Percent solids	0.789			
Dilution Factor	1			
AECOM Calculated MS Result (mg/Kg)	7.6	OK	Reported Result (mg/Kg)	7.6

%R = Found/True*100 **JB48426-3R [FS-B19-1.5-2.0] pg. 43**

True Value (mg/kg)	50.3			
Native concentration (mg/Kg)	0.65			
AECOM%R	13.7	OK	Reported %R	13.8

Percent Solids **JB48426-3R [FS-B19-1.5-2.0] pg. 49**

Empty dish weight=	22.83			
Wet weight=	27.90			
Dry weight=	26.83			
AECOM%solids =	78.9	OK	reported %solids=	78.9

Reporting Limit**JB48426-3R [FS-B19-1.5-2.0] pg. 12**

Low Standard	0.01
Initial weight (mg/kg)	0.00248
Final volume (L)	0.1
Percent solids	0.789
Dilution Factor	1

Reporting Limit	0.51	OK	Reported RL (mg/Kg)=	0.51
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Sample Calculations**JB48426-3R [FS-B19-1.5-2.0] pg. 12**

Background reading	0.02
Total absorbance	0.031
Total absorbance - background	0.011
Instrument Response	0.013
Sample weight (mg/kg)	0.00248
Final Volume (L)	0.1
Percent solids	0.789
Dilution Factor	1

AECOM Calculated Result (mg/Kg)	0.65	OK	Reported Result (mg/Kg)	0.65
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JB48426-2R [FS-B19-0.5-1.0] pg. 11

Background reading	0.175
Total absorbance	0.233
Total absorbance - background	0.058
Instrument Response	0.065
Sample weight (mg/kg)	0.00248
Final Volume (L)	0.1
Percent solids	0.795
Dilution Factor	1

AECOM Calculated Result (mg/Kg)	3.3	OK	Reported Result (mg/Kg)	3.3
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Data Validation Report

Project:	PPG Garfield Avenue Supplemental Remedial Investigation (GARIS) Forrest Street Soil	
Laboratory:	Accutest, Dayton, NJ	
Laboratory Job No.:	JB59311 and JB59311R	
Analysis/Method:	Hexavalent Chromium SW846 3060A/7196 Metals by ICP-AES/ SW846-6010	
Validation Level:	Full (Hexavalent Chromium) Limited (Metals)	
Site Location/Address:	Forrest Street, Jersey City, NJ	
AECOM Project No:	60154801.6001A	
Prepared by:	Paula DiMattei /AECOM	Completed on: 04/17/2014
Reviewed by:	Lisa Krowitz /AECOM	File Name: JB59311_R_2014-04-17_DV Report-F

Introduction

The data were reviewed in accordance with the FSP-QAPP and the following NJDEP validation Standard Operating Procedures (SOP):

- NJDEP Office of Data Quality SOP 5.A.10, Rev 3 (September 2009), SOP for Analytical Data Validation of Hexavalent Chromium - for USEPA SW-846 Method 3060A, USEPA SW-846 Method 7196A and USEPA SW-846 Method 7199;
- NJDEP Office of Data Quality SOP 5.A.16, Rev 1 (May 2002), Quality Assurance Data Validation of Analytical Deliverables for Inorganics (based on USEPA SW-846 Methods)

The results of quality control data analyzed with site samples were used to assess the overall reliability of the data. The following qualifiers were used to identify data quality issues:

- U: Indicates the analyte was not detected in the sample above the sample reporting limit.
- J: Indicates the result was an estimated value; the associated numerical value was an approximate concentration of the analyte in the sample.
- UJ: Indicates the analyte was not detected above the reporting limit and the reporting limit was approximate.
- R: The sample result was rejected due to serious deficiencies; the presence or absence of the analyte could not be confirmed.
- RA: The sample result was rejected but is still considered usable.

Sample Information

The samples listed below were collected by AECOM on February 6, 2014 as part of the PPG Garfield Avenue Supplemental Remedial Investigation (GARIS) Forrest Street Soil sampling at the PPG Forrest Street site, Jersey City, NJ. Only the samples and parameters listed below were validated.

Field ID	Laboratory ID	Matrix	Fraction
FS13-0.0-0.5	JB59311-1	Soil	Hexavalent Chromium and Metals
FS13-0.0-0.5	JB59311-1R	Soil	Hexavalent Chromium
FS13-2.0-2.5	JB59311-2	Soil	Hexavalent Chromium and Metals
FS13-2.0-2.5	JB59311-2R	Soil	Hexavalent Chromium
FS13-2.0-2.5X (Field Duplicate of FS13-2.0-2.5)	JB59311-3	Soil	Hexavalent Chromium and Metals
FS13-2.0-2.5X (Field Duplicate of FS13-2.0-2.5)	JB59311-3R	Soil	Hexavalent Chromium
FS13-4.0-4.5	JB59311-4	Soil	Hexavalent Chromium and Metals
FS13-4.0-4.5	JB59311-4R	Soil	Hexavalent Chromium
FS-FB20140206 (Equipment Blank)	JB59311-5	Aqueous	Hexavalent Chromium and Metals

The samples were collected following the procedures detailed in the Remedial Investigation Work Plan - Soil for Non-Residential Chromate Chemical Production Waste Sites 114, 132, 133, 135, 137, 143, and 186, Jersey City, New Jersey, or applicable proposal or work plan, and the Field Sampling Plan/Quality Assurance Project Plan for Non-Residential and Residential Chromium Sites Hudson County, New Jersey (December 2011).

General Comments

The data package was complete. Quality control (QC) issues identified during validation are discussed below. Refer to the Target Analyte Summary Hit(s) in Attachment A for a listing of all detected results, qualified results, and associated qualifications, where applicable. The nonconformances for each section discussed below are presented in Attachment B.

Hexavalent Chromium

Laboratory Blanks/Equipment Blanks

Method Blank

Negative drift for hexavalent chromium was detected in the continuing calibration blanks (CCBs) and the method blank, at comparable amounts, impacting the aqueous equipment blank in this SDG. The nondetect hexavalent chromium result for the equipment blank FS-FB20140206 was qualified as estimated (UJ).

The method blank associated with the initial analysis of the soil samples in this data set contained hexavalent chromium at a concentration above the method detection limit (MDL), but below the reporting limit (RL) (refer to the nonconformance tables in Attachment B). Hexavalent chromium was detected in sample FS13-2.0-2.5 at a concentration less than three times the method blank concentration; therefore, the hexavalent chromium result in this sample was negated (U) at the detected value.

Since the hexavalent chromium results for the remaining soil samples reported from the initial analysis were detected at concentrations greater than ten times the amount found in the method blank, qualifications were not required.

MS Results

Sample FS13-0.0-0.5 was selected for the soil matrix spike analysis and used for supporting data quality recommendations. The soluble and insoluble matrix spike (MS) recoveries from the initial batch were 20.5% and 101.4%, respectively. The soluble MS recovery did not meet quality control (QC) criteria of 75-125%R. The post digestion spike (PDS) recovery was 99%, which met the PDS criteria of 85-115%.

Based on poor MS recoveries, less than 75%R, the MS and associated samples were reanalyzed using Method 7196. The soluble and insoluble matrix spike recoveries from the re-analysis were 67.8% and 99.0% respectively. The soluble MS recovery did not meet the QC criteria of 75-125%R. The PDS for the re-analysis batch was recovered at 89.7%, which met the PDS criteria of 85-115%.

Since the soluble MS recoveries were outside the acceptable QC limit of 75-125%, additional parameters were analyzed to determine if possible matrix interferences could be the cause for the poor matrix spike recoveries. All the soil samples were tested for pH and oxidation reduction potential (ORP) and plotted on an Eh/pH phase diagram chart. From this chart, the source sample for the matrix spike analysis was plotted below the phase change line, indicating reducing potential within the sample matrix, incapable of supporting hexavalent chromium. Analyses for ferrous iron, sulfide screen, and total organic carbon (TOC) were performed on the MS source sample to confirm the oxidizing/reducing potential within the sample matrix. The sulfide screen was reported as nondetect, indicating no reducing agents within the sample matrix; however, the ferrous iron (1.6%) and the TOC (72,100 mg/kg) results were positive, indicating potential reducing agents within the sample matrix.

Since the MS recoveries from both the initial and reanalysis did not meet the MS QC requirements, but at least one MS recovery was greater than 50%, the highest detected hexavalent chromium result was reported for each soil sample. The reported hexavalent chromium results in all the soil samples in this SDG were qualified as estimated (J) due to the poor MS recoveries.

Sample Results

Reported results (flagged B by the laboratory) that were less than the reporting limit (RL), but greater than or equal to the method detection limit (MDL) are approximate values and have been qualified as estimated (J).

The hexavalent chromium results in sample FS13-0.0-0.5 were significantly different between the initial analysis and reanalysis. As indicated above, the highest detected hexavalent chromium result was reported for each soil sample.

Metals**Laboratory Blanks/Equipment Blanks****Method Blank**

Chromium was detected in the method blank (MP77638-MB1) associated with all soil samples in this SDG, at a concentration above the MDL, but below the RL. Since the results for chromium in the associated soil samples were greater than ten times the amount detected in the method blank, no qualifications were required.

Data Quality and Usability

In general, these data appear to be valid and may be used for decision-making purposes. No data were rejected. Qualified results, if applicable, are presented in Attachments A and B.

The hexavalent chromium soil results in this SDG are usable as estimated values with the potential for low bias due to low soluble MS recovery, and since the MS sample matrix appears to be reducing based on the Eh-pH plot and the presence of TOC and ferrous iron. The highest detected hexavalent chromium result was reported for each soil sample.

The result for hexavalent chromium in the equipment blank is usable as an estimated nondetect result with potential low bias based negative instrument drift.

The negated hexavalent chromium result in soil sample FS13-2.0-2.5 is usable as a nondetect result.

Sample results reported between the MDL and RL, and or qualified due to high percent moisture content are usable as estimated values with an unknown directional bias.

ATTACHMENTS

Attachment A: Target Analyte Summary Hitlist(s)

Attachment B: Data Validation Report Form

Attachment A

Target Analyte Summary Hitlist(s)

Soil Target Analyte Summary Hit List (Hexavalent Chromium)

Site Name PPG Garfield Avenue Supplemental Remedial Investigation (GARIS) Forrest Street
Sampling Date February 6, 2014
Lab Name/ID Accutest, Dayton, NJ
SDG No JB59311 and JB59311R
Sample Matrix Soil
Trip Blank ID NA
Field Blank ID FS-FB20140206

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
FS13-0.0-0.5	JB59311-1	CHROMIUM (HEXAVALENT)	0.089	21.9	21.9	0.48	Qualify	18
FS13-2.0-2.5	JB59311-2	CHROMIUM (HEXAVALENT)	0.089	0.22	0.22	0.48	Qualify	18,31
FS13-2.0-2.5X	JB59311-3R	CHROMIUM (HEXAVALENT)	0.089	0.27B	0.27	0.47	Qualify	18,31
FS13-4.0-4.5	JB59311-4R	CHROMIUM (HEXAVALENT)	0.089	0.17B	0.17	0.52	Qualify	18,31

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

NJDEP Laboratory Footnote

1. The value reported is less than or equal to 3x the value in the preparation/reagent blank. It is the policy of NJDEP-DPFSSR to negate the reported value due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
2. The value reported is greater than three (3) times but less than ten (10) times the value in the preparation/reagent blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to the preparation/reagent blank contamination. The "B" qualifier alerts the end-user to the presence of this analyte in the preparation/reagent blank.
3. The value reported is less than or equal to three (3) times the value in the trip/field blank. It is the policy of NJDEP-DPFSSR to negate the reported value as due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
4. The value reported is greater than three (3) times but less than ten (10) times the value in the trip/field blanks and is considered "real". However, the reported value must be quantitatively qualified "J" due to trip/field blank contamination.

5. The concentration reported by the laboratory is incorrectly calculated.
6. The laboratory failed to report the presence of the analyte in the sample.
7. The reported Hexavalent Chromium value was qualified because the Calibration Check Standard was not within the recovery range (90-110 percent).
8. In the Duplicate Sample Analysis, Hexavalent Chromium fell outside the control limits of ≤ 20 percent for sample results $> 4xRL$ or $+ RL$ for sample results $< 4xRL$. Therefore, the result was qualified.
9. This analyte was rejected because the laboratory performed the Duplicate Analysis on a field blank.
10. The reported value was qualified because the PVS recovery was greater than 115 percent.
11. The reported value was qualified because the PVS recovery was less than 85 percent.
12. The non-detected value was qualified (UJ) because the PVS recovery was less than 85 percent. The possibility of a false negative exists.
13. The reported analyte was qualified because the associated Calibration Blank result was greater than the MDL.
14. The laboratory made a transcription error. No hits were found in the raw data.
15. This analyte is qualified or rejected because the laboratory exceeded the holding time for digestion and/or analysis.
16. The laboratory subtracted the preparation/reagent blank from the sample result. The Reviewer's calculation puts the preparation/reagent blank back into the result.
17. The photocopy is unreadable. Therefore, the QA reviewer cannot read the laboratory's reported concentration result.
18. The reported value was qualified because the predigestion spike recovery was less than 75 %, but greater than 50%.
19. The reported value was qualified because the predigestion spike recovery was greater than 125 percent.
20. The non-detected value was qualified (UJ) because the redigestion spike recovery was less than 75 percent. The possibility of a false negative exists.

21. The reported result was qualified or rejected because the laboratory did not record the pH value(s) of the sample in a laboratory notebook.
22. The reported value was qualified (J/UJ) because the sample moisture content exceeded 50 percent.
23. The sample result was rejected because the soluble and insoluble matrix spike recoveries were less than 50%.
24. The detected sample result was qualified (J) because the incorrect spike concentration was used.
25. The reported sample results were rejected because the predigestion spike recovery was greater than 150 percent.
26. The reported sample results were rejected because the redigestion spike recovery was greater than 150 percent.
27. The reported value was qualified (J) because the redigestion spike recovery was less than 75 percent.
28. The reported value was qualified (J/UJ) because the sample digestion temperature was less than 90C.
29. In the Field Duplicate Sample Analysis, Hexavalent Chromium fell outside the control limits of $\leq 20\%$ for sample results $> 4xRL$ or $+ RL$ for sample results $< 4xRL$. Therefore, the result was qualified.
30. The reported value was qualified as estimated (J/UJ) but the bias is uncertain due to both high and low MS recoveries.
31. The reported result was greater than the MDL but less than the RL and qualified (J) as estimated by the laboratory.
32. The reported value was qualified because the sample replicate precision criterion of $\leq 20\%$ for method 7199 was exceeded.
33. The reported value was qualified (J/UJ) because the laboratory control sample (LCS) recovery was less than 80%.
34. The reported value was qualified (J) because the laboratory control sample (LCS) recovery was greater than 120%.
35. The reported result was qualified because the matrix spike analysis was not performed at the proper frequency.
36. The reported result was qualified because the laboratory duplicate analysis was not performed at the proper frequency.
37. The result was qualified because the cooler temperature upon sample receipt exceeded 6C.

38. The reported value was qualified because the redigestion spike recovery was greater than 125 percent.
39. The reported result was rejected because the laboratory failed to perform the reanalysis due to insufficient sample volume.
40. The reported results was qualified because the laboratory failed to analyze an ending CCB.
41. The reported result was qualified because the laboratory failed to make the proper method specific pH adjustment.
42. The reported result was rejected because the laboratory failed to reanalyze the MS and associated sample(s) due to failed MS recoveries.
43. The result was qualified because of negative instrument drift.

Aqueous Target Analyte Summary Hit List (Hexavalent Chromium)

Site Name PPG Garfield Avenue Supplemental Remedial Investigation (GARIS) Forrest Street
Sampling Date February 6, 2014
Lab Name/ID Accutest, Dayton, NJ
SDG No JB59311 and JB59311R
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID FS-FB20140206

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/L)	Laboratory Sample Result (mg/L)	Validation Sample Result (mg/L)	RL (mg/L)	Quality Assurance Decision	NJDEP Validation Footnote
FS-FB20140206	JB59311-5	CHROMIUM (HEXAVALENT)	-0.004	U	U	0.010	Qualify	43

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

NJDEP Laboratory Footnote

1. The value reported is less than or equal to 3x the value in the preparation/reagent blank. It is the policy of NJDEP-DPFSR to negate the reported value due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
2. The value reported is greater than three (3) times but less than ten (10) times the value in the preparation/reagent blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to the preparation/reagent blank contamination. The "B" qualifier alerts the end-user to the presence of this analyte in the preparation/reagent blank.
3. The value reported is less than or equal to three (3) times the value in the trip/field blank. It is the policy of NJDEP-DPFSR to negate the reported value as due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
4. The value reported is greater than three (3) times but less than ten (10) times the value in the trip/field blanks and is considered "real". However, the reported value must be quantitatively qualified "J" due to trip/field blank contamination.
5. The concentration reported by the laboratory is incorrectly calculated.

6. The laboratory failed to report the presence of the analyte in the sample.
7. The reported Hexavalent Chromium value was qualified because the Calibration Check Standard was not within the recovery range (90-110 percent).
8. In the Duplicate Sample Analysis, Hexavalent Chromium fell outside the control limits of ≤ 20 percent for sample results $> 4xRL$ or $+ RL$ for sample results $< 4xRL$. Therefore, the result was qualified.
9. This analyte was rejected because the laboratory performed the Duplicate Analysis on a field blank.
10. The reported value was qualified because the PVS recovery was greater than 115 percent.
11. The reported value was qualified because the PVS recovery was less than 85 percent.
12. The non-detected value was qualified (UJ) because the PVS recovery was less than 85 percent. The possibility of a false negative exists.
13. The reported analyte was qualified because the associated Calibration Blank result was greater than the MDL.
14. The laboratory made a transcription error. No hits were found in the raw data.
15. This analyte is qualified or rejected because the laboratory exceeded the holding time for digestion and/or analysis.
16. The laboratory subtracted the preparation/reagent blank from the sample result. The Reviewer's calculation puts the preparation/reagent blank back into the result.
17. The photocopy is unreadable. Therefore, the QA reviewer cannot read the laboratory's reported concentration result.
18. The reported value was qualified because the predigestion spike recovery was less than 75 %, but greater than 50%.
19. The reported value was qualified because the predigestion spike recovery was greater than 125 percent.
20. The non-detected value was qualified (UJ) because the redigestion spike recovery was less than 75 percent. The possibility of a false negative exists.
21. The reported result was qualified or rejected because the laboratory did not record the pH value(s) of the sample in a laboratory notebook.

22. The reported value was qualified (J/UJ) because the sample moisture content exceeded 50 percent.
23. The sample result was rejected because the soluble and insoluble matrix spike recoveries were less than 50%.
24. The detected sample result was qualified (J) because the incorrect spike concentration was used.
25. The reported sample results were rejected because the predigestion spike recovery was greater than 150 percent.
26. The reported sample results were rejected because the redigestion spike recovery was greater than 150 percent.
27. The reported value was qualified (J) because the redigestion spike recovery was less than 75 percent.
28. The reported value was qualified (J/UJ) because the sample digestion temperature was less than 90C.
29. In the Field Duplicate Sample Analysis, Hexavalent Chromium fell outside the control limits of $\leq 20\%$ for sample results $> 4xRL$ or $+ RL$ for sample results $< 4xRL$. Therefore, the result was qualified.
30. The reported value was qualified as estimated (J/UJ) but the bias is uncertain due to both high and low MS recoveries.
31. The reported result was greater than the MDL but less than the RL and qualified (J) as estimated by the laboratory.
32. The reported value was qualified because the sample replicate precision criterion of $\leq 20\%$ for method 7199 was exceeded.
33. The reported value was qualified (J/UJ) because the laboratory control sample (LCS) recovery was less than 80%.
34. The reported value was qualified (J) because the laboratory control sample (LCS) recovery was greater than 120%.
35. The reported result was qualified because the matrix spike analysis was not performed at the proper frequency.
36. The reported result was qualified because the laboratory duplicate analysis was not performed at the proper frequency.
37. The result was qualified because the cooler temperature upon sample receipt exceeded 6C.
38. The reported value was qualified because the redigestion spike recovery was greater than 125 percent.

39. The reported result was rejected because the laboratory failed to perform the reanalysis due to insufficient sample volume.
40. The reported results was qualified because the laboratory failed to analyze an ending CCB.
41. The reported result was qualified because the laboratory failed to make the proper method specific pH adjustment.
42. The reported result was rejected because the laboratory failed to reanalyze the MS and associated sample(s) due to failed MS recoveries.
43. The result was qualified because of negative instrument drift.

Soil Target Analyte Summary Hit List (Metals)

Site Name PPG Garfield Avenue Supplemental Remedial Investigation (GARIS) Forrest Street
Sampling Date February 6, 2014
Lab Name/ID Accutest, Dayton, NJ
SDG No JB59311
Sample Matrix Soil
Trip Blank ID NA
Field Blank ID FS-FB20140206

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
FS13-0.0-0.5	JB59311-1	CHROMIUM	0.14	48.6	48.6	1.2		
FS13-0.0-0.5	JB59311-1	NICKEL	U	22.8	22.8	4.6		
FS13-0.0-0.5	JB59311-1	VANADIUM	U	32.4	32.4	5.8		
FS13-2.0-2.5	JB59311-2	ANTIMONY	U	3.3	3.3	2.3		
FS13-2.0-2.5	JB59311-2	CHROMIUM	0.14	121	121	1.2		
FS13-2.0-2.5	JB59311-2	NICKEL	U	12.3	12.3	4.6		
FS13-2.0-2.5	JB59311-2	VANADIUM	U	32.1	32.1	5.8		
FS13-2.0-2.5X	JB59311-3	ANTIMONY	U	2.5	2.5	2.4		
FS13-2.0-2.5X	JB59311-3	CHROMIUM	0.14	93.0	93.0	1.2		
FS13-2.0-2.5X	JB59311-3	NICKEL	U	11.5	11.5	4.9		
FS13-2.0-2.5X	JB59311-3	VANADIUM	U	25.2	25.2	6.1		
FS13-4.0-4.5	JB59311-4	CHROMIUM	0.14	16.0	16.0	1.3		
FS13-4.0-4.5	JB59311-4	NICKEL	U	43.7	43.7	5.3		
FS13-4.0-4.5	JB59311-4	VANADIUM	U	26.0	26.0	6.7		

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

NJDEP Laboratory Footnote

1. The value reported is less than or equal to 3x the value in the method blank. It is the policy of NJDEP-DPFSR to negate the reported value due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
2. The value reported is greater than three (3) but less than ten (10) times the value in the method blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to the method blank contamination. The "B" qualifier alerts the end-user to the presence of this analyte in the method blank.
3. The value reported is less than or equal to 3x the value in the trip/field blank. It is the policy of NJDEP-DPFSR to negate the reported value as due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
4. The value reported is greater than 3x but less than ten (10) the value in the trip/field blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to trip/field blank contamination.
5. The concentration reported by the laboratory is incorrectly calculated.
6. The laboratory failed to report the presence of the analyte in the sample.
7. The reported metal value was qualified because the Calibration Verification Standard was not within the recovery range (90-110 percent).
8. In the MS/MSD Sample Analysis, this analyte fell outside the control limits of 20% RPD. Therefore, the result was qualified.
9. This analyte was qualified because the laboratory performed the MS/MSD Analysis on a field blank.
10. The reported analyte was qualified because the associated Calibration Blank result was greater than the MDL.
11. The reported value was qualified because serial dilution analysis was not within QC limit of 10% D.
12. This analyte is rejected because the laboratory exceeded the holding time for digestion and analysis.
13. The laboratory subtracted the method blank from the sample result. The reviewer's calculation has added the method blank result to the reported concentration.

14. The photocopy submitted is illegible. Therefore, the QA reviewer cannot read the laboratory's reported concentration result.
15. The reported or nondetected value was qualified because the MS/MSD spike recovery was less than 75 percent.
16. The reported value was qualified because the MS/MSD spike recovery was greater than 125 percent.
17. The reported value was qualified as estimated (J/UJ) but the bias is uncertain due to both high and low MS recoveries.
18. The reported values were qualified because the laboratory duplicate exceeded 35 percent RPD for results greater than 5X the reporting limit or the absolute difference exceeded two times the reporting limit for sample result less than 5 times the reporting limit.
19. The reported value was qualified because the field duplicate exceeded 35 percent RPD for results greater than 5X the reporting limit or the absolute difference exceeded two times the reporting limit for sample result less than 5 times the reporting limit.
20. The reported value was qualified because the LCS recovery was less than 80 percent.
21. The reported value was qualified because the sample moisture content was greater than 50 percent.
22. The reported value was rejected because the field duplicate absolute difference was greater than 4 times the RL or the RPD was greater than 120%.
23. The reported result was greater than the MDL but less than the RL and qualified (J) as estimated by the laboratory.
24. The field duplicate absolute difference exceeded two times the reporting limit for sample result less than 5 times the reporting limit.
25. The reported value was qualified because the LCS recovery was greater than 120 percent.

Attachment B

Data Validation Report Form

Client Name: PPG Industries	Project Number: 60154801.6001A
Site Location: PPG Garfield Avenue Supplemental Remedial Investigation (GARIS) Forrest Street Soil, Jersey City, NJ	Project Manager: William Spronz
Laboratory: Accutest, Dayton, NJ	Type of Validation: Full
Laboratory Job No: JB59311 and JB59311R	Date Checked: 4/17/14
Validator: Paula DiMattei	Peer: Lisa Krowitz

ITEM	YES	NO	N/A	COMMENTS
Sample results included?	X			
Reporting Limits met project requirements?	X			
Field I.D. included?	X			
Laboratory I.D. included?	X			
Sample matrix included?	X			
Sample receipt temperature 2-6C?		X		Cooler temp. was 1.3°C. No actions required.
Signed COCs included?	X			
Date of sample collection included?	X			
Date of sample digestion included?	X			
Holding time to digestion met criteria? (Soils -30 days from collection to digestion.)	X			
Date of analysis included?	X			
Holding time to analysis met criteria? (Soils -168 hours from digestion to analysis; Aqueous - 24 hours from collection to analysis.)	X			
Method reference included?	X			
Laboratory Case Narrative included?	X			

Definitions: MDL Method Detection Limit; %R Percent Recovery; RL Reporting Limit; RPD Relative Percent Difference; RSD Relative Standard Deviation :Corr Correlation Coefficient.

ITEM	YES	NO	N/A	COMMENTS
Initial calibration documentation included in lab package?	X			
1) Blank plus 4 standards (7196A) or blank plus 3 standards (7199)	X			
2) Correlation coefficient of =0.995 (7196A) or =0.999 (7199)	X			
3) Calibrate daily or each time instrument is set up.	X			
Calibration Check Standard (CCS) for 7196A and Quality Control Sample (QCS) for 7199 Included in Lab Package?	X			
1) %R criteria met? (90 - 110%)	X			
2) Correct frequency of one per every 10 samples	X			
3) CCS and QCS from independent source and at mid-level of calibration curve	X			
Calibration Blanks	X			
1) Analyzed prior to initial calibration standards and after each CCS/QCS?	X			
2) Absolute value should not exceed MDL.		X		The CCB amount was comparable to the method blank amount; therefore, actions were based on the concentration detected in the method blank.
Method Blank, Field Blanks and/or Equipment Blanks Included in Lab Package?	X			FS-FB20140206
1) Method blank analyzed with each preparation batch?	X			
2) Absolute value should not exceed MDL.		X		See nonconformance table below.
Eh and pH Data	X			
1) Eh and pH data was included and plotted for all samples?	X			
Soluble Matrix Spike Data Included in Lab Package?	X			
1) Soluble Matrix %R criteria met? (75-125%R).		X		See nonconformance table below.
2) Was the spike concentration 40 mg/Kg or twice the sample concentration?	X			
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	X			
Insoluble Matrix Spike Data Included in Lab Package?	X			
1) Insoluble Matrix %R criteria met? (75-125%R).	X			
2) Was the spike concentration around 400 to 800 mg/Kg?		X		Spiked at 1010 mg/kg and 1120 mg/kg.
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	X			

ITEM	YES	NO	N/A	COMMENTS
Post Digestion Spike	X			
1) Post Digestion Spike %R criteria met? (85-115%R).	X			
2) Was the spike concentration 40 mg/Kg or twice the sample concentration?	X			
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	X			
Sample Duplicate Data Included in Lab Package?	X			FS13-0.0-0.5
1) RPD criteria met? (RPD ≤20%) if both results are ≤4x RL or absolute difference ≤RL if either or both results are <4xRL.	X			
2) Was a sample duplicate analyzed at the frequency of 1 per batch or 20 samples?	X			
Was a Laboratory Control Sample (LCS) Included in Lab Package?	X			
1) %R criteria met? (80-120%R).	X			
2) Was an LCS analyzed at the frequency of 1/batch or 20 samples?	X			
Were any Field Duplicate samples submitted with this SDG?	X			FS13-2.0-2.5 and FS13-2.0-2.5X
1) Were Field duplicate RPD criteria met? (RPD≤20% for both sample results >4xRL or absolute difference ≤ RL if either or both results are <4xRL.	X			
Were all sample quantitation and reporting requirements met?	X			
1) Were all solid samples reported with percent solids > 50% ?	X			
2) Were any samples analyzed or reported with dilutions?		X		
Miscellaneous Items	X			
1) For soils by 7196A, was the pH within a range of 7.0-8.0?	X			
2) For soils by 7199, was the pH within a range of 9.0-9.5?			X	
3) For aqueous by 7196A, was the pH with a range of 1.5-2.5?	X			
4) For soils (3060A), was the digestion temperature 90-95C for at least 60 minutes?	X			
5) For 7199, was each sample injected twice and was the RPD =20?			X	

Laboratory Blanks

Blank ID	Analyte	Result	QL	Units	Associated Samples
GN99053	CHROMIUM (HEXAVALENT)	-0.004	0.010	mg/L	FS-FB20140206
GP77704	CHROMIUM (HEXAVALENT)	0.089	0.010	mg/kg	All soil samples

Matrix Spikes

Sample ID	Analyte	Analysis Batch	Matrix Spike	% Recovery	Lower Limit	Upper Limit	PDS	PDS Limit
FS13-0.0-0.5	CHROMIUM (HEXAVALENT)	GP77704/GN99286	Soluble	20.5	75	125	99	85-115
FS13-0.0-0.5	CHROMIUM (HEXAVALENT)	GP77704/GN99286	Insoluble	101.4	75	125		
FS13-0.0-0.5	CHROMIUM (HEXAVALENT)	GP77926/GN99654	Soluble	67.8	75	125	89.7	85-115
FS13-0.0-0.5	CHROMIUM (HEXAVALENT)	GP77926/GN99654	Insoluble	99.0	75	125		

SDG#: JB59311
Batch: GN99286
 Cr+6 ICAL 02/11/14
 Soil
 (p. 316 of data pkg)

x - concentration	y - response
0	0
0.01	0.008
0.05	0.039
0.1	0.084
0.3	0.26
0.5	0.427
0.8	0.68
1	0.868

(p. 316 of data pkg)

AECOM Calculated Intercept	-0.0019	OK	Reported intercept	-0.0019
AECOM Slope	0.8628	OK	Reported Slope	0.8628
AECOM Calculated r	0.99991	OK	Reported r	0.99991

LCS calculation

GP77704-B1 p.316

Background Absorbance	0
Total absorbance	0.792
Total absorbance - background	0.792
Instrument Concentration	0.920
Sample weight (mg/kg)	0.0025
Final Volume (L)	0.1
Dilution Factor	1

AECOM Calculated LCS Result (mg/Kg)	36.8	OK	Reported Result (mg/Kg)	36.8
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%R = Found/True*100

p. 33

True Value (mg/kg)	40
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AECOM Calculated %R	92.0	OK	Reported %R	92.0
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MS calculation

JB59311-1 [FS13-0.0-0.5]p.316

Background reading	0
Total absorbance	0.382
Total absorbance - background	0.382
Instrument Concentration	0.4450
Sample weight (mg/kg)	0.00254
Final Volume (L)	0.1
Percent solids	0.831
Dilution Factor	50

AECOM Calculated MS Result (mg/Kg)	1050	OK	Reported Result (mg/Kg)	1050
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%R = Found/True*100

JB59311-1 [FS13-0.0-0.5] p.300

True Value (mg/kg)	1010
Native concentration (mg/Kg)	21.9

AECOM%R	102.2	OK rounding	Reported %R	101.4
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Percent Solids

JB59311-1 [FS13-0.0-0.5] p.301

Empty dish weight=	17.58
Wet weight=	23.96
Dry weight=	22.88

AECOM%solids =	83.1	OK	reported %solids=	83.1
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Reporting Limit**JB59311-1 [FS13-0.0-0.5] p.8**

Low Standard	0.01		
Initial weight (mg/kg)	0.0025		
Final volume (L)	0.1		
Percent solids	0.831		
Dilution Factor	1		
Reporting Limit	0.48	OK	Reported RL (mg/Kg)= 0.48

Sample Calculations**JB59311-1 [FS13-0.0-0.5] p.8, 316**

Background reading	0.014		
Total absorbance	0.404		
Total absorbance - background	0.39		
Instrument Response	0.454		
Sample weight (mg/kg)	0.0025		
Final Volume (L)	0.1		
Percent solids	0.831		
Dilution Factor	1		
AECOM Calculated Result (mg/Kg)	21.9	OK	Reported Result (mg/Kg) 21.9

Client Name: PPG Industries	Project Number: 60154801.6001A
Site Location: PPG Garfield Avenue Supplemental Remedial Investigation (GARIS) Forrest Street Soil, Jersey City, NJ	Project Manager: William Spronz
Laboratory: Accutest, Dayton, NJ	Type of Validation: Limited
Laboratory Job No: JB59311	Date Checked: 4/17/14
Validator: Paula DiMattei	Peer: Lisa Krowitz

ITEM	YES	NO	N/A	COMMENTS
Sample results included?	X			
Reporting Limits met project requirements?	X			
Field I.D. included?	X			
Laboratory I.D. included?	X			
Sample matrix included?	X			
Sample receipt temperature 2-6C?		X		Cooler temp. was 1.3°C. No actions required.
Signed COCs included?	X			
Date of sample collection included?	X			
Date of sample digestion included?	X			
Date of analysis included?	X			
Holding time met QC criteria? (Metals -180 days from sample collection; Mercury - 28 days from sample collection. If HT exceeded by 10 days R all results.	X			
Method reference included?	X			
Laboratory Case Narrative included?	X			

Definitions: MDL Method Detection Limit; %R Percent Recovery; RL Reporting Limit; RPD Relative Percent Difference; RSD Relative Standard Deviation ;Corr Correlation Coefficient.

ITEM	YES	NO	N/A	COMMENTS
Sample dilutions?		X		
Initial calibration documentation included in lab package?			X	NA for a Limited Review
1) Calibrate daily or each time instrument is set up.			X	
2) ICP (6010) -Blank plus 1 standard? If no, reject (R) data.			X	
3) Hg (7470/7471) -Blank plus 5 standards? If no, reject (R) data.			X	
Initial Calibration Verification Standard (ICV) for ICP (6010) and Initial Calibration Check Standard (ICCS) for Hg (7470/7471) included in lab package?			X	
1) Analyzed immediately after initial calibration? If no, reject (R) data.			X	
2) %R criteria met? (90-110%). If no, J positive results for affected analyte(s) if %R between 80-89% and 111-120% and indicate bias; UJ non-detect results for affected analyte(s) if %R between 80-89% , and R all data for affected analyte(s) if %R 120%.			X	
3) Spot check ICV/ICCS results for several analytes.			X	
Continuing Calibration Verification Standard (CCV) for ICP (6010) and Calibration Check Standard (CCS) for Hg (7470/7471) included in Lab Package?			X	
1) Analyzed immediately after each ICV/ICC/CB and after every 10 samples? If no, reject (R) data.			X	
2) CCS and CCV from independent source and at mid-level of calibration curve. If no, reject (R) data.			X	
3) %R criteria met? (90-110%R). If no, J positive results for affected analyte(s) if %R between 80-89% and 111-120% and indicate bias; UJ non-detect results for affected analyte(s) if %R between 80-89% and R all data for affected analyte(s) if %R 120%.			X	
4) Spot check CCV/CCS results for several analytes.			X	
Low Calibration Standard (CRI) included in Lab Package?			X	
1) %R criteria met? - 50-150% for Co, Mn, Zn, by ICP-MS; Pb, Tl by 6010; 70-130% all others. If no, refer to ILM05.4 NJ SOP 5.A.2 for actions.			X	

ITEM	YES	NO	N/A	COMMENTS
Calibration Blanks			X	NA for a Limited Review
1) Analyzed after daily calibration and after each ICV/ICC/CCV/CCS and after every 10 samples? If no, reject (R) data.			X	
2) Absolute value 10xCB result, no qualification.			X	
Method Blank Included in Lab Package?	X			
1) Method blank analyzed with each preparation batch or every SDG, or 1/20 samples? If no, reject (R) data, except no aqueous MB required for FB/EB if only soil samples were analyzed.	X			
2) Method blank analyzed 1/20 samples? If - MB 1/25, J sample results from 21-25; -MB >1/25, R sample results after 25th sample.	X			
3) MB results nondetect? If no, -sample result 3xMB but 10xMB, no qualification.		X		See nonconformance table below.
4) Negative MB result reported? If yes, -Positive sample result		X		
Field Blanks/Equipment Blanks Included in Lab Package?	X			FS-FB20140206
1) FB/EB result non-detect? If no, -sample result 3xFB/EB but 10xFB/EB, no qualification.	X			
ICP Interference Check Sample (ICS) included in Lab Package?			X	NA for a Limited Review
1) Analyzed at beginning of analytical run? If no, reject (R) data.			X	
2) %R criteria met? (80-120%) If no, %R>120%, no qualification if sample result non-detect; %R between 121-150%, J positive results, biased high; %R between 50-79%, J/UJ results, biased low; %R150%, reject (R) result			X	
3) Spot check accuracy of %Rs			X	
Matrix Spike/Matrix Spike Duplicate Data Included in Lab Package?	X			Batch QC was not assessed.
1) MS/MSD %R (75-125%R) and RPD (+20%) criteria met? - %R>125% J positive results for affected analyte(s) for all samples in the same batch/SDG, accept NDs; -%R			X	
2) Was a sample spiked at the frequency of 1/batch or 20 samples?			X	
3) Was the MS performed on a site sample?		X		
4) Was the MS performed on a FB/EB or TB? If yes, J all sample data.			X	

ITEM	YES	NO	N/A	COMMENTS
Post Digestion Spike			X	NA for a Limited review
1) %R criteria met? (75-125%R) - %R>125% J positive results for affected analyte(s) for all samples in the same batch/SDG, accept NDs.; - %R			X	
2) Was the spike performed on a FB/EB or TB? If yes, J all sample data.			X	
3) Was a sample spiked at the frequency of 1/batch or 20 samples?			X	
Laboratory Duplicate Data Included in Lab Package?			X	An MS/MSD was performed in lieu of a laboratory duplicate.
Aqueous - If RPD is >20% but 5x the QL, estimate (J) results >the QL. - If RPD is >100%, reject R results >/= the QL.- If sample and/or duplicate is the QL, estimate (J) positive results 2x the QL, reject R non-detects and positive results			X	
Soil - If RPD is >35% but 5x the QL, estimate (J) results > the QL. - If RPD is >120%, reject results > the QL. - If sample and/or duplicate is 2x the QL, estimate (J) positive results 4x the QL, reject nondetects and positive results			X	
Was a Laboratory Control Sample (LCS) Included in Lab Package?	X			
1) LCS %R criteria met? (80-120%R). If no, J/UJ all affected analytes(s) for all samples in the same batch/SDG.	X			
2) Was an LCS analyzed at the frequency of 1/batch or 20 samples? If no, J/UJ affected analyte(s) for all samples in the same batch/SDG.	X			
Serial Dilution			X	NA for a Limited review
1) %D(25xIDL (7000) or >10xIDL (6010) and %D >10% J positive results for affected analyte(s) for all samples in the same batch/SDG, accept NDs.			X	
2) Was the frequency 1/batch or 20 samples?			X	
3) Was a site sample used?			X	
4) Was a FB/EB or TB used? If yes, J all sample data.			X	
5) Spot check accuracy of %Ds.			X	

ITEM	YES	NO	N/A	COMMENTS
Field Duplicate Data included in Lab Package?	X			FS13-2.0-2.5 and FS13-2.0-2.5X
Aqueous - If RPD is >20% but 5x the QL, estimate (J) results > the QL. - If RPD is >100%, reject R results >= the QL. - If sample and/or duplicate is the QL, estimate (J) positive results 2x the QL, reject R non-detects and positive results			X	
Soil - If RPD is >35% but 5x the QL, estimate (J) results > the QL. - If RPD is >120%, reject results > the QL. - If sample and/or duplicate is 2x the QL, estimate (J) positive results 4x the QL, reject nondetects and positive results	X			
Percent Solids data included in Lab Package?	X			
1) %Solids criteria (Reg 2 criteria) met? (>=50%)	X			

Laboratory Blanks

Blank ID	Analyte	Result	QL	Units	Associated Samples
MP77638-MB1	Chromium	0.14	1.0	mg/kg	All soil samples

Data Validation Report

Project:	PPG Garfield Avenue Supplemental Remedial Investigation (GARIS) Forrest Street Groundwater and Soil	
Laboratory:	Accutest, Dayton, NJ	
Laboratory Job No.:	JB59425 and JB59425A	
Analysis/Method:	Hexavalent Chromium SW846 3060A/7196 Metals by ICP-AES/ SW846-6010	
Validation Level:	Full (Hexavalent Chromium) Limited (Metals)	
Site Location/Address:	Forrest Street, Jersey City, NJ	
AECOM Project No:	60154801.6001A	
Prepared by:	Paula DiMattei /AECOM	Completed on: 04/14/2014
Reviewed by:	Lisa Krowitz /AECOM	File Name: JB59425_A_2014-04-14_DV Report-F

Introduction

The data were reviewed in accordance with the FSP-QAPP and the following NJDEP validation Standard Operating Procedures (SOP):

- NJDEP Office of Data Quality SOP 5.A.10, Rev 3 (September 2009), SOP for Analytical Data Validation of Hexavalent Chromium - for USEPA SW-846 Method 3060A, USEPA SW-846 Method 7196A and USEPA SW-846 Method 7199;
- NJDEP Office of Data Quality SOP 5.A.16, Rev 1 (May 2002), Quality Assurance Data Validation of Analytical Deliverables for Inorganics (based on USEPA SW-846 Methods)

The results of quality control data analyzed with site samples were used to assess the overall reliability of the data. The following qualifiers were used to identify data quality issues:

- U: Indicates the analyte was not detected in the sample above the sample reporting limit.
- J: Indicates the result was an estimated value; the associated numerical value was an approximate concentration of the analyte in the sample.
- UJ: Indicates the analyte was not detected above the reporting limit and the reporting limit was approximate.
- R: The sample result was rejected due to serious deficiencies; the presence or absence of the analyte could not be confirmed.
- RA: The sample result was rejected but is still considered usable.

Sample Information

The samples listed below were collected by AECOM on February 7, 2014 as part of the PPG Garfield Avenue Supplemental Remedial Investigation (GARIS) - Forrest Street Groundwater and Soil sampling at the PPG Forrest Street site, Jersey City, NJ. Only the samples and parameters listed below were validated.

Field ID	Laboratory ID	Matrix	Fraction
FS13-10.0-10.5	JB59425-5	Soil	Hexavalent Chromium
FS13-10.0-10.5	JB59425-5A	Soil	Metals
FS13-12.0-12.5	JB59425-6	Soil	Hexavalent Chromium
FS13-12.0-12.5	JB59425-6A	Soil	Metals
FS13-14.0-14.5	JB59425-7	Soil	Hexavalent Chromium
FS13-14.0-14.5	JB59425-7A	Soil	Metals
FS13-16.0-16.5	JB59425-8	Soil	Hexavalent Chromium
FS13-16.0-16.5	JB59425-8A	Soil	Metals
FS13-18.0-18.5	JB59425-9	Soil	Hexavalent Chromium
FS13-18.0-18.5	JB59425-9A	Soil	Metals
FS13-6.0-6.5	JB59425-1	Soil	Hexavalent Chromium
FS13-6.0-6.5	JB59425-1A	Soil	Metals
FS13-8.0-8.5	JB59425-2	Soil	Hexavalent Chromium
FS13-8.0-8.5	JB59425-2A	Soil	Metals
FS13-8.0-8.5X (Field Duplicate of FS13-8.0-8.5)	JB59425-3	Soil	Hexavalent Chromium
FS13-8.0-8.5X (Field Duplicate of FS13-8.0-8.5)	JB59425-3A	Soil	Metals
FS13GW-10.0-14.0	JB59425-4	Ground Water	Hexavalent Chromium
FS13GW-10.0-14.0	JB59425-4A	Ground Water	Metals
FS13GW-20.0-24.0	JB59425-10	Ground Water	Hexavalent Chromium
FS13GW-20.0-24.0	JB59425-10A	Ground Water	Metals
FS-FB20140207 (Equipment Blank)	JB59425-11	Aqueous	Hexavalent Chromium
FS-FB20140207 (Equipment Blank)	JB59425-11A	Aqueous	Metals

The samples were collected following the procedures detailed in the Remedial Investigation Work Plan - Soil for Non-Residential Chromate Chemical Production Waste Sites 114, 132, 133, 135, 137, 143, and 186, Jersey City, New Jersey, or applicable proposal or work plan, and the Field Sampling Plan/Quality Assurance Project Plan for Non-Residential and Residential Chromium Sites Hudson County, New Jersey (December 2011).

General Comments

The data package was complete. Quality control (QC) issues identified during validation are discussed below. Refer to the Target Analyte Summary Hit(s) in Attachment A for a listing of all detected results, qualified results, and associated qualifications, where applicable. The nonconformances for each section discussed below are presented in Attachment B.

Hexavalent Chromium

Laboratory Blanks/Equipment Blanks

Negative drift for hexavalent chromium was detected in the continuing calibration blanks (CCBs) and the method blank, at comparable amounts, impacting all aqueous samples in this SDG. The positive and nondetect hexavalent chromium results for the equipment blank and groundwater samples were qualified as estimated (J/ UJ).

MS Results

Sample FS13-14.0-14.5 was selected for the matrix spike (MS) analysis associated with the soil samples in this SDG and was used for supporting data quality recommendations. The soluble and insoluble MS recoveries were 78.7% and 96.7, respectively; which met the quality control (QC) criteria of 75-125%. The post digestion spike (PDS) recovery was 94.3% which met the PDS criteria of 85-115%. No data qualification was required on the basis of spike recoveries.

Sample FS13GW-10.0-14.0 was selected for the MS analysis associated with the groundwater samples in this SDG. The MS recovery was 3.1%, which did not meet the QC recovery criteria of 85-115%. Additionally, the pH-adjusted PDS was 74%, which did not meet the PDS recovery criteria of 85-115%. Consequently, all groundwater samples were qualified as estimated (J/ UJ).

Sample Results

Reported results (flagged B by the laboratory) that were less than the reporting limit (RL), but greater than or equal to the method detection limit (MDL) are approximate values and have been qualified as estimated (J).

Metals

Laboratory Blanks/Equipment Blanks

Method Blank

Chromium and nickel were detected in the method blank (MP77655-MB1) associated with some of the soil samples in this SDG, at a concentration above the MDL, but below the RL. Since the results for chromium and nickel in the associated soil samples were greater than ten times the amount detected in the method blank, no qualifications were required.

Sample Results

Reported results (flagged B by the laboratory) that were less than the reporting limit (RL), but greater than or equal to the method detection limit (MDL) are approximate values that have been qualified as estimated (J).

Data Quality and Usability

In general, these data appear to be valid and may be used for decision-making purposes. No data were rejected. Qualified results, if applicable, are presented in Attachments A and B.

The hexavalent chromium results for the groundwater samples are usable as estimated values with potential low bias due to the low matrix spike recovery and negative instrument drift.

Soil sample results reported between the MDL and RL are usable as estimated values with an unknown directional bias.

ATTACHMENTS

Attachment A: Target Analyte Summary Hitlist(s)

Attachment B: Data Validation Report Form

Attachment A

Target Analyte Summary Hitlist(s)

Soil Target Analyte Summary Hit List (Hexavalent Chromium)

Site Name PPG Garfield Avenue Supplemental Remedial Investigation (GARIS) Forrest Street
Sampling Date February 7, 2014
Lab Name/ID Accutest, Dayton, NJ
SDG No JB59425
Sample Matrix Soil
Trip Blank ID NA
Field Blank ID FS-FB20140207

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
FS13-10.0-10.5	JB59425-5	CHROMIUM (HEXAVALENT)	U	0.73	0.73	0.49		
FS13-12.0-12.5	JB59425-6	CHROMIUM (HEXAVALENT)	U	0.33B	0.33	0.49	Qualify	31
FS13-14.0-14.5	JB59425-7	CHROMIUM (HEXAVALENT)	U	0.29B	0.29	0.46	Qualify	31
FS13-16.0-16.5	JB59425-8	CHROMIUM (HEXAVALENT)	U	0.16B	0.16	0.50	Qualify	31
FS13-18.0-18.5	JB59425-9	CHROMIUM (HEXAVALENT)	U	0.14B	0.14	0.46	Qualify	31
FS13-6.0-6.5	JB59425-1	CHROMIUM (HEXAVALENT)	U	0.56	0.56	0.55		
FS13-8.0-8.5	JB59425-2	CHROMIUM (HEXAVALENT)	U	0.44B	0.44	0.51	Qualify	31
FS13-8.0-8.5X	JB59425-3	CHROMIUM (HEXAVALENT)	U	0.87	0.87	0.50		

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

NJDEP Laboratory Footnote

1. The value reported is less than or equal to 3x the value in the preparation/reagent blank. It is the policy of NJDEP-DPFSR to negate the reported value due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.

2. The value reported is greater than three (3) times but less than ten (10) times the value in the preparation/reagent blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to the preparation/reagent blank contamination. The "B" qualifier alerts the end-user to the presence of this analyte in the preparation/reagent blank.

3. The value reported is less than or equal to three (3) times the value in the trip/field blank. It is the policy of NJDEP-DPFSSR to negate the reported value as due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
4. The value reported is greater than three (3) times but less than ten (10) times the value in the trip/field blanks and is considered "real". However, the reported value must be quantitatively qualified "J" due to trip/field blank contamination.
5. The concentration reported by the laboratory is incorrectly calculated.
6. The laboratory failed to report the presence of the analyte in the sample.
7. The reported Hexavalent Chromium value was qualified because the Calibration Check Standard was not within the recovery range (90-110 percent).
8. In the Duplicate Sample Analysis, Hexavalent Chromium fell outside the control limits of ≤ 20 percent for sample results $> 4xRL$ or $+ RL$ for sample results $< 4xRL$. Therefore, the result was qualified.
9. This analyte was rejected because the laboratory performed the Duplicate Analysis on a field blank.
10. The reported value was qualified because the PVS recovery was greater than 115 percent.
11. The reported value was qualified because the PVS recovery was less than 85 percent.
12. The non-detected value was qualified (UJ) because the PVS recovery was less than 85 percent. The possibility of a false negative exists.
13. The reported analyte was qualified because the associated Calibration Blank result was greater than the MDL.
14. The laboratory made a transcription error. No hits were found in the raw data.
15. This analyte is qualified or rejected because the laboratory exceeded the holding time for digestion and/or analysis.
16. The laboratory subtracted the preparation/reagent blank from the sample result. The Reviewer's calculation puts the preparation/reagent blank back into the result.
17. The photocopy is unreadable. Therefore, the QA reviewer cannot read the laboratory's reported concentration result.

18. The reported value was qualified because the predigestion spike recovery was less than 75 %, but greater than 50%.
19. The reported value was qualified because the predigestion spike recovery was greater than 125 percent.
20. The non-detected value was qualified (UJ) because the redigestion spike recovery was less than 75 percent. The possibility of a false negative exists.
21. The reported result was qualified or rejected because the laboratory did not record the pH value(s) of the sample in a laboratory notebook.
22. The reported value was qualified (J/UJ) because the sample moisture content exceeded 50 percent.
23. The sample result was rejected because the soluble and insoluble matrix spike recoveries were less than 50%.
24. The detected sample result was qualified (J) because the incorrect spike concentration was used.
25. The reported sample results were rejected because the predigestion spike recovery was greater than 150 percent.
26. The reported sample results were rejected because the redigestion spike recovery was greater than 150 percent.
27. The reported value was qualified (J) because the redigestion spike recovery was less than 75 percent.
28. The reported value was qualified (J/UJ) because the sample digestion temperature was less than 90C.
29. In the Field Duplicate Sample Analysis, Hexavalent Chromium fell outside the control limits of $\leq 20\%$ for sample results $> 4xRL$ or $+ RL$ for sample results $< 4xRL$. Therefore, the result was qualified.
30. The reported value was qualified as estimated (J/UJ) but the bias is uncertain due to both high and low MS recoveries.
31. The reported result was greater than the MDL but less than the RL and qualified (J) as estimated by the laboratory.
32. The reported value was qualified because the sample replicate precision criterion of $\leq 20\%$ for method 7199 was exceeded.
33. The reported value was qualified (J/UJ) because the laboratory control sample (LCS) recovery was less than 80%.

34. The reported value was qualified (J) because the laboratory control sample (LCS) recovery was greater than 120%.
35. The reported result was qualified because the matrix spike analysis was not performed at the proper frequency.
36. The reported result was qualified because the laboratory duplicate analysis was not performed at the proper frequency.
37. The result was qualified because the cooler temperature upon sample receipt exceeded 6C.
38. The reported value was qualified because the redigestion spike recovery was greater than 125 percent.
39. The reported result was rejected because the laboratory failed to perform the reanalysis due to insufficient sample volume.
40. The reported results was qualified because the laboratory failed to analyze an ending CCB.
41. The reported result was qualified because the laboratory failed to make the proper method specific pH adjustment.
42. The reported result was rejected because the laboratory failed to reanalyze the MS and associated sample(s) due to failed MS recoveries.
43. The result was qualified because of negative instrument drift.

Aqueous Target Analyte Summary Hit List (Hexavalent Chromium)

Site Name PPG Garfield Avenue Supplemental Remedial Investigation (GARIS) Forrest Street
Sampling Date February 7, 2014
Lab Name/ID Accutest, Dayton, NJ
SDG No JB59425
Sample Matrix Groundwater
Trip Blank ID NA
Field Blank ID NA

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/L)	Laboratory Sample Result (mg/L)	Validation Sample Result (mg/L)	RL (mg/L)	Quality Assurance Decision	NJDEP Validation Footnote
FS13GW-10.0-14.0	JB59425-4	CHROMIUM (HEXAVALENT)	-0.006	U	U	0.010	Qualify	11,43
FS13GW-20.0-24.0	JB59425-10	CHROMIUM (HEXAVALENT)	-0.006	0.022	0.022	0.010	Qualify	11,43
FS-FB20140207	JB59425-11	CHROMIUM (HEXAVALENT)	-0.006	U	U	0.010	Qualify	11,43

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

NJDEP Laboratory Footnote

1. The value reported is less than or equal to 3x the value in the preparation/reagent blank. It is the policy of NJDEP-DPFSR to negate the reported value due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
2. The value reported is greater than three (3) times but less than ten (10) times the value in the preparation/reagent blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to the preparation/reagent blank contamination. The "B" qualifier alerts the end-user to the presence of this analyte in the preparation/reagent blank.
3. The value reported is less than or equal to three (3) times the value in the trip/field blank. It is the policy of NJDEP-DPFSR to negate the reported value as due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
4. The value reported is greater than three (3) times but less than ten (10) times the value in the trip/field blanks and is considered "real". However,

the reported value must be quantitatively qualified "J" due to trip/field blank contamination.

5. The concentration reported by the laboratory is incorrectly calculated.

6. The laboratory failed to report the presence of the analyte in the sample.

7. The reported Hexavalent Chromium value was qualified because the Calibration Check Standard was not within the recovery range (90-110 percent).

8. In the Duplicate Sample Analysis, Hexavalent Chromium fell outside the control limits of ≤ 20 percent for sample results $> 4xRL$ or $+ RL$ for sample results $< 4xRL$. Therefore, the result was qualified.

9. This analyte was rejected because the laboratory performed the Duplicate Analysis on a field blank.

10. The reported value was qualified because the PVS recovery was greater than 115 percent.

11. The reported value was qualified because the PVS recovery was less than 85 percent.

12. The non-detected value was qualified (UJ) because the PVS recovery was less than 85 percent. The possibility of a false negative exists.

13. The reported analyte was qualified because the associated Calibration Blank result was greater than the MDL.

14. The laboratory made a transcription error. No hits were found in the raw data.

15. This analyte is qualified or rejected because the laboratory exceeded the holding time for digestion and/or analysis.

16. The laboratory subtracted the preparation/reagent blank from the sample result. The Reviewer's calculation puts the preparation/reagent blank back into the result.

17. The photocopy is unreadable. Therefore, the QA reviewer cannot read the laboratory's reported concentration result.

18. The reported value was qualified because the predigestion spike recovery was less than 75 %, but greater than 50%.

19. The reported value was qualified because the predigestion spike recovery was greater than 125 percent.
20. The non-detected value was qualified (UJ) because the redigestion spike recovery was less than 75 percent. The possibility of a false negative exists.
21. The reported result was qualified or rejected because the laboratory did not record the pH value(s) of the sample in a laboratory notebook.
22. The reported value was qualified (J/UJ) because the sample moisture content exceeded 50 percent.
23. The sample result was rejected because the soluble and insoluble matrix spike recoveries were less than 50%.
24. The detected sample result was qualified (J) because the incorrect spike concentration was used.
25. The reported sample results were rejected because the predigestion spike recovery was greater than 150 percent.
26. The reported sample results were rejected because the redigestion spike recovery was greater than 150 percent.
27. The reported value was qualified (J) because the redigestion spike recovery was less than 75 percent.
28. The reported value was qualified (J/UJ) because the sample digestion temperature was less than 90C.
29. In the Field Duplicate Sample Analysis, Hexavalent Chromium fell outside the control limits of $\leq 20\%$ for sample results $> 4xRL$ or $+ RL$ for sample results $< 4xRL$. Therefore, the result was qualified.
30. The reported value was qualified as estimated (J/UJ) but the bias is uncertain due to both high and low MS recoveries.
31. The reported result was greater than the MDL but less than the RL and qualified (J) as estimated by the laboratory.
32. The reported value was qualified because the sample replicate precision criterion of $\leq 20\%$ for method 7199 was exceeded.
33. The reported value was qualified (J/UJ) because the laboratory control sample (LCS) recovery was less than 80%.
34. The reported value was qualified (J) because the laboratory control sample (LCS) recovery was greater than 120%.

35. The reported result was qualified because the matrix spike analysis was not performed at the proper frequency.
36. The reported result was qualified because the laboratory duplicate analysis was not performed at the proper frequency.
37. The result was qualified because the cooler temperature upon sample receipt exceeded 6C.
38. The reported value was qualified because the redigestion spike recovery was greater than 125 percent.
39. The reported result was rejected because the laboratory failed to perform the reanalysis due to insufficient sample volume.
40. The reported results was qualified because the laboratory failed to analyze an ending CCB.
41. The reported result was qualified because the laboratory failed to make the proper method specific pH adjustment.
42. The reported result was rejected because the laboratory failed to reanalyze the MS and associated sample(s) due to failed MS recoveries.
43. The result was qualified because of negative instrument drift.

Soil Target Analyte Summary Hit List (Metals)

Site Name PPG Garfield Avenue Supplemental Remedial Investigation (GARIS) Forrest Street
Sampling Date February 7, 2014
Lab Name/ID Accutest, Dayton, NJ
SDG No JB59425A
Sample Matrix Soil
Trip Blank ID NA
Field Blank ID FS-FB20140207

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
FS13-10.0-10.5	JB59425-5A	ANTIMONY	U	1.2B	1.2	2.5	Qualify	23
FS13-10.0-10.5	JB59425-5A	CHROMIUM	0.32	24.3	24.3	1.3		
FS13-10.0-10.5	JB59425-5A	NICKEL	0.16	16.1	16.1	5.0		
FS13-10.0-10.5	JB59425-5A	VANADIUM	U	37.9	37.9	6.3		
FS13-12.0-12.5	JB59425-6A	ANTIMONY	U	0.73B	0.73	2.5	Qualify	23
FS13-12.0-12.5	JB59425-6A	CHROMIUM	0.32	18.7	18.7	1.3		
FS13-12.0-12.5	JB59425-6A	NICKEL	0.16	11.1	11.1	5.0		
FS13-12.0-12.5	JB59425-6A	VANADIUM	U	25.5	25.5	6.3		
FS13-14.0-14.5	JB59425-7A	ANTIMONY	U	0.79B	0.79	2.3	Qualify	23
FS13-14.0-14.5	JB59425-7A	CHROMIUM	0.32	17.1	17.1	1.2		
FS13-14.0-14.5	JB59425-7A	NICKEL	0.16	13.2	13.2	4.6		
FS13-14.0-14.5	JB59425-7A	VANADIUM	U	19.2	19.2	5.8		
FS13-16.0-16.5	JB59425-8A	ANTIMONY	U	0.64B	0.64	2.5	Qualify	23
FS13-16.0-16.5	JB59425-8A	CHROMIUM	0.32	13.4	13.4	1.3		
FS13-16.0-16.5	JB59425-8A	NICKEL	0.16	14.6	14.6	5.1		
FS13-16.0-16.5	JB59425-8A	VANADIUM	U	19.6	19.6	6.4		
FS13-18.0-18.5	JB59425-9A	ANTIMONY	U	0.83B	0.83	2.3	Qualify	23
FS13-18.0-18.5	JB59425-9A	CHROMIUM	0.32	10.1	10.1	1.2		

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
FS13-18.0-18.5	JB59425-9A	NICKEL	0.16	5.9	5.9	4.6		
FS13-18.0-18.5	JB59425-9A	VANADIUM	U	16.5	16.5	5.8		
FS13-6.0-6.5	JB59425-1A	ANTIMONY	U	1.2B	1.2	2.7	Qualify	23
FS13-6.0-6.5	JB59425-1A	CHROMIUM	0.32	15.5	15.5	1.4		
FS13-6.0-6.5	JB59425-1A	NICKEL	0.16	15.0	15.0	5.5		
FS13-6.0-6.5	JB59425-1A	VANADIUM	U	20.4	20.4	6.9		
FS13-8.0-8.5	JB59425-2A	ANTIMONY	U	0.56B	0.56	2.6	Qualify	23
FS13-8.0-8.5	JB59425-2A	CHROMIUM	0.32	19.7	19.7	1.3		
FS13-8.0-8.5	JB59425-2A	NICKEL	0.16	27.9	27.9	5.3		
FS13-8.0-8.5	JB59425-2A	VANADIUM	U	26.2	26.2	6.6		
FS13-8.0-8.5X	JB59425-3A	ANTIMONY	U	0.48B	0.48	2.5	Qualify	23
FS13-8.0-8.5X	JB59425-3A	CHROMIUM	0.32	16.1	16.1	1.2		
FS13-8.0-8.5X	JB59425-3A	NICKEL	0.16	26.5	26.5	4.9		
FS13-8.0-8.5X	JB59425-3A	VANADIUM	U	21.0	21.0	6.2		

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

NJDEP Laboratory Footnote

1. The value reported is less than or equal to 3x the value in the method blank. It is the policy of NJDEP-DPFSR to negate the reported value due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
2. The value reported is greater than three (3) but less than ten (10) times the value in the method blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to the method blank contamination. The "B" qualifier alerts the end-user to the presence of this analyte in the method blank.

3. The value reported is less than or equal to 3x the value in the trip/field blank. It is the policy of NJDEP-DPFSR to negate the reported value as due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
4. The value reported is greater than 3x but less than ten (10) the value in the trip/field blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to trip/field blank contamination.
5. The concentration reported by the laboratory is incorrectly calculated.
6. The laboratory failed to report the presence of the analyte in the sample.
7. The reported metal value was qualified because the Calibration Verification Standard was not within the recovery range (90-110 percent).
8. In the MS/MSD Sample Analysis, this analyte fell outside the control limits of 20% RPD. Therefore, the result was qualified.
9. This analyte was qualified because the laboratory performed the MS/MSD Analysis on a field blank.
10. The reported analyte was qualified because the associated Calibration Blank result was greater than the MDL.
11. The reported value was qualified because serial dilution analysis was not within QC limit of 10% D.
12. This analyte is rejected because the laboratory exceeded the holding time for digestion and analysis.
13. The laboratory subtracted the method blank from the sample result. The reviewer's calculation has added the method blank result to the reported concentration.
14. The photocopy submitted is illegible. Therefore, the QA reviewer cannot read the laboratory's reported concentration result.
15. The reported or nondetected value was qualified because the MS/MSD spike recovery was less than 75 percent.
16. The reported value was qualified because the MS/MSD spike recovery was greater than 125 percent.
17. The reported value was qualified as estimated (J/UJ) but the bias is uncertain due to both high and low MS recoveries.
18. The reported values were qualified because the laboratory duplicate exceeded 35 percent RPD for results greater than 5X the reporting limit or the absolute difference exceeded two times the reporting limit for sample result less than 5 times the reporting limit.

19. The reported value was qualified because the field duplicate exceeded 35 percent RPD for results greater than 5X the reporting limit or the absolute difference exceeded two times the reporting limit for sample result less than 5 times the reporting limit.
20. The reported value was qualified because the LCS recovery was less than 80 percent.
21. The reported value was qualified because the sample moisture content was greater than 50 percent.
22. The reported value was rejected because the field duplicate absolute difference was greater than 4 times the RL or the RPD was greater than 120%.
23. The reported result was greater than the MDL but less than the RL and qualified (J) as estimated by the laboratory.
24. The field duplicate absolute difference exceeded two times the reporting limit for sample result less than 5 times the reporting limit.
25. The reported value was qualified because the LCS recovery was greater than 120 percent.

Aqueous Target Analyte Summary Hit List (Metals)

Site Name PPG Garfield Avenue Supplemental Remedial Investigation (GARIS) Forrest Street
Sampling Date February 7, 2014
Lab Name/ID Accutest, Dayton, NJ
SDG No JB59425A
Sample Matrix Groundwater
Trip Blank ID NA
Field Blank ID NA

Field Sample ID	Lab Sample ID	Analyte	Method Blank (ug/L)	Laboratory Sample Result (ug/L)	Validation Sample Result (ug/L)	RL (ug/L)	Quality Assurance Decision	NJDEP Validation Footnote
FS13GW-10.0-14.0	JB59425-4A	CHROMIUM	U	290	290	10		
FS13GW-20.0-24.0	JB59425-10A	CHROMIUM	U	1830	1830	20		

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

NJDEP Laboratory Footnote

1. The value reported is less than or equal to 3x the value in the method blank. It is the policy of NJDEP-DPFSR to negate the reported value due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
2. The value reported is greater than three (3) but less than ten (10) times the value in the method blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to the method blank contamination. The "B" qualifier alerts the end-user to the presence of this analyte in the method blank.
3. The value reported is less than or equal to 3x the value in the trip/field blank. It is the policy of NJDEP-DPFSR to negate the reported value as due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
4. The value reported is greater than 3x but less than ten (10) the value in the trip/field blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to trip/field blank contamination.
5. The concentration reported by the laboratory is incorrectly calculated.

6. The laboratory failed to report the presence of the analyte in the sample.
7. The reported metal value was qualified because the Calibration Verification Standard was not within the recovery range (90-110 percent).
8. In the MS/MSD Sample Analysis, this analyte fell outside the control limits of 20% RPD. Therefore, the result was qualified.
9. This analyte was qualified because the laboratory performed the MS/MSD Analysis on a field blank.
10. The reported analyte was qualified because the associated Calibration Blank result was greater than the MDL.
11. The reported value was qualified because serial dilution analysis was not within QC limit of 10% D.
12. This analyte is rejected because the laboratory exceeded the holding time for digestion and analysis.
13. The laboratory subtracted the method blank from the sample result. The reviewer's calculation has added the method blank result to the reported concentration.
14. The photocopy submitted is illegible. Therefore, the QA reviewer cannot read the laboratory's reported concentration result.
15. The reported or nondetected value was qualified because the MS/MSD spike recovery was less than 75 percent.
16. The reported value was qualified because the MS/MSD spike recovery was greater than 125 percent.
17. The reported value was qualified as estimated (J/UJ) but the bias is uncertain due to both high and low MS recoveries.
18. The reported values were qualified because the laboratory duplicate exceeded 35 percent RPD for results greater than 5X the reporting limit or the absolute difference exceeded two times the reporting limit for sample result less than 5 times the reporting limit.
19. The reported value was qualified because the field duplicate exceeded 35 percent RPD for results greater than 5X the reporting limit or the absolute difference exceeded two times the reporting limit for sample result less than 5 times the reporting limit.
20. The reported value was qualified because the LCS recovery was less than 80 percent.
21. The reported value was qualified because the sample moisture content was greater than 50 percent.

22. The reported value was rejected because the field duplicate absolute difference was greater than 4 times the RL or the RPD was greater than 120%.
23. The reported result was greater than the MDL but less than the RL and qualified (J) as estimated by the laboratory.
24. The field duplicate absolute difference exceeded two times the reporting limit for sample result less than 5 times the reporting limit.
25. The reported value was qualified because the LCS recovery was greater than 120 percent.

Attachment B

Data Validation Report Form

Client Name: PPG Industries	Project Number: 60154801.6001A
Site Location: PPG Garfield Avenue Supplemental Remedial Investigation (GARIS) Forrest Street Groundwater and Soil, Jersey City, NJ	Project Manager: William Spronz
Laboratory: Accutest, Dayton, NJ	Type of Validation: Full
Laboratory Job No: JB59425	Date Checked: 4/14/14
Validator: Paula DiMattei	Peer: Lisa Krowitz

ITEM	YES	NO	N/A	COMMENTS
Sample results included?	X			
Reporting Limits met project requirements?	X			
Field I.D. included?	X			
Laboratory I.D. included?	X			
Sample matrix included?	X			
Sample receipt temperature 2-6C?		X		One cooler was 1°C; no actions required.
Signed COCs included?	X			
Date of sample collection included?	X			
Date of sample digestion included?	X			
Holding time to digestion met criteria? (Soils -30 days from collection to digestion.)	X			
Date of analysis included?	X			
Holding time to analysis met criteria? (Soils -168 hours from digestion to analysis; Aqueous - 24 hours from collection to analysis.)	X			
Method reference included?	X			
Laboratory Case Narrative included?	X			

Definitions: MDL Method Detection Limit; %R Percent Recovery; RL Reporting Limit; RPD Relative Percent Difference; RSD Relative Standard Deviation :Corr Correlation Coefficient.

ITEM	YES	NO	N/A	COMMENTS
Initial calibration documentation included in lab package?	X			
1) Blank plus 4 standards (7196A) or blank plus 3 standards (7199)	X			
2) Correlation coefficient of =0.995 (7196A) or =0.999 (7199)	X			
3) Calibrate daily or each time instrument is set up.	X			
Calibration Check Standard (CCS) for 7196A and Quality Control Sample (QCS) for 7199 Included in Lab Package?	X			
1) %R criteria met? (90 - 110%)	X			
2) Correct frequency of one per every 10 samples	X			
3) CCS and QCS from independent source and at mid-level of calibration curve	X			
Calibration Blanks	X			
1) Analyzed prior to initial calibration standards and after each CCS/QCS?	X			
2) Absolute value should not exceed MDL.		X		
Method Blank, Field Blanks and/or Equipment Blanks Included in Lab Package?	X			FS-FB20140207
1) Method blank analyzed with each preparation batch?	X			
2) Absolute value should not exceed MDL.	X			
Eh and pH Data	X			
1) Eh and pH data was included and plotted for all samples?	X			
Soluble Matrix Spike Data Included in Lab Package?	X			Soil MS: FS13-14.0-14.5. Aqueous MS: FS13GW-10.0-14.0
1) Soluble Matrix %R criteria met? (75-125%R).	X			
2) Was the spike concentration 40 mg/Kg or twice the sample concentration?	X			
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	X			
Insoluble Matrix Spike Data Included in Lab Package?	X			
1) Insoluble Matrix %R criteria met? (75-125%R).	X			
2) Was the spike concentration around 400 to 800 mg/Kg?		X		Spiked at 937 mg/kg. No impact to data.
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	X			

ITEM	YES	NO	N/A	COMMENTS
Post Digestion Spike	X			
1) Post Digestion Spike %R criteria met? (85-115%R).		X		Soil met criteria. Aqueous (see nonconformance table below)
2) Was the spike concentration 40 mg/Kg or twice the sample concentration?	X			
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	X			
Sample Duplicate Data Included in Lab Package?	X			Soil lab dup: FS-14.0-14.5 and Aqueous lab dup: FS13GW-10.0-14.0
1) RPD criteria met? (RPD ≤20%) if both results are ≤4x RL or absolute difference ≤RL if either or both results are <4xRL.	X			
2) Was a sample duplicate analyzed at the frequency of 1 per batch or 20 samples?	X			
Was a Laboratory Control Sample (LCS) Included in Lab Package?	X			
1) %R criteria met? (80-120%R).	X			
2) Was an LCS analyzed at the frequency of 1/batch or 20 samples?	X			
Were any Field Duplicate samples submitted with this SDG?	X			
1) Were Field duplicate RPD criteria met? (RPD≤20% for both sample results >4xRL or absolute difference ≤ RL if either or both results are <4xRL.	X			
Were all sample quantitation and reporting requirements met?				
1) Were all solid samples reported with percent solids > 50% ?	X			
2) Were any samples analyzed or reported with dilutions?				
Miscellaneous Items	X			
1) For soils by 7196A, was the pH within a range of 7.0-8.0?	X			
2) For soils by 7199, was the pH within a range of 9.0-9.5?			X	
3) For aqueous by 7196A, was the pH with a range of 1.5-2.5?	X			
4) For soils (3060A), was the digestion temperature 90-95C for at least 60 minutes?	X			
5) For 7199, was each sample injected twice and was the RPD =20?				

Laboratory Blanks

Blank ID	Analyte	Result	QL	Units	Associated Samples
GN99116-MB1	CHROMIUM (HEXAVALENT)	-0.006	0.010	mg/L	FS13GW-10.0-14.0 FS13GW-20.0-24.0 FS-FB20140207

Matrix Spikes

Sample ID	Analyte	Analysis Batch	MS % Recovery	pH-adjusted PDS % Recovery	Lower Limit	Upper Limit
FS13GW-10.0-14.0	CHROMIUM (HEXAVALENT)	GN99116	3.1	74	85	115

SDG#: JB59425
Batch: GN99409
 Cr+6 ICAL 02/13/14
 Soil
 (p. 58 of data pkg)

x - concentration	y - response
0	0
0.01	0.009
0.05	0.045
0.1	0.091
0.3	0.268
0.5	0.442
0.8	0.691
1	0.898

(p. 58 of data pkg)

AECOM Calculated Intercept	0.0003	OK	Reported intercept	0.0003
AECOM Slope	0.8847	OK	Reported Slope	0.8847
AECOM Calculated r	0.99971	OK	Reported r	0.99971

LCS calculation

GP77837-B1 pgs. 58

Background Absorbance	0
Total absorbance	0.847
Total absorbance - background	0.847
Instrument Concentration	0.957
Sample weight (mg/kg)	0.0025
Final Volume (L)	0.1
Dilution Factor	1

AECOM Calculated LCS Result (mg/Kg)	38.3	OK	Reported Result (mg/Kg)	38.3
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%R = Found/True*100

p. 33

True Value (mg/kg)	40
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AECOM Calculated %R	95.7	OK rounding	Reported %R	95.8
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MS calculation

JB59425-7 [FS13-14.0-14.5] pg. 58

Background reading	0
Total absorbance	0.339
Total absorbance - background	0.339
Instrument Concentration	0.3829
Sample weight (mg/kg)	0.00242
Final Volume (L)	0.1
Percent solids	0.873
Dilution Factor	50

AECOM Calculated MS Result (mg/Kg)	906	OK	Reported Result (mg/Kg)	906
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%R = Found/True*100

JB59425-7 [FS13-14.0-14.5] pg. 35

True Value (mg/kg)	937
Native concentration (mg/Kg)	0.29

AECOM %R	96.7	OK	Reported %R	96.7
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Percent Solids

JB59425-7 [FS13-14.0-14.5] pg. 36

Empty dish weight=	18.83
Wet weight=	28.25
Dry weight=	27.05

AECOM %solids =	87.3	OK	reported %solids=	87.3
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Reporting Limit**JB59425-7 [FS13-14.0-14.5] p.15**

Low Standard	0.01		
Initial weight (mg/kg)	0.00258		
Final volume (L)	0.1		
Percent solids	0.873		
Dilution Factor	1		
Reporting Limit	0.44	OK rounding	Reported RL (mg/Kg)= 0.46

Sample Calculations**JB59425-7 [FS13-14.0-14.5] p.15, 58**

Background reading	0		
Total absorbance	0.006		
Total absorbance - background	0.006		
Instrument Response	0.006		
Sample weight (mg/kg)	0.00258		
Final Volume (L)	0.1		
Percent solids	0.873		
Dilution Factor	1		
AECOM Calculated Result (mg/Kg)	0.29	OK	Reported Result (mg/Kg) 0.29

Client Name: PPG Industries	Project Number: 60154801.6001A
Site Location: PPG Garfield Avenue Supplemental Remedial Investigation (GARIS) Forrest Street Groundwater and Soil, Jersey City, NJ	Project Manager: William Spronz
Laboratory: Accutest, Dayton, NJ	Type of Validation: Limited
Laboratory Job No: JB59425A	Date Checked: 4/14/14
Validator: Paula DiMattei	Peer: Lisa Krowitz

ITEM	YES	NO	N/A	COMMENTS
Sample results included?	X			
Reporting Limits met project requirements?	X			
Field I.D. included?	X			
Laboratory I.D. included?	X			
Sample matrix included?	X			
Sample receipt temperature 2-6C?		X		One cooler was 1°C. No actions required
Signed COCs included?	X			
Date of sample collection included?	X			
Date of sample digestion included?	X			
Date of analysis included?	X			
Holding time met QC criteria? (Metals -180 days from sample collection; Mercury - 28 days from sample collection. If HT exceeded by 10 days R all results.	X			
Method reference included?	X			
Laboratory Case Narrative included?	X			

Definitions: MDL Method Detection Limit; %R Percent Recovery; RL Reporting Limit; RPD Relative Percent Difference; RSD Relative Standard Deviation ;Corr Correlation Coefficient.

ITEM	YES	NO	N/A	COMMENTS
Sample dilutions?	X			
Initial calibration documentation included in lab package?			X	NA to a Limited review
1) Calibrate daily or each time instrument is set up.			X	
2) ICP (6010) -Blank plus 1 standard? If no, reject (R) data.			X	
3) Hg (7470/7471) -Blank plus 5 standards? If no, reject (R) data.			X	
Initial Calibration Verification Standard (ICV) for ICP (6010) and Initial Calibration Check Standard (ICCS) for Hg (7470/7471) included in lab package?			X	
1) Analyzed immediately after initial calibration? If no, reject (R) data.			X	
2) %R criteria met? (90-110%). If no, J positive results for affected analyte(s) if %R between 80-89% and 111-120% and indicate bias; UJ non-detect results for affected analyte(s) if %R between 80-89% , and R all data for affected analyte(s) if %R 120%.			X	
3) Spot check ICV/ICCS results for several analytes.			X	
Continuing Calibration Verification Standard (CCV) for ICP (6010) and Calibration Check Standard (CCS) for Hg (7470/7471) included in Lab Package?			X	
1) Analyzed immediately after each ICV/ICC/CB and after every 10 samples? If no, reject (R) data.			X	
2) CCS and CCV from independent source and at mid-level of calibration curve. If no, reject (R) data.			X	
3) %R criteria met? (90-110%R). If no, J positive results for affected analyte(s) if %R between 80-89% and 111-120% and indicate bias; UJ non-detect results for affected analyte(s) if %R between 80-89% and R all data for affected analyte(s) if %R 120%.			X	
4) Spot check CCV/CCS results for several analytes.			X	
Low Calibration Standard (CRI) included in Lab Package?			X	
1) %R criteria met? - 50-150% for Co, Mn, Zn, by ICP-MS; Pb, Tl by 6010; 70-130% all others. If no, refer to ILM05.4 NJ SOP 5.A.2 for actions.			X	

ITEM	YES	NO	N/A	COMMENTS
Calibration Blanks			X	NA for a Limited Review
1) Analyzed after daily calibration and after each ICV/ICC/CCV/CCS and after every 10 samples? If no, reject (R) data.			X	
2) Absolute value 10xCB result, no qualification.			X	
Method Blank Included in Lab Package?	X			
1) Method blank analyzed with each preparation batch or every SDG, or 1/20 samples? If no, reject (R) data, except no aqueous MB required for FB/EB if only soil samples were analyzed.	X			
2) Method blank analyzed 1/20 samples? If - MB 1/25, J sample results from 21-25; -MB >1/25, R sample results after 25th sample.	X			
3) MB results nondetect? If no, -sample result 3xMB but 10xMB, no qualification.		X		See nonconformance table below
4) Negative MB result reported? If yes, -Positive sample result		X		
Field Blanks/Equipment Blanks Included in Lab Package?	X			FS-FB20140207
1) FB/EB result non-detect? If no, -sample result 3xFB/EB but 10xFB/EB, no qualification.	X			
ICP Interference Check Sample (ICS) included in Lab Package?			X	NA for a Limited Review
1) Analyzed at beginning of analytical run? If no, reject (R) data.			X	
2) %R criteria met? (80-120%) If no, %R>120%, no qualification if sample result non-detect; %R between 121-150%, J positive results, biased high; %R between 50-79%, J/UJ results, biased low; %R150%, reject (R) result			X	
3) Spot check accuracy of %Rs			X	
Matrix Spike/Matrix Spike Duplicate Data Included in Lab Package?	X			Batch QC; not assessed
1) MS/MSD %R (75-125%R) and RPD (+20%) criteria met? - %R>125% J positive results for affected analyte(s) for all samples in the same batch/SDG, accept NDs; -%R			X	
2) Was a sample spiked at the frequency of 1/batch or 20 samples?			X	
3) Was the MS performed on a site sample?			X	
4) Was the MS performed on a FB/EB or TB? If yes, J all sample data.			X	

ITEM	YES	NO	N/A	COMMENTS
Post Digestion Spike			X	
1) %R criteria met? (75-125%R) - %R>125% J positive results for affected analyte(s) for all samples in the same batch/SDG, accept NDs.; - %R			X	
2) Was the spike performed on a FB/EB or TB? If yes, J all sample data.			X	
3) Was a sample spiked at the frequency of 1/batch or 20 samples?			X	
Laboratory Duplicate Data Included in Lab Package?		X		MS/MSD analyses were performed in lieu of a laboratory duplicate.
Aqueous - If RPD is >20% but 5x the QL, estimate (J) results >the QL. - If RPD is >100%, reject R results >= the QL.- If sample and/or duplicate is the QL, estimate (J) positive results 2x the QL, reject R non-detects and positive results			X	
Soil - If RPD is >35% but 5x the QL, estimate (J) results > the QL. - If RPD is >120%, reject results > the QL. - If sample and/or duplicate is 2x the QL, estimate (J) positive results 4x the QL, reject nondetects and positive results			X	
Was a Laboratory Control Sample (LCS) Included in Lab Package?	X			
1) LCS %R criteria met? (80-120%R). If no, J/UJ all affected analytes(s) for all samples in the same batch/SDG.	X			
2) Was an LCS analyzed at the frequency of 1/batch or 20 samples? If no, J/UJ affected analyte(s) for all samples in the same batch/SDG.	X			
Serial Dilution			X	NA for a Limited Review
1) %D(25xIDL (7000) or >10xIDL (6010) and %D >10% J positive results for affected analyte(s) for all samples in the same batch/SDG, accept NDs.			X	
2) Was the frequency 1/batch or 20 samples?			X	
3) Was a site sample used?			X	
4) Was a FB/EB or TB used? If yes, J all sample data.			X	
5) Spot check accuracy of %Ds.			X	

ITEM	YES	NO	N/A	COMMENTS
Field Duplicate Data included in Lab Package?				FS13-8.0-8.5 and FS13-8.0-8.5X
Aqueous - If RPD is >20% but 5x the QL, estimate (J) results > the QL. - If RPD is >100%, reject R results >= the QL. - If sample and/or duplicate is the QL, estimate (J) positive results 2x the QL, reject R non-detects and positive results			X	
Soil - If RPD is >35% but 5x the QL, estimate (J) results > the QL. - If RPD is >120%, reject results > the QL. - If sample and/or duplicate is 2x the QL, estimate (J) positive results 4x the QL, reject nondetects and positive results	X			
Percent Solids data included in Lab Package?	X			
1) %Solids criteria (Reg 2 criteria) met? (>=50%)	X			

Laboratory Blanks

Blank ID	Analyte	Result	QL	Units	Associated Samples
MP77655-MB1	Chromium	0.32	1.0	mg/kg	All soil samples
MP77655-MB1	Nickel	0.16	4.0	mg/kg	

Data Validation Report

Project:	PPG Garfield Avenue Supplemental Remedial Investigation (GARIS) Forrest Street Groundwater and Soil	
Laboratory:	Accutest, Dayton, NJ	
Laboratory Job No.:	JB59519 and JB59519A	
Analysis/Method:	Hexavalent Chromium SW846 3060A/7196 Metals by ICP-AES/ SW846-6010	
Validation Level:	Full (Hexavalent Chromium) Limited (Metals)	
Site Location/Address:	Forrest Street, Jersey City, NJ	
AECOM Project No:	60154801.6001A	
Prepared by:	Paula DiMattei /AECOM	Completed on: 04/14/2014
Reviewed by:	Lisa Krowitz /AECOM	File Name: JB59519_A_2014-04-14_DV Report-F

Introduction

The data were reviewed in accordance with the FSP-QAPP and the following NJDEP validation Standard Operating Procedures (SOP):

- NJDEP Office of Data Quality SOP 5.A.10, Rev 3 (September 2009), SOP for Analytical Data Validation of Hexavalent Chromium - for USEPA SW-846 Method 3060A, USEPA SW-846 Method 7196A and USEPA SW-846 Method 7199;
- NJDEP Office of Data Quality SOP 5.A.16, Rev 1 (May 2002), Quality Assurance Data Validation of Analytical Deliverables for Inorganics (based on USEPA SW-846 Methods)

The results of quality control data analyzed with site samples were used to assess the overall reliability of the data. The following qualifiers were used to identify data quality issues:

- U: Indicates the analyte was not detected in the sample above the sample reporting limit.
- J: Indicates the result was an estimated value; the associated numerical value was an approximate concentration of the analyte in the sample.
- UJ: Indicates the analyte was not detected above the reporting limit and the reporting limit was approximate.
- R: The sample result was rejected due to serious deficiencies; the presence or absence of the analyte could not be confirmed.
- RA: The sample result was rejected but is still considered usable.

Sample Information

The samples listed below were collected by AECOM on February 7, 2014 as part of the PPG Garfield Avenue Supplemental Remedial Investigation (GARIS) - Forrest Street Groundwater and Soil sampling at the PPG Forrest Street site, Jersey City, NJ. Only the samples and parameters listed below were validated.

Field ID	Laboratory ID	Matrix	Fraction
FS13-20.0-20.5	JB59519-1	Soil	Hexavalent Chromium
FS13-20.0-20.5	JB59519-1A	Soil	Metals
FS13-22.0-22.5	JB59519-2	Soil	Hexavalent Chromium
FS13-22.0-22.5	JB59519-2A	Soil	Metals
FS13-22.0-22.5X (Field Duplicate of FS13-22.0-22.5)	JB59519-3	Soil	Hexavalent Chromium
FS13-22.0-22.5X (Field Duplicate of FS13-22.0-22.5)	JB59519-3A	Soil	Metals
FS13-24.0-24.5	JB59519-4	Soil	Hexavalent Chromium
FS13-24.0-24.5	JB59519-4A	Soil	Metals
FS13-26.0-26.5	JB59519-5	Soil	Hexavalent Chromium
FS13-26.0-26.5	JB59519-5A	Soil	Metals
FS13-28.0-28.5	JB59519-6	Soil	Hexavalent Chromium
FS13-28.0-28.5	JB59519-6A	Soil	Metals
FS13-30.0-30.5	JB59519-8	Soil	Hexavalent Chromium
FS13-30.0-30.5	JB59519-8A	Soil	Metals
FS13-32.0-32.5	JB59519-9	Soil	Hexavalent Chromium
FS13-32.0-32.5	JB59519-9A	Soil	Metals
FS13-34.0-34.5	JB59519-10	Soil	Hexavalent Chromium
FS13-34.0-34.5	JB59519-10A	Soil	Metals
FS13-36.0-36.5	JB59519-11	Soil	Hexavalent Chromium
FS13-36.0-36.5	JB59519-11A	Soil	Metals
FS13-38.0-38.5	JB59519-12	Soil	Hexavalent Chromium
FS13-38.0-38.5	JB59519-12A	Soil	Metals
FS13GW-30.0-34.0	JB59519-7	Ground Water	Hexavalent Chromium
FS13GW-30.0-34.0	JB59519-7A	Ground Water	Metals
FS13GW-40.0-44.0	JB59519-13	Ground Water	Hexavalent Chromium
FS13GW-40.0-44.0	JB59519-13A	Ground Water	Metals
FS-FB20140210 (Equipment Blank)	JB59519-14	Aqueous	Hexavalent Chromium
FS-FB20140210 (Equipment Blank)	JB59519-14A	Aqueous	Metals

The samples were collected following the procedures detailed in the Remedial Investigation Work Plan - Soil for Non-Residential Chromate Chemical Production Waste Sites 114, 132, 133, 135, 137, 143, and 186, Jersey City, New Jersey, or applicable proposal or work plan, and the Field Sampling Plan/Quality Assurance Project Plan for Non-Residential and Residential Chromium Sites Hudson County, New Jersey (December 2011).

General Comments

The data package was complete. Quality control (QC) issues identified during validation are discussed below. Refer to the Target Analyte Summary Hit(s) in Attachment A for a listing of all detected results, qualified results, and associated qualifications, where applicable. The nonconformances for each section discussed below are presented in Attachment B.

Hexavalent Chromium

MS Results

Sample FS13-20.0-20.5 was selected for the matrix spike (MS) analysis associated with the soil samples in this SDG and was used for supporting data quality recommendations. The soluble and insoluble MS recoveries were 83.3% and 100.8%, respectively; which met the quality control (QC) criteria of 75-125%. The post digestion spike (PDS) recovery was 98.9%, which met the PDS criteria of 85-115%. No data qualification was required on the basis of spike recoveries.

Sample FS13GW-30.0-34.0 was selected for the MS analysis associated with the groundwater samples in this SDG. The MS recovery was 27.3%, which did not meet the QC recovery criteria of 85-115%. Additionally, the PDS was 35.3%, which did not meet the PDS recovery criteria of 85-115%. Consequently, all aqueous samples were qualified as estimated (UJ).

Sample Results

Reported results (flagged B by the laboratory) that were less than the reporting limit (RL), but greater than or equal to the method detection limit (MDL) are approximate values and have been qualified as estimated (J).

Metals

Laboratory Blanks/Equipment Blanks

Method Blank

Antimony was detected in the method blank (MP77688-MB1) associated with the aqueous samples in this SDG, at a concentration above the MDL, but below the RL. The positive result for antimony in the equipment blank FS-FB20140210 was negated (U) at the detected value based on method blank contamination. Antimony was not detected in the associated groundwater samples, thus qualification was not required.

Nickel was detected in the method blank (MP77674-MB1) associated with the soil samples in this SDG, at a concentration above the MDL, but below the RL. Since the results for nickel in the associated soil samples were greater than ten times the amount detected in the method blank, no qualifications were required.

MS Results

Sample FS13-20.0-20.5 (JB59519-1A) was selected for the MS analysis associated with the soil samples in this SDG. Sample FS13GW-30.0-34.0 (JB59519-7A) was selected for the MS analysis associated with the groundwater samples in this SDG.

For the MS analysis on sample FS13-20.0-20.5, the recovery of antimony did not meet the QC criteria of 75-125%. The nondetect results for antimony in the associated soil samples were qualified as estimated (UJ) with potential low bias.

For the MS analysis on sample FS13GW-30.0-34.0, the recovery of chromium did not meet the QC criteria of 75-125% or the relative percent difference (RPD) criteria of <20% RPD. The positive results for chromium in the associated groundwater samples were qualified as estimated (J) with potential bias in an unknown direction due to high MS recovery and high MS/MSD RPD.

Sample Results

Reported results (flagged B by the laboratory) that were less than the RL, but greater than or equal to the MDL are approximate values that have been qualified as estimated (J).

Data Quality and Usability

In general, these data appear to be valid and may be used for decision-making purposes. No data were rejected. Qualified results, if applicable, are presented in Attachments A and B.

The hexavalent chromium results for the aqueous samples are usable as estimated values with potential low bias due to the low MS recovery.

The negated antimony result in the equipment blank FS-FB20140210 is usable as a nondetect result.

Soil sample results for antimony qualified due to low MS recovery are usable as estimated values with potential low bias.

Aqueous sample results for chromium qualified due to high MS recovery and poor MS/MSD precision are usable as estimated values with an unknown directional bias.

Sample results reported between the MDL and RL are usable as estimated values with an unknown directional bias.

ATTACHMENTS

Attachment A: Target Analyte Summary Hitlist(s)

Attachment B: Data Validation Report Form

Attachment A

Target Analyte Summary Hitlist(s)

Soil Target Analyte Summary Hit List (Hexavalent Chromium)

Site Name PPG Garfield Avenue Supplemental Remedial Investigation (GARIS) Forrest Street
Sampling Date February 10, 2014
Lab Name/ID Accutest, Dayton, NJ
SDG No JB59519
Sample Matrix Soil
Trip Blank ID NA
Field Blank ID FS-FB20140210

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
FS13-22.0-22.5	JB59519-2	CHROMIUM (HEXAVALENT)	U	0.11B	0.11	0.48	Qualify	31
FS13-22.0-22.5X	JB59519-3	CHROMIUM (HEXAVALENT)	U	0.22B	0.22	0.48	Qualify	31
FS13-24.0-24.5	JB59519-4	CHROMIUM (HEXAVALENT)	U	0.10B	0.10	0.48	Qualify	31
FS13-30.0-30.5	JB59519-8	CHROMIUM (HEXAVALENT)	U	0.30B	0.3	0.44	Qualify	31
FS13-34.0-34.5	JB59519-10	CHROMIUM (HEXAVALENT)	U	0.34B	0.34	0.52	Qualify	31
FS13-36.0-36.5	JB59519-11	CHROMIUM (HEXAVALENT)	U	0.11B	0.11	0.50	Qualify	31
FS13-38.0-38.5	JB59519-12	CHROMIUM (HEXAVALENT)	U	0.22B	0.22	0.48	Qualify	31

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

NJDEP Laboratory Footnote

1. The value reported is less than or equal to 3x the value in the preparation/reagent blank. It is the policy of NJDEP-DPFSR to negate the reported value due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.

2. The value reported is greater than three (3) times but less than ten (10) times the value in the preparation/reagent blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to the preparation/reagent blank contamination. The "B" qualifier alerts the end-user to the presence of this analyte in the preparation/reagent blank.

3. The value reported is less than or equal to three (3) times the value in the trip/field blank. It is the policy of NJDEP-DPF SR to negate the reported value as due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
4. The value reported is greater than three (3) times but less than ten (10) times the value in the trip/field blanks and is considered "real". However, the reported value must be quantitatively qualified "J" due to trip/field blank contamination.
5. The concentration reported by the laboratory is incorrectly calculated.
6. The laboratory failed to report the presence of the analyte in the sample.
7. The reported Hexavalent Chromium value was qualified because the Calibration Check Standard was not within the recovery range (90-110 percent).
8. In the Duplicate Sample Analysis, Hexavalent Chromium fell outside the control limits of ≤ 20 percent for sample results $> 4xRL$ or $+ RL$ for sample results $< 4xRL$. Therefore, the result was qualified.
9. This analyte was rejected because the laboratory performed the Duplicate Analysis on a field blank.
10. The reported value was qualified because the PVS recovery was greater than 115 percent.
11. The reported value was qualified because the PVS recovery was less than 85 percent.
12. The non-detected value was qualified (UJ) because the PVS recovery was less than 85 percent. The possibility of a false negative exists.
13. The reported analyte was qualified because the associated Calibration Blank result was greater than the MDL.
14. The laboratory made a transcription error. No hits were found in the raw data.
15. This analyte is qualified or rejected because the laboratory exceeded the holding time for digestion and/or analysis.
16. The laboratory subtracted the preparation/reagent blank from the sample result. The Reviewer's calculation puts the preparation/reagent blank back into the result.
17. The photocopy is unreadable. Therefore, the QA reviewer cannot read the laboratory's reported concentration result.

18. The reported value was qualified because the predigestion spike recovery was less than 75 %, but greater than 50%.
19. The reported value was qualified because the predigestion spike recovery was greater than 125 percent.
20. The non-detected value was qualified (UJ) because the redigestion spike recovery was less than 75 percent. The possibility of a false negative exists.
21. The reported result was qualified or rejected because the laboratory did not record the pH value(s) of the sample in a laboratory notebook.
22. The reported value was qualified (J/UJ) because the sample moisture content exceeded 50 percent.
23. The sample result was rejected because the soluble and insoluble matrix spike recoveries were less than 50%.
24. The detected sample result was qualified (J) because the incorrect spike concentration was used.
25. The reported sample results were rejected because the predigestion spike recovery was greater than 150 percent.
26. The reported sample results were rejected because the redigestion spike recovery was greater than 150 percent.
27. The reported value was qualified (J) because the redigestion spike recovery was less than 75 percent.
28. The reported value was qualified (J/UJ) because the sample digestion temperature was less than 90C.
29. In the Field Duplicate Sample Analysis, Hexavalent Chromium fell outside the control limits of $\leq 20\%$ for sample results $> 4xRL$ or $+ RL$ for sample results $< 4xRL$. Therefore, the result was qualified.
30. The reported value was qualified as estimated (J/UJ) but the bias is uncertain due to both high and low MS recoveries.
31. The reported result was greater than the MDL but less than the RL and qualified (J) as estimated by the laboratory.
32. The reported value was qualified because the sample replicate precision criterion of $\leq 20\%$ for method 7199 was exceeded.
33. The reported value was qualified (J/UJ) because the laboratory control sample (LCS) recovery was less than 80%.

34. The reported value was qualified (J) because the laboratory control sample (LCS) recovery was greater than 120%.
35. The reported result was qualified because the matrix spike analysis was not performed at the proper frequency.
36. The reported result was qualified because the laboratory duplicate analysis was not performed at the proper frequency.
37. The result was qualified because the cooler temperature upon sample receipt exceeded 6C.
38. The reported value was qualified because the redigestion spike recovery was greater than 125 percent.
39. The reported result was rejected because the laboratory failed to perform the reanalysis due to insufficient sample volume.
40. The reported results was qualified because the laboratory failed to analyze an ending CCB.
41. The reported result was qualified because the laboratory failed to make the proper method specific pH adjustment.
42. The reported result was rejected because the laboratory failed to reanalyze the MS and associated sample(s) due to failed MS recoveries.

Aqueous Target Analyte Summary Hit List (Hexavalent Chromium)

Site Name PPG Garfield Avenue Supplemental Remedial Investigation (GARIS) Forrest Street
Sampling Date February 10, 2014
Lab Name/ID Accutest, Dayton, NJ
SDG No JB59519
Sample Matrix Soil
Trip Blank ID NA
Field Blank ID FS-FB20140210

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/L)	Laboratory Sample Result (mg/L)	Validation Sample Result (mg/L)	RL (mg/L)	Quality Assurance Decision	NJDEP Validation Footnote
FS13GW-30.0-34.0	JB59519-7	CHROMIUM (HEXAVALENT)	U	U	U	0.010	Qualify	18
FS13GW-40.0-44.0	JB59519-13	CHROMIUM (HEXAVALENT)	U	U	U	0.010	Qualify	18
FS-FB20140210	JB59519-14	CHROMIUM (HEXAVALENT)	U	U	U	0.010	Qualify	18

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

NJDEP Laboratory Footnote

1. The value reported is less than or equal to 3x the value in the preparation/reagent blank. It is the policy of NJDEP-DPFSR to negate the reported value due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
2. The value reported is greater than three (3) times but less than ten (10) times the value in the preparation/reagent blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to the preparation/reagent blank contamination. The "B" qualifier alerts the end-user to the presence of this analyte in the preparation/reagent blank.
3. The value reported is less than or equal to three (3) times the value in the trip/field blank. It is the policy of NJDEP-DPFSR to negate the reported value as due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
4. The value reported is greater than three (3) times but less than ten (10) times the value in the trip/field blanks and is considered "real". However, the reported value must be quantitatively qualified "J" due to trip/field blank contamination.

5. The concentration reported by the laboratory is incorrectly calculated.
6. The laboratory failed to report the presence of the analyte in the sample.
7. The reported Hexavalent Chromium value was qualified because the Calibration Check Standard was not within the recovery range (90-110 percent).
8. In the Duplicate Sample Analysis, Hexavalent Chromium fell outside the control limits of ≤ 20 percent for sample results $> 4xRL$ or $+ RL$ for sample results $< 4xRL$. Therefore, the result was qualified.
9. This analyte was rejected because the laboratory performed the Duplicate Analysis on a field blank.
10. The reported value was qualified because the PVS recovery was greater than 115 percent.
11. The reported value was qualified because the PVS recovery was less than 85 percent.
12. The non-detected value was qualified (UJ) because the PVS recovery was less than 85 percent. The possibility of a false negative exists.
13. The reported analyte was qualified because the associated Calibration Blank result was greater than the MDL.
14. The laboratory made a transcription error. No hits were found in the raw data.
15. This analyte is qualified or rejected because the laboratory exceeded the holding time for digestion and/or analysis.
16. The laboratory subtracted the preparation/reagent blank from the sample result. The Reviewer's calculation puts the preparation/reagent blank back into the result.
17. The photocopy is unreadable. Therefore, the QA reviewer cannot read the laboratory's reported concentration result.
18. The reported value was qualified because the predigestion spike recovery was less than 75 %, but greater than 50%.
19. The reported value was qualified because the predigestion spike recovery was greater than 125 percent.
20. The non-detected value was qualified (UJ) because the redigestion spike recovery was less than 75 percent. The possibility of a false negative exists.

21. The reported result was qualified or rejected because the laboratory did not record the pH value(s) of the sample in a laboratory notebook.
22. The reported value was qualified (J/UJ) because the sample moisture content exceeded 50 percent.
23. The sample result was rejected because the soluble and insoluble matrix spike recoveries were less than 50%.
24. The detected sample result was qualified (J) because the incorrect spike concentration was used.
25. The reported sample results were rejected because the predigestion spike recovery was greater than 150 percent.
26. The reported sample results were rejected because the redigestion spike recovery was greater than 150 percent.
27. The reported value was qualified (J) because the redigestion spike recovery was less than 75 percent.
28. The reported value was qualified (J/UJ) because the sample digestion temperature was less than 90C.
29. In the Field Duplicate Sample Analysis, Hexavalent Chromium fell outside the control limits of $\leq 20\%$ for sample results $> 4xRL$ or $+ RL$ for sample results $< 4xRL$. Therefore, the result was qualified.
30. The reported value was qualified as estimated (J/UJ) but the bias is uncertain due to both high and low MS recoveries.
31. The reported result was greater than the MDL but less than the RL and qualified (J) as estimated by the laboratory.
32. The reported value was qualified because the sample replicate precision criterion of $\leq 20\%$ for method 7199 was exceeded.
33. The reported value was qualified (J/UJ) because the laboratory control sample (LCS) recovery was less than 80%.
34. The reported value was qualified (J) because the laboratory control sample (LCS) recovery was greater than 120%.
35. The reported result was qualified because the matrix spike analysis was not performed at the proper frequency.
36. The reported result was qualified because the laboratory duplicate analysis was not performed at the proper frequency.
37. The result was qualified because the cooler temperature upon sample receipt exceeded 6C.

38. The reported value was qualified because the redigestion spike recovery was greater than 125 percent.
39. The reported result was rejected because the laboratory failed to perform the reanalysis due to insufficient sample volume.
40. The reported results was qualified because the laboratory failed to analyze an ending CCB.
41. The reported result was qualified because the laboratory failed to make the proper method specific pH adjustment.
42. The reported result was rejected because the laboratory failed to reanalyze the MS and associated sample(s) due to failed MS recoveries.

Soil Target Analyte Summary Hit List (Metals)

Site Name PPG Garfield Avenue Supplemental Remedial Investigation (GARIS) Forrest Street
Sampling Date February 10, 2014
Lab Name/ID Accutest, Dayton, NJ
SDG No JB59519A
Sample Matrix Soil
Trip Blank ID NA
Field Blank ID FS-FB20140210

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
FS13-20.0-20.5	JB59519-1A	ANTIMONY	U	U	U	2.6	Qualify	15
FS13-20.0-20.5	JB59519-1A	CHROMIUM	U	11.0	11.0	1.3		
FS13-20.0-20.5	JB59519-1A	NICKEL	U	8.7	8.7	5.2		
FS13-20.0-20.5	JB59519-1A	THALLIUM	U	0.67B	0.67	1.3	Qualify	23
FS13-20.0-20.5	JB59519-1A	VANADIUM	U	16.8	16.8	6.5		
FS13-22.0-22.5	JB59519-2A	ANTIMONY	U	U	U	2.5	Qualify	15
FS13-22.0-22.5	JB59519-2A	CHROMIUM	U	9.3	9.3	1.2		
FS13-22.0-22.5	JB59519-2A	NICKEL	U	7.3	7.3	4.9		
FS13-22.0-22.5	JB59519-2A	THALLIUM	U	0.50B	0.50	1.2	Qualify	23
FS13-22.0-22.5	JB59519-2A	VANADIUM	U	13.0	13.0	6.1		
FS13-22.0-22.5X	JB59519-3A	ANTIMONY	U	U	UJ	2.5	Qualify	15
FS13-22.0-22.5X	JB59519-3A	CHROMIUM	U	7.9	7.9	1.2		
FS13-22.0-22.5X	JB59519-3A	NICKEL	U	6.2	6.2	5.0		
FS13-22.0-22.5X	JB59519-3A	VANADIUM	U	11.9	11.9	6.2		
FS13-24.0-24.5	JB59519-4A	ANTIMONY	U	U	U	2.5	Qualify	15
FS13-24.0-24.5	JB59519-4A	CHROMIUM	U	13.2	13.2	1.2		
FS13-24.0-24.5	JB59519-4A	NICKEL	U	9.9	9.9	5.0		

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
FS13-24.0-24.5	JB59519-4A	THALLIUM	U	0.76B	0.76	1.2	Qualify	23
FS13-24.0-24.5	JB59519-4A	VANADIUM	U	21.0	21.0	6.2		
FS13-26.0-26.5	JB59519-5A	ANTIMONY	U	U	U	2.5	Qualify	15
FS13-26.0-26.5	JB59519-5A	CHROMIUM	U	6.2	6.2	1.2		
FS13-26.0-26.5	JB59519-5A	NICKEL	0.090	3.5B	3.5	5.0	Qualify	23
FS13-26.0-26.5	JB59519-5A	THALLIUM	U	0.37B	0.37	1.2	Qualify	23
FS13-26.0-26.5	JB59519-5A	VANADIUM	U	9.2	9.2	6.2		
FS13-28.0-28.5	JB59519-6A	ANTIMONY	U	U	UJ	2.4	Qualify	15
FS13-28.0-28.5	JB59519-6A	CHROMIUM	U	6.5	6.5	1.2		
FS13-28.0-28.5	JB59519-6A	NICKEL	0.090	4.2B	4.2	4.9	Qualify	23
FS13-28.0-28.5	JB59519-6A	VANADIUM	U	10.5	10.5	6.1		
FS13-30.0-30.5	JB59519-8A	ANTIMONY	U	U	U	2.2	Qualify	15
FS13-30.0-30.5	JB59519-8A	CHROMIUM	U	19.5	19.5	1.1		
FS13-30.0-30.5	JB59519-8A	NICKEL	0.090	10.8	10.8	4.5		
FS13-30.0-30.5	JB59519-8A	THALLIUM	U	0.51B	0.51	1.1	Qualify	23
FS13-30.0-30.5	JB59519-8A	VANADIUM	U	32.0	32.0	5.6		
FS13-32.0-32.5	JB59519-9A	ANTIMONY	U	U	U	2.5	Qualify	15
FS13-32.0-32.5	JB59519-9A	CHROMIUM	U	14.7	14.7	1.3		
FS13-32.0-32.5	JB59519-9A	NICKEL	0.090	9.2	9.2	5.0		
FS13-32.0-32.5	JB59519-9A	VANADIUM	U	16.7	16.7	6.3		
FS13-34.0-34.5	JB59519-10A	ANTIMONY	U	U	U	2.7	Qualify	15
FS13-34.0-34.5	JB59519-10A	CHROMIUM	U	20.1	20.1	1.4		
FS13-34.0-34.5	JB59519-10A	NICKEL	0.090	14.9	14.9	5.5		
FS13-34.0-34.5	JB59519-10A	THALLIUM	U	0.85B	0.85	1.4	Qualify	23
FS13-34.0-34.5	JB59519-10A	VANADIUM	U	19.2	19.2	6.9		

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
FS13-36.0-36.5	JB59519-11A	ANTIMONY	U	U	U	2.6	Qualify	15
FS13-36.0-36.5	JB59519-11A	CHROMIUM	U	18.0	18.0	1.3		
FS13-36.0-36.5	JB59519-11A	NICKEL	0.090	7.3	7.3	5.1		
FS13-36.0-36.5	JB59519-11A	THALLIUM	U	1.2B	1.2	1.3	Qualify	23
FS13-36.0-36.5	JB59519-11A	VANADIUM	U	17.3	17.3	6.4		
FS13-38.0-38.5	JB59519-12A	ANTIMONY	U	U	U	2.4	Qualify	15
FS13-38.0-38.5	JB59519-12A	CHROMIUM	U	15.2	15.2	1.2		
FS13-38.0-38.5	JB59519-12A	NICKEL	0.090	7.5	7.5	4.8		
FS13-38.0-38.5	JB59519-12A	VANADIUM	U	20.2	20.2	5.9		

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

NJDEP Laboratory Footnote

1. The value reported is less than or equal to 3x the value in the method blank. It is the policy of NJDEP-DPFSR to negate the reported value due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
2. The value reported is greater than three (3) but less than ten (10) times the value in the method blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to the method blank contamination. The "B" qualifier alerts the end-user to the presence of this analyte in the method blank.
3. The value reported is less than or equal to 3x the value in the trip/field blank. It is the policy of NJDEP-DPFSR to negate the reported value as due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
4. The value reported is greater than 3x but less than ten (10) the value in the trip/field blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to trip/field blank contamination.
5. The concentration reported by the laboratory is incorrectly calculated.

6. The laboratory failed to report the presence of the analyte in the sample.
7. The reported metal value was qualified because the Calibration Verification Standard was not within the recovery range (90-110 percent).
8. In the MS/MSD Sample Analysis, this analyte fell outside the control limits of 20% RPD. Therefore, the result was qualified.
9. This analyte was qualified because the laboratory performed the MS/MSD Analysis on a field blank.
10. The reported analyte was qualified because the associated Calibration Blank result was greater than the MDL.
11. The reported value was qualified because serial dilution analysis was not within QC limit of 10% D.
12. This analyte is rejected because the laboratory exceeded the holding time for digestion and analysis.
13. The laboratory subtracted the method blank from the sample result. The reviewer's calculation has added the method blank result to the reported concentration.
14. The photocopy submitted is illegible. Therefore, the QA reviewer cannot read the laboratory's reported concentration result.
15. The reported or nondetected value was qualified because the MS/MSD spike recovery was less than 75 percent.
16. The reported value was qualified because the MS/MSD spike recovery was greater than 125 percent.
17. The reported value was qualified as estimated (J/UJ) but the bias is uncertain due to both high and low MS recoveries.
18. The reported values were qualified because the laboratory duplicate exceeded 35 percent RPD for results greater than 5X the reporting limit or the absolute difference exceeded two times the reporting limit for sample result less than 5 times the reporting limit.
19. The reported value was qualified because the field duplicate exceeded 35 percent RPD for results greater than 5X the reporting limit or the absolute difference exceeded two times the reporting limit for sample result less than 5 times the reporting limit.
20. The reported value was qualified because the LCS recovery was less than 80 percent.
21. The reported value was qualified because the sample moisture content was greater than 50 percent.

22. The reported value was rejected because the field duplicate absolute difference was greater than 4 times the RL or the RPD was greater than 120%.
23. The reported result was greater than the MDL but less than the RL and qualified (J) as estimated by the laboratory.
24. The field duplicate absolute difference exceeded two times the reporting limit for sample result less than 5 times the reporting limit.
25. The reported value was qualified because the LCS recovery was greater than 120 percent.

Aqueous Target Analyte Summary Hit List (Metals)

Site Name PPG Garfield Avenue Supplemental Remedial Investigation (GARIS) Forrest Street
Sampling Date February 10, 2014
Lab Name/ID Accutest, Dayton, NJ
SDG No JB59519A
Sample Matrix Groundwater
Trip Blank ID NA
Field Blank ID NA

Field Sample ID	Lab Sample ID	Analyte	Method Blank (ug/L)	Laboratory Sample Result (ug/L)	Validation Sample Result (ug/L)	RL (ug/L)	Quality Assurance Decision	NJDEP Validation Footnote
FS13GW-30.0-34.0	JB59519-7A	CHROMIUM	U	3510	3510	50	Qualify	8,16
FS13GW-40.0-44.0	JB59519-13A	CHROMIUM	U	3420	3420	50	Qualify	8,16
FS-FB20140210	JB59519-14A	ANTIMONY	2.8	4.3B	U	6.0	Negate	1

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

NJDEP Laboratory Footnote

1. The value reported is less than or equal to 3x the value in the method blank. It is the policy of NJDEP-DPFSR to negate the reported value due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
2. The value reported is greater than three (3) but less than ten (10) times the value in the method blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to the method blank contamination. The "B" qualifier alerts the end-user to the presence of this analyte in the method blank.
3. The value reported is less than or equal to 3x the value in the trip/field blank. It is the policy of NJDEP-DPFSR to negate the reported value as due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
4. The value reported is greater than 3x but less than ten (10) the value in the trip/field blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to trip/field blank contamination.

5. The concentration reported by the laboratory is incorrectly calculated.
6. The laboratory failed to report the presence of the analyte in the sample.
7. The reported metal value was qualified because the Calibration Verification Standard was not within the recovery range (90-110 percent).
8. In the MS/MSD Sample Analysis, this analyte fell outside the control limits of 20% RPD. Therefore, the result was qualified.
9. This analyte was qualified because the laboratory performed the MS/MSD Analysis on a field blank.
10. The reported analyte was qualified because the associated Calibration Blank result was greater than the MDL.
11. The reported value was qualified because serial dilution analysis was not within QC limit of 10% D.
12. This analyte is rejected because the laboratory exceeded the holding time for digestion and analysis.
13. The laboratory subtracted the method blank from the sample result. The reviewer's calculation has added the method blank result to the reported concentration.
14. The photocopy submitted is illegible. Therefore, the QA reviewer cannot read the laboratory's reported concentration result.
15. The reported or nondetected value was qualified because the MS/MSD spike recovery was less than 75 percent.
16. The reported value was qualified because the MS/MSD spike recovery was greater than 125 percent.
17. The reported value was qualified as estimated (J/UJ) but the bias is uncertain due to both high and low MS recoveries.
18. The reported values were qualified because the laboratory duplicate exceeded 35 percent RPD for results greater than 5X the reporting limit or the absolute difference exceeded two times the reporting limit for sample result less than 5 times the reporting limit.
19. The reported value was qualified because the field duplicate exceeded 35 percent RPD for results greater than 5X the reporting limit or the absolute difference exceeded two times the reporting limit for sample result less than 5 times the reporting limit.
20. The reported value was qualified because the LCS recovery was less than 80 percent.
21. The reported value was qualified because the sample moisture content was greater than 50 percent.

22. The reported value was rejected because the field duplicate absolute difference was greater than 4 times the RL or the RPD was greater than 120%.
23. The reported result was greater than the MDL but less than the RL and qualified (J) as estimated by the laboratory.
24. The field duplicate absolute difference exceeded two times the reporting limit for sample result less than 5 times the reporting limit.
25. The reported value was qualified because the LCS recovery was greater than 120 percent.

Attachment B

Data Validation Report Form

Client Name: PPG Industries	Project Number: 60154801.6001A
Site Location: PPG Garfield Avenue Supplemental Remedial Investigation (GARIS) Forrest Street Groundwater and Soil, Jersey City, NJ	Project Manager: William Spronz
Laboratory: Accutest, Dayton, NJ	Type of Validation: Full
Laboratory Job No: JB59519	Date Checked: 4/14/14
Validator: Paula DiMattei	Peer: Lisa Krowitz

ITEM	YES	NO	N/A	COMMENTS
Sample results included?	X			
Reporting Limits met project requirements?	X			
Field I.D. included?	X			
Laboratory I.D. included?	X			
Sample matrix included?	X			
Sample receipt temperature 2-6C?		X		One cooler temp. was 1°C. no actions required.
Signed COCs included?	X			
Date of sample collection included?	X			
Date of sample digestion included?	X			
Holding time to digestion met criteria? (Soils -30 days from collection to digestion.)	X			
Date of analysis included?	X			
Holding time to analysis met criteria? (Soils -168 hours from digestion to analysis; Aqueous - 24 hours from collection to analysis.)	X			
Method reference included?	X			
Laboratory Case Narrative included?	X			

Definitions: MDL Method Detection Limit; %R Percent Recovery; RL Reporting Limit; RPD Relative Percent Difference; RSD Relative Standard Deviation :Corr Correlation Coefficient.

ITEM	YES	NO	N/A	COMMENTS
Initial calibration documentation included in lab package?	X			
1) Blank plus 4 standards (7196A) or blank plus 3 standards (7199)	X			
2) Correlation coefficient of =0.995 (7196A) or =0.999 (7199)	X			
3) Calibrate daily or each time instrument is set up.	X			
Calibration Check Standard (CCS) for 7196A and Quality Control Sample (QCS) for 7199 Included in Lab Package?	X			
1) %R criteria met? (90 - 110%)	X			
2) Correct frequency of one per every 10 samples	X			
3) CCS and QCS from independent source and at mid-level of calibration curve	X			
Calibration Blanks	X			
1) Analyzed prior to initial calibration standards and after each CCS/QCS?	X			
2) Absolute value should not exceed MDL.	X			
Method Blank, Field Blanks and/or Equipment Blanks Included in Lab Package?	X			FS-FB20140210
1) Method blank analyzed with each preparation batch?	X			
2) Absolute value should not exceed MDL.	X			
Eh and pH Data	X			
1) Eh and pH data was included and plotted for all samples?	X			
Soluble Matrix Spike Data Included in Lab Package?	X			Soil MS: FS13-20.0-20.5; Aqueous MS: FS13GW-30.0-34.0
1) Soluble Matrix %R criteria met? (75-125%R).		X		See nonconformance table below for aqueous MS.
2) Was the spike concentration 40 mg/Kg or twice the sample concentration?	X			
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	X			
Insoluble Matrix Spike Data Included in Lab Package?	X			
1) Insoluble Matrix %R criteria met? (75-125%R).	X			
2) Was the spike concentration around 400 to 800 mg/Kg?		X		Spiked at 954 mg/kg. No impact to data.
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	X			

ITEM	YES	NO	N/A	COMMENTS
Post Digestion Spike	X			
1) Post Digestion Spike %R criteria met? (85-115%R).	X			
2) Was the spike concentration 40 mg/Kg or twice the sample concentration?	X			
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	X			
Sample Duplicate Data Included in Lab Package?				Soil : FS13-20.0-20.5; Aqueous: FS13GW-30.0-34.0
1) RPD criteria met? (RPD ≤20%) if both results are ≤4x RL or absolute difference ≤RL if either or both results are <4xRL.	X			
2) Was a sample duplicate analyzed at the frequency of 1 per batch or 20 samples?	X			
Was a Laboratory Control Sample (LCS) Included in Lab Package?	X			
1) %R criteria met? (80-120%R).	X			
2) Was an LCS analyzed at the frequency of 1/batch or 20 samples?	X			
Were any Field Duplicate samples submitted with this SDG?	X			FS13-22.0-22.5 and FS13-22.0-22.5X
1) Were Field duplicate RPD criteria met? (RPD≤20% for both sample results >4xRL or absolute difference ≤ RL if either or both results are <4xRL.	X			
Were all sample quantitation and reporting requirements met?	X			
1) Were all solid samples reported with percent solids > 50% ?	X			
2) Were any samples analyzed or reported with dilutions?		X		
Miscellaneous Items	X			
1) For soils by 7196A, was the pH within a range of 7.0-8.0?	X			
2) For soils by 7199, was the pH within a range of 9.0-9.5?			X	
3) For aqueous by 7196A, was the pH with a range of 1.5-2.5?	X			
4) For soils (3060A), was the digestion temperature 90-95C for at least 60 minutes?	X			
5) For 7199, was each sample injected twice and was the RPD =20?			X	

Matrix Spikes

Sample ID	Analyte	Analysis Batch	MS % Recovery	PDS % Recovery	Lower Limit	Upper Limit
FS13GW-30.0-34.0	CHROMIUM (HEXAVALENT)	GN99228	27.3	35.3	85	115

SDG#: JB59519
Batch: GN99556
 Cr+6 ICAL 02/17/14
 Soil
 (p. 59 of data pkg)

x - concentration	y - response
0	0
0.01	0.009
0.05	0.042
0.1	0.088
0.3	0.263
0.5	0.443
0.8	0.699
1	0.877

(p. 59 of data pkg)

AECOM Calculated Intercept	0.00009	OK	Reported intercept	0.00009
AECOM Slope	0.8769	OK	Reported Slope	0.8769
AECOM Calculated r	0.99998	OK	Reported r	0.99998

LCS calculation

GP77901-B1 pgs. 59

Background Absorbance 0
 Total absorbance 0.855
 Total absorbance - background 0.855
 Instrument Concentration 0.975
 Sample weight (mg/kg) 0.0025
 Final Volume (L) 0.1
 Dilution Factor 1

AECOM Calculated LCS Result (mg/Kg)	39.0	OK	Reported Result (mg/Kg)	39.0
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%R = Found/True*100

p. 33

True Value (mg/kg) 40

AECOM Calculated %R	97.5	OK	Reported %R	97.5
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MS calculation

JB59519-1 [FS13-20.0-20.5] pg. 59

Background reading 0
 Total absorbance 0.35
 Total absorbance - background 0.35
 Instrument Concentration 0.3990
 Sample weight (mg/kg) 0.00258
 Final Volume (L) 0.1
 Percent solids 0.804
 Dilution Factor 50

AECOM Calculated MS Result (mg/Kg)	962	OK	Reported Result (mg/Kg)	962
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%R = Found/True*100

JB59519-1 [FS13-20.0-20.5] pg. 42

True Value (mg/kg) 954

Native concentration (mg/Kg) 0

AECOM%R	100.8	OK	Reported %R	100.8
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Percent Solids

JB59519-1 [FS13-20.0-20.5] pg. 43

Empty dish weight= 22.31
 Wet weight= 28.12
 Dry weight= 26.98

AECOM%solids =	80.4	OK	reported %solids=	80.4
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Reporting Limit		JB59519-1 [FS13-20.0-20.5] pg. 43	
Low Standard		0.01	
Initial weight (mg/kg)		0.00251	
Final volume (L)		0.1	
Percent solids		0.804	
Dilution Factor		1	
Reporting Limit		0.50	ok Reported RL (mg/Kg)= 0.50

Sample Calculations

Sample Calculations		JB59519-1 [FS13-20.0-20.5] pg. 43, 59	
Background reading		0.003	
Total absorbance		0.004	
Total absorbance - background		0.001	
Instrument Response		0.001	
Sample weight (mg/kg)		0.00251	
Final Volume (L)		0.1	
Percent solids		0.804	
Dilution Factor		1	
AECOM Calculated Result (mg/Kg)		0.05	OK ND< 0.086 Reported Result (mg/Kg) 0.086 U

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Laboratory: Accutest, Dayton, NJ	Type of Validation: Limited
Laboratory Job No: JB59519A	Date Checked: 4/14/14
Validator: Paula DiMattei	Peer: Lisa Krowitz

ITEM	YES	NO	N/A	COMMENTS
Sample results included?	X			
Reporting Limits met project requirements?	X			
Field I.D. included?	X			
Laboratory I.D. included?	X			
Sample matrix included?	X			
Sample receipt temperature 2-6C?		X		One cooler temp. was 1°C. No actions required.
Signed COCs included?	X			
Date of sample collection included?	X			
Date of sample digestion included?	X			
Date of analysis included?	X			
Holding time met QC criteria? (Metals -180 days from sample collection; Mercury - 28 days from sample collection. If HT exceeded by 10 days R all results.	X			
Method reference included?	X			
Laboratory Case Narrative included?	X			

Definitions: MDL Method Detection Limit; %R Percent Recovery; RL Reporting Limit; RPD Relative Percent Difference; RSD Relative Standard Deviation ;Corr Correlation Coefficient.

ITEM	YES	NO	N/A	COMMENTS
Sample dilutions?		X		
Initial calibration documentation included in lab package?			X	NA for a Limited Review
1) Calibrate daily or each time instrument is set up.			X	
2) ICP (6010) -Blank plus 1 standard? If no, reject (R) data.			X	
3) Hg (7470/7471) -Blank plus 5 standards? If no, reject (R) data.			X	
Initial Calibration Verification Standard (ICV) for ICP (6010) and Initial Calibration Check Standard (ICCS) for Hg (7470/7471) included in lab package?			X	
1) Analyzed immediately after initial calibration? If no, reject (R) data.			X	
2) %R criteria met? (90-110%). If no, J positive results for affected analyte(s) if %R between 80-89% and 111-120% and indicate bias; UJ non-detect results for affected analyte(s) if %R between 80-89% , and R all data for affected analyte(s) if %R 120%.			X	
3) Spot check ICV/ICCS results for several analytes.			X	
Continuing Calibration Verification Standard (CCV) for ICP (6010) and Calibration Check Standard (CCS) for Hg (7470/7471) included in Lab Package?			X	
1) Analyzed immediately after each ICV/ICC/CB and after every 10 samples? If no, reject (R) data.			X	
2) CCS and CCV from independent source and at mid-level of calibration curve. If no, reject (R) data.			X	
3) %R criteria met? (90-110%R). If no, J positive results for affected analyte(s) if %R between 80-89% and 111-120% and indicate bias; UJ non-detect results for affected analyte(s) if %R between 80-89% and R all data for affected analyte(s) if %R 120%.			X	
4) Spot check CCV/CCS results for several analytes.			X	
Low Calibration Standard (CRI) included in Lab Package?			X	
1) %R criteria met? - 50-150% for Co, Mn, Zn, by ICP-MS; Pb, Tl by 6010; 70-130% all others. If no, refer to ILM05.4 NJ SOP 5.A.2 for actions.			X	

ITEM	YES	NO	N/A	COMMENTS
Calibration Blanks			X	NA for a Limited Review
1) Analyzed after daily calibration and after each ICV/ICC/CCV/CCS and after every 10 samples? If no, reject (R) data.			X	
2) Absolute value 10xCB result, no qualification.			X	
Method Blank Included in Lab Package?	X			
1) Method blank analyzed with each preparation batch or every SDG, or 1/20 samples? If no, reject (R) data, except no aqueous MB required for FB/EB if only soil samples were analyzed.	X			
2) Method blank analyzed 1/20 samples? If - MB 1/25, J sample results from 21-25; -MB >1/25, R sample results after 25th sample.	X			
3) MB results nondetect? If no, -sample result 3xMB but 10xMB, no qualification.		X		See nonconformance table below
4) Negative MB result reported? If yes, -Positive sample result		X		
Field Blanks/Equipment Blanks Included in Lab Package?	X			FS-FB20140210
1) FB/EB result non-detect? If no, -sample result 3xFB/EB but 10xFB/EB, no qualification.	X			
ICP Interference Check Sample (ICS) included in Lab Package?			X	NA for a Limited Review
1) Analyzed at beginning of analytical run? If no, reject (R) data.			X	
2) %R criteria met? (80-120%) If no, %R>120%, no qualification if sample result non-detect; %R between 121-150%, J positive results, biased high; %R between 50-79%, J/UJ results, biased low; %R150%, reject (R) result			X	
3) Spot check accuracy of %Rs			X	
Matrix Spike/Matrix Spike Duplicate Data Included in Lab Package?	X			
1) MS/MSD %R (75-125%R) and RPD (+20%) criteria met? - %R>125% J positive results for affected analyte(s) for all samples in the same batch/SDG, accept NDs; -%R		X		See nonconformance table below
2) Was a sample spiked at the frequency of 1/batch or 20 samples?	X			
3) Was the MS performed on a site sample?	X			
4) Was the MS performed on a FB/EB or TB? If yes, J all sample data.		X		

ITEM	YES	NO	N/A	COMMENTS
Post Digestion Spike			X	NA for a Limited Review
1) %R criteria met? (75-125%R) - %R>125% J positive results for affected analyte(s) for all samples in the same batch/SDG, accept NDs.; - %R			X	
2) Was the spike performed on a FB/EB or TB? If yes, J all sample data.			X	
3) Was a sample spiked at the frequency of 1/batch or 20 samples?			X	
Laboratory Duplicate Data Included in Lab Package?			X	MS/MSD analyses were performed in lieu of laboratory duplicate analysis.
Aqueous - If RPD is >20% but 5x the QL, estimate (J) results >the QL. - If RPD is >100%, reject R results >/= the QL.- If sample and/or duplicate is the QL, estimate (J) positive results 2x the QL, reject R non-detects and positive results			X	
Soil - If RPD is >35% but 5x the QL, estimate (J) results > the QL. - If RPD is >120%, reject results > the QL. - If sample and/or duplicate is 2x the QL, estimate (J) positive results 4x the QL, reject nondetects and positive results			X	
Was a Laboratory Control Sample (LCS) Included in Lab Package?	X			
1) LCS %R criteria met? (80-120%R). If no, J/UJ all affected analytes(s) for all samples in the same batch/SDG.	X			
2) Was an LCS analyzed at the frequency of 1/batch or 20 samples? If no, J/UJ affected analyte(s) for all samples in the same batch/SDG.	X			
Serial Dilution			X	NA for a Limited Review
1) %D(25xIDL (7000) or >10xIDL (6010) and %D >10% J positive results for affected analyte(s) for all samples in the same batch/SDG, accept NDs.			X	
2) Was the frequency 1/batch or 20 samples?			X	
3) Was a site sample used?			X	
4) Was a FB/EB or TB used? If yes, J all sample data.			X	
5) Spot check accuracy of %Ds.			X	

ITEM	YES	NO	N/A	COMMENTS
Field Duplicate Data included in Lab Package?	X			FS13-22.0-22.5 and FS13-22.0-22.5X
Aqueous - If RPD is >20% but 5x the QL, estimate (J) results > the QL. - If RPD is >100%, reject R results >= the QL. - If sample and/or duplicate is the QL, estimate (J) positive results 2x the QL, reject R non-detects and positive results			X	
Soil - If RPD is >35% but 5x the QL, estimate (J) results > the QL. - If RPD is >120%, reject results > the QL. - If sample and/or duplicate is 2x the QL, estimate (J) positive results 4x the QL, reject nondetects and positive results	X			
Percent Solids data included in Lab Package?	X			
1) %Solids criteria (Reg 2 criteria) met? (>=50%)	X			

Laboratory Blanks

Blank ID	Analyte	Result	QL	Units	Associated Samples
MP77688-MB1	Antimony	2.8	6.0	ug/L	All aqueous samples
MP77674-MB1	Nickel	0.090	4.0	mg/kg	All soil samples

Matrix Spikes

Sample ID	Analyte	Batch	MS % Recovery	MSD % Recovery	Lower Limit	Upper Limit	RPD	RPD Limit
FS13-20.0-20.5	ANTIMONY	MP77674	54.4	53.5	75	125	ok	20
FS13GW-30.0-34.0	CHROMIUM	MP77688	349.0	188.0	75	125	26	20

Data Validation Report

Project:	PPG Garfield Avenue Supplemental Remedial Investigation (GARIS) Forrest Street Groundwater and Soil	
Laboratory:	Accutest, Dayton, NJ	
Laboratory Job No.:	JB59605, JB59605A and JB59605R	
Analysis/Method:	Hexavalent Chromium SW846 3060A/7196 Metals by ICP-AES/ SW846-6010	
Validation Level:	Full (Hexavalent Chromium) Limited (Metals)	
Site Location/Address:	Forrest Street, Jersey City, NJ	
AECOM Project No:	60154801.6001A	
Prepared by:	Paula DiMattei /AECOM	Completed on: 04/15/2014
Reviewed by:	Lisa Krowitz /AECOM	File Name: JB59605_A_R 2014-04-15_DV Report-F

Introduction

The data were reviewed in accordance with the FSP-QAPP and the following NJDEP validation Standard Operating Procedures (SOP):

- NJDEP Office of Data Quality SOP 5.A.10, Rev 3 (September 2009), SOP for Analytical Data Validation of Hexavalent Chromium - for USEPA SW-846 Method 3060A, USEPA SW-846 Method 7196A and USEPA SW-846 Method 7199;
- NJDEP Office of Data Quality SOP 5.A.16, Rev 1 (May 2002), Quality Assurance Data Validation of Analytical Deliverables for Inorganics (based on USEPA SW-846 Methods)

The results of quality control data analyzed with site samples were used to assess the overall reliability of the data. The following qualifiers were used to identify data quality issues:

U: Indicates the analyte was not detected in the sample above the sample reporting limit.

J: Indicates the result was an estimated value; the associated numerical value was an approximate concentration of the analyte in the sample.

UJ: Indicates the analyte was not detected above the reporting limit and the reporting limit was approximate.

R: The sample result was rejected due to serious deficiencies; the presence or absence of the analyte could not be confirmed.

RA: The sample result was rejected but is still considered usable.

Sample Information

The samples listed below were collected by AECOM on February 11, 2014 as part of the PPG Garfield Avenue Supplemental Remedial Investigation (GARIS) Forrest Street Groundwater and Soil sampling at the PPG Forrest Street site, Jersey City, NJ. Only the samples and parameters listed below were validated.

Field ID	Laboratory ID	Matrix	Fraction
FS12-0.0-0.5	JB59605-1	Soil	Hexavalent Chromium
FS12-0.0-0.5	JB59605-1A	Soil	Metals
FS12-0.0-0.5	JB59605-1R	Soil	Hexavalent Chromium
FS12-10.0-10.5	JB59605-8	Soil	Hexavalent Chromium
FS12-10.0-10.5	JB59605-8A	Soil	Metals
FS12-10.0-10.5	JB59605-8R	Soil	Hexavalent Chromium
FS12-12.0-12.5	JB59605-9	Soil	Hexavalent Chromium
FS12-12.0-12.5	JB59605-9A	Soil	Metals
FS12-12.0-12.5	JB59605-9R	Soil	Hexavalent Chromium
FS12-14.0-14.5	JB59605-10	Soil	Hexavalent Chromium
FS12-14.0-14.5	JB59605-10A	Soil	Metals
FS12-14.0-14.5	JB59605-10R	Soil	Hexavalent Chromium
FS12-16.0-16.5	JB59605-11	Soil	Hexavalent Chromium
FS12-16.0-16.5	JB59605-11A	Soil	Metals
FS12-16.0-16.5	JB59605-11R	Soil	Hexavalent Chromium
FS12-18.0-18.5	JB59605-12	Soil	Hexavalent Chromium
FS12-18.0-18.5	JB59605-12A	Soil	Metals
FS12-18.0-18.5	JB59605-12R	Soil	Hexavalent Chromium
FS12-2.0-2.5	JB59605-2	Soil	Hexavalent Chromium
FS12-2.0-2.5	JB59605-2A	Soil	Metals
FS12-2.0-2.5	JB59605-2R	Soil	Hexavalent Chromium
FS12-20.0-20.5	JB59605-14	Soil	Hexavalent Chromium
FS12-20.0-20.5	JB59605-14A	Soil	Metals
FS12-20.0-20.5	JB59605-14R	Soil	Hexavalent Chromium
FS12-22.0-22.5	JB59605-15	Soil	Hexavalent Chromium
FS12-22.0-22.5	JB59605-15A	Soil	Metals
FS12-22.0-22.5	JB59605-15R	Soil	Hexavalent Chromium
FS12-24.0-24.5	JB59605-16	Soil	Hexavalent Chromium
FS12-24.0-24.5	JB59605-16A	Soil	Metals
FS12-24.0-24.5	JB59605-16R	Soil	Hexavalent Chromium
FS12-26.0-26.5	JB59605-17	Soil	Hexavalent Chromium
FS12-26.0-26.5	JB59605-17A	Soil	Metals
FS12-26.0-26.5	JB59605-17R	Soil	Hexavalent Chromium
FS12-28.0-28.5	JB59605-18	Soil	Hexavalent Chromium
FS12-28.0-28.5	JB59605-18A	Soil	Metals

Field ID	Laboratory ID	Matrix	Fraction
FS12-28.0-28.5	JB59605-18R	Soil	Hexavalent Chromium
FS12-30.0-30.5	JB59605-20	Soil	Hexavalent Chromium
FS12-30.0-30.5	JB59605-20A	Soil	Metals
FS12-30.0-30.5	JB59605-20R	Soil	Hexavalent Chromium
FS12-32.0-32.5	JB59605-21	Soil	Hexavalent Chromium
FS12-32.0-32.5	JB59605-21A	Soil	Metals
FS12-32.0-32.5	JB59605-21R	Soil	Hexavalent Chromium
FS12-34.0-34.5	JB59605-22	Soil	Hexavalent Chromium
FS12-34.0-34.5	JB59605-22A	Soil	Metals
FS12-34.0-34.5	JB59605-22R	Soil	Hexavalent Chromium
FS12-4.0-4.5	JB59605-3	Soil	Hexavalent Chromium
FS12-4.0-4.5	JB59605-3A	Soil	Metals
FS12-4.0-4.5	JB59605-3R	Soil	Hexavalent Chromium
FS12-4.0-4.5X (Field Duplicate of FS12-4.0-4.5)	JB59605-4	Soil	Hexavalent Chromium
FS12-4.0-4.5X (Field Duplicate of FS12-4.0-4.5)	JB59605-4A	Soil	Metals
FS12-4.0-4.5X (Field Duplicate of FS12-4.0-4.5)	JB59605-4R	Soil	Hexavalent Chromium
FS12-6.0-6.5	JB59605-5	Soil	Hexavalent Chromium
FS12-6.0-6.5	JB59605-5A	Soil	Metals
FS12-6.0-6.5	JB59605-5R	Soil	Hexavalent Chromium
FS12-8.0-8.5	JB59605-6	Soil	Hexavalent Chromium
FS12-8.0-8.5	JB59605-6A	Soil	Metals
FS12-8.0-8.5	JB59605-6R	Soil	Hexavalent Chromium
FS12GW-10.0-14.0	JB59605-7	Ground Water	Hexavalent Chromium
FS12GW-10.0-14.0	JB59605-7A	Ground Water	Metals
FS12GW-20.0-24.0	JB59605-13	Ground Water	Hexavalent Chromium
FS12GW-20.0-24.0	JB59605-13A	Ground Water	Metals
FS12GW-30.0-34.0	JB59605-19	Ground Water	Hexavalent Chromium
FS12GW-30.0-34.0	JB59605-19A	Ground Water	Metals
FS-FB20140211 (Equipment Blank)	JB59605-24	Aqueous	Hexavalent Chromium
FS-FB20140211 (Equipment Blank)	JB59605-24A	Aqueous	Metals
FSTP1-4.0-4.5	JB59605-23	Soil	Hexavalent Chromium
FSTP1-4.0-4.5	JB59605-23A	Soil	Metals
FSTP1-4.0-4.5	JB59605-23R	Soil	Hexavalent Chromium

The samples were collected following the procedures detailed in the Remedial Investigation Work Plan - Soil for Non-Residential Chromate Chemical Production Waste Sites 114, 132, 133, 135, 137, 143, and 186, Jersey City, New Jersey, or applicable proposal or work plan, and the Field Sampling Plan/Quality Assurance Project Plan for Non-Residential and Residential Chromium Sites Hudson County, New Jersey (December 2011).

General Comments

The data package was complete. Quality control (QC) issues identified during validation are discussed below. Refer to the Target Analyte Summary Hit(s) in Attachment A for a listing of all detected results, qualified results, and associated qualifications, where applicable. The nonconformances for each section discussed below are presented in Attachment B.

Hexavalent Chromium

MS Results

Sample FS12GW-10.0-14.0 (JB59605-7) was selected for the matrix spike (MS) analysis associated with the groundwater samples in this SDG. The MS recovery was 93.3%, which met the quality control (QC) recovery criteria of 85-115%. Qualification of the groundwater data based on spike recoveries was not required.

Sample FS12-2.0-2.5 (JB59605-2) was selected for the soil matrix spike analysis and used for supporting data quality recommendations. The soluble and insoluble MS recoveries from the initial batch were 2.5% and 56.1%, respectively. The soluble and insoluble MS recovery did not meet the QC criteria of 75-125%R. The post digestion spike (PDS) recovery was 58.8% and the pH-adjusted PDS was 52.7%, which did not meet the PDS criteria of 85-115%.

Based on poor MS recoveries, less than 75%R, the MS and associated samples were reanalyzed using Method 7196. The soluble and insoluble matrix spike recoveries from the re-analysis were 47.8% and 91.8%, respectively. The soluble MS recovery did not meet the QC criteria of 75-125%R. The PDS result for the re-analysis batch was recovered at 67.9% and the pH-adjusted PDS was 69.3%, which did not meet the PDS criteria of 85-115%.

Since the soluble and/or insoluble MS recoveries were outside the acceptable QC limit of 75-125%, additional parameters were analyzed to determine if possible matrix interferences could be the cause for the poor matrix spike recoveries. All the soil samples were tested for pH and oxidation reduction potential (ORP) and plotted on an Eh/pH phase diagram chart. From this chart, the source sample for the matrix spike analysis was plotted below the phase change line, indicating reducing potential within the sample matrix, incapable of supporting hexavalent chromium. Analyses for ferrous iron, sulfide screen, and total organic carbon (TOC) were performed on the MS source sample to confirm the oxidizing/reducing potential within the sample matrix. The sulfide screen was reported as nondetect, indicating no reducing agents within the sample matrix; however, the ferrous iron (2.3%) and the TOC results (215,000 mg/kg) were positive, indicating potential reducing agents within the sample matrix.

Since the MS and PDS recoveries from both the initial and reanalysis did not meet the MS QC requirements, but at least one MS recovery was greater than 50%, the highest detected hexavalent chromium result or the nondetect hexavalent chromium result with the lowest reporting limit (RL) was reported for each soil sample. The reported hexavalent chromium results in all the soil samples in this SDG were qualified as estimated (J/UJ) due to the poor MS recoveries.

Laboratory Duplicate Precision

Sample FS12-2.0-2.5 was selected by the laboratory to demonstrate laboratory precision capabilities.

The relative percent difference (RPD) for hexavalent chromium exceeded the QC acceptance RPD in the reanalysis; therefore, the hexavalent chromium results in the soil samples reported from the reanalysis were qualified as estimated (J).

Sample Results

Reported results (flagged B by the laboratory) that were less than the RL, but greater than or equal to the method detection limit (MDL), are approximate values and have been qualified as estimated (J).

Metals

Laboratory Blanks/Equipment Blanks

Method Blank

Chromium and nickel were detected in the method blank (MP77728-MB1) associated with the soil samples in this SDG, at concentrations above the MDLs, but below the RLs. Since the results for chromium and nickel in the associated soil samples were greater than ten times the amount detected in the method blank, no qualifications were required.

Negative instrument drift for thallium was detected in the method blank associated with the aqueous samples in this SDG. The nondetect thallium result for the equipment blank FS-FB20140211 was qualified as estimated (UJ).

MS Results

Sample FS12-2.0-2.5 (JB59605-2A) was selected for the MS analysis associated with the soil samples in this SDG. Sample FS12GW-30.0-34.0 (JB59605-19A) was selected for the MS analysis associated with the groundwater samples in this SDG.

For the MS analysis on sample FS12-2.0-2.5, the recovery of antimony, chromium, and nickel did not meet the QC criteria of 75-125%. The positive and nondetect results for antimony in the associated soil samples were qualified as estimated (J/UJ) with potential low bias. The positive results for nickel in the associated soil samples were qualified as estimated (J) with potential low bias. No qualifications were required for chromium since the spiked sample concentration was greater than four times the matrix spike amount.

Additionally, the MS/MSD RPD criterion of <20% was exceeded for nickel. The positive results for nickel in the associated soil samples were qualified as estimated (J) with potential bias in an unknown direction.

For the MS analysis on sample FS12GW-30.0-34.0, the recovery of chromium did not meet the QC criteria of 75-125%. The positive results for chromium in the associated aqueous samples were qualified as estimated (J) with a potential low bias.

Field Duplicate Results

The field duplicate samples in this SDG were FS12-4.0-4.5 and FS12-4.0-4.5X.

The RPD for the reported vanadium field duplicate results exceeded the QC acceptance RPD of greater than 35%, but less than 120%; therefore, the reported vanadium results in all soil samples in this SDG were qualified as estimated (J).

Sample Results

Reported results (flagged B by the laboratory) that were less than the RL, but greater than or equal to the MDL are approximate values that have been qualified as estimated (J).

Data Quality and Usability

In general, these data appear to be valid and may be used for decision-making purposes. No data were rejected. Qualified results, if applicable, are presented in Attachments A and B.

The hexavalent chromium soil results in this SDG are usable as estimated values with the potential for low bias due to low soluble or insoluble MS and PDS recovery, and since the MS sample matrix appears to be reducing based on the Eh-pH plot and the presence of TOC and ferrous iron. The highest detected hexavalent chromium result or the nondetect hexavalent chromium result with the lowest RL was reported for each soil sample.

The hexavalent chromium results for soil samples qualified due to laboratory duplicate imprecision are usable as estimated values with an unknown directional bias.

The thallium result in the equipment blank is usable as an estimated value with potential low bias due to negative instrument drift.

Sample results for antimony and chromium qualified due to low MS recoveries are usable as estimated values with the potential for low bias.

Sample results for nickel qualified due to high MS/MSD recoveries and poor MS/MSD precision are usable as estimated values with an unknown directional bias.

Sample results for vanadium qualified due to field duplicate imprecision are usable as estimated values with an unknown directional bias.

Sample results reported between the MDL and RL are usable as estimated values with an unknown directional bias.

ATTACHMENTS

Attachment A: Target Analyte Summary Hitlist(s)

Attachment B: Data Validation Report Form

Attachment A

Target Analyte Summary Hitlist(s)

Soil Target Analyte Summary Hit List (Hexavalent Chromium)

Site Name PPG Garfield Avenue Supplemental Remedial Investigation (GARIS) Forrest Street
Sampling Date February 11, 2014
Lab Name/ID Accutest, Dayton, NJ
SDG No JB59605 and JB59605R
Sample Matrix Soil
Trip Blank ID NA
Field Blank ID FS-FB20140211

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
FS12-0.0-0.5	JB59605-1	CHROMIUM (HEXAVALENT)	U	4.5	4.5	0.45	Qualify	18
FS12-10.0-10.5	JB59605-8R	CHROMIUM (HEXAVALENT)	U	0.47B	0.47	0.50	Qualify	8,18,31
FS12-12.0-12.5	JB59605-9R	CHROMIUM (HEXAVALENT)	U	0.84	0.84	0.48	Qualify	8,18
FS12-14.0-14.5	JB59605-10R	CHROMIUM (HEXAVALENT)	U	0.56	0.56	0.45	Qualify	8,18
FS12-16.0-16.5	JB59605-11R	CHROMIUM (HEXAVALENT)	U	0.87	0.87	0.45	Qualify	8,18
FS12-18.0-18.5	JB59605-12R	CHROMIUM (HEXAVALENT)	U	0.90	0.90	0.46	Qualify	8,18
FS12-2.0-2.5	JB59605-2R	CHROMIUM (HEXAVALENT)	U	3.8	3.8	0.54	Qualify	8,18
FS12-20.0-20.5	JB59605-14R	CHROMIUM (HEXAVALENT)	U	0.85	0.85	0.45	Qualify	8,18
FS12-22.0-22.5	JB59605-15R	CHROMIUM (HEXAVALENT)	U	0.73	0.73	0.45	Qualify	8,18
FS12-24.0-24.5	JB59605-16R	CHROMIUM (HEXAVALENT)	U	0.13B	0.13	0.48	Qualify	8,18,31
FS12-26.0-26.5	JB59605-17R	CHROMIUM (HEXAVALENT)	U	0.43B	0.43	0.53	Qualify	8,18,31
FS12-28.0-28.5	JB59605-18R	CHROMIUM (HEXAVALENT)	U	0.23B	0.23	0.47	Qualify	8,18,31
FS12-30.0-30.5	JB59605-20R	CHROMIUM (HEXAVALENT)	U	0.69	0.69	0.49	Qualify	8,18
FS12-32.0-32.5	JB59605-21R	CHROMIUM (HEXAVALENT)	U	0.45B	0.45	0.47	Qualify	8,18,31
FS12-34.0-34.5	JB59605-22R	CHROMIUM (HEXAVALENT)	U	U	U	0.50	Qualify	8,18
FS12-4.0-4.5	JB59605-3	CHROMIUM (HEXAVALENT)	U	0.28B	0.28	0.44	Qualify	18,31
FS12-4.0-4.5X	JB59605-4	CHROMIUM (HEXAVALENT)	U	0.18B	0.18	0.46	Qualify	18,31
FS12-6.0-6.5	JB59605-5R	CHROMIUM (HEXAVALENT)	U	0.73	0.73	0.53	Qualify	8,18

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
FS12-8.0-8.5	JB59605-6	CHROMIUM (HEXAVALENT)	U	0.55	0.55	0.51	Qualify	18
FSTP1-4.0-4.5	JB59605-23R	CHROMIUM (HEXAVALENT)	U	1.4	1.4	0.50	Qualify	8,18

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

NJDEP Laboratory Footnote

1. The value reported is less than or equal to 3x the value in the preparation/reagent blank. It is the policy of NJDEP-DPF SR to negate the reported value due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
2. The value reported is greater than three (3) times but less than ten (10) times the value in the preparation/reagent blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to the preparation/reagent blank contamination. The "B" qualifier alerts the end-user to the presence of this analyte in the preparation/reagent blank.
3. The value reported is less than or equal to three (3) times the value in the trip/field blank. It is the policy of NJDEP-DPF SR to negate the reported value as due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
4. The value reported is greater than three (3) times but less than ten (10) times the value in the trip/field blanks and is considered "real". However, the reported value must be quantitatively qualified "J" due to trip/field blank contamination.
5. The concentration reported by the laboratory is incorrectly calculated.
6. The laboratory failed to report the presence of the analyte in the sample.
7. The reported Hexavalent Chromium value was qualified because the Calibration Check Standard was not within the recovery range (90-110 percent).
8. In the Duplicate Sample Analysis, Hexavalent Chromium fell outside the control limits of ≤ 20 percent for sample results $> 4xRL$ or $+ RL$ for sample results $< 4xRL$. Therefore, the result was qualified.

9. This analyte was rejected because the laboratory performed the Duplicate Analysis on a field blank.
10. The reported value was qualified because the PVS recovery was greater than 115 percent.
11. The reported value was qualified because the PVS recovery was less than 85 percent.
12. The non-detected value was qualified (UJ) because the PVS recovery was less than 85 percent. The possibility of a false negative exists.
13. The reported analyte was qualified because the associated Calibration Blank result was greater than the MDL.
14. The laboratory made a transcription error. No hits were found in the raw data.
15. This analyte is qualified or rejected because the laboratory exceeded the holding time for digestion and/or analysis.
16. The laboratory subtracted the preparation/reagent blank from the sample result. The Reviewer's calculation puts the preparation/reagent blank back into the result.
17. The photocopy is unreadable. Therefore, the QA reviewer cannot read the laboratory's reported concentration result.
18. The reported value was qualified because the predigestion spike recovery was less than 75 %, but greater than 50%.
19. The reported value was qualified because the predigestion spike recovery was greater than 125 percent.
20. The non-detected value was qualified (UJ) because the redigestion spike recovery was less than 75 percent. The possibility of a false negative exists.
21. The reported result was qualified or rejected because the laboratory did not record the pH value(s) of the sample in a laboratory notebook.
22. The reported value was qualified (J/UJ) because the sample moisture content exceeded 50 percent.
23. The sample result was rejected because the soluble and insoluble matrix spike recoveries were less than 50%.
24. The detected sample result was qualified (J) because the incorrect spike concentration was used.

25. The reported sample results were rejected because the predigestion spike recovery was greater than 150 percent.
26. The reported sample results were rejected because the redigestion spike recovery was greater than 150 percent.
27. The reported value was qualified (J) because the redigestion spike recovery was less than 75 percent.
28. The reported value was qualified (J/UJ) because the sample digestion temperature was less than 90C.
29. In the Field Duplicate Sample Analysis, Hexavalent Chromium fell outside the control limits of $\leq 20\%$ for sample results $> 4xRL$ or $+ RL$ for sample results $< 4xRL$. Therefore, the result was qualified.
30. The reported value was qualified as estimated (J/UJ) but the bias is uncertain due to both high and low MS recoveries.
31. The reported result was greater than the MDL but less than the RL and qualified (J) as estimated by the laboratory.
32. The reported value was qualified because the sample replicate precision criterion of $\leq 20\%$ for method 7199 was exceeded.
33. The reported value was qualified (J/UJ) because the laboratory control sample (LCS) recovery was less than 80%.
34. The reported value was qualified (J) because the laboratory control sample (LCS) recovery was greater than 120%.
35. The reported result was qualified because the matrix spike analysis was not performed at the proper frequency.
36. The reported result was qualified because the laboratory duplicate analysis was not performed at the proper frequency.
37. The result was qualified because the cooler temperature upon sample receipt exceeded 6C.
38. The reported value was qualified because the redigestion spike recovery was greater than 125 percent.
39. The reported result was rejected because the laboratory failed to perform the reanalysis due to insufficient sample volume.
40. The reported results was qualified because the laboratory failed to analyze an ending CCB.
41. The reported result was qualified because the laboratory failed to make the proper method specific pH adjustment.

42. The reported result was rejected because the laboratory failed to reanalyze the MS and associated sample(s) due to failed MS recoveries.

Soil Target Analyte Summary Hit List (Metals)

Site Name PPG Garfield Avenue Supplemental Remedial Investigation (GARIS) Forrest Street
Sampling Date February 11, 2014
Lab Name/ID Accutest, Dayton, NJ
SDG No JB59605A
Sample Matrix Soil
Trip Blank ID NA
Field Blank ID FS-FB20140211

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
FS12-0.0-0.5	JB59605-1A	ANTIMONY	U	0.82B	0.82	2.3	Qualify	15,23
FS12-0.0-0.5	JB59605-1A	CHROMIUM	0.15	156	156	1.1		
FS12-0.0-0.5	JB59605-1A	NICKEL	0.17	42.6	42.6	4.6	Qualify	8,16
FS12-0.0-0.5	JB59605-1A	VANADIUM	U	109	109	5.7	Qualify	22
FS12-10.0-10.5	JB59605-8A	ANTIMONY	U	0.49B	0.49	2.6	Qualify	15,23
FS12-10.0-10.5	JB59605-8A	CHROMIUM	0.15	17.4	17.4	1.3		
FS12-10.0-10.5	JB59605-8A	NICKEL	0.17	16.3	16.3	5.2	Qualify	8,16
FS12-10.0-10.5	JB59605-8A	VANADIUM	U	24.5	24.5	6.6	Qualify	22
FS12-12.0-12.5	JB59605-9A	ANTIMONY	U	0.31B	0.31	2.3	Qualify	15,23
FS12-12.0-12.5	JB59605-9A	CHROMIUM	0.15	25.3	25.3	1.2		
FS12-12.0-12.5	JB59605-9A	NICKEL	0.17	16.7	16.7	4.6	Qualify	8,16
FS12-12.0-12.5	JB59605-9A	VANADIUM	U	35.1	35.1	5.8	Qualify	22
FS12-14.0-14.5	JB59605-10A	ANTIMONY	U	0.60B	0.60	2.3	Qualify	15,23
FS12-14.0-14.5	JB59605-10A	CHROMIUM	0.15	23.5	23.5	1.1		
FS12-14.0-14.5	JB59605-10A	NICKEL	0.17	22.1	22.1	4.6	Qualify	8,16
FS12-14.0-14.5	JB59605-10A	VANADIUM	U	31.2	31.2	5.7	Qualify	22
FS12-16.0-16.5	JB59605-11A	ANTIMONY	U	0.60B	0.60	2.2	Qualify	15,23
FS12-16.0-16.5	JB59605-11A	CHROMIUM	0.15	26.4	26.4	1.1		

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
FS12-16.0-16.5	JB59605-11A	NICKEL	0.17	20.2	20.2	4.4	Qualify	8,16
FS12-16.0-16.5	JB59605-11A	VANADIUM	U	30.8	30.8	5.4	Qualify	22
FS12-18.0-18.5	JB59605-12A	ANTIMONY	U	U	U	2.3	Qualify	15
FS12-18.0-18.5	JB59605-12A	CHROMIUM	0.15	16.2	16.2	1.2		
FS12-18.0-18.5	JB59605-12A	NICKEL	0.17	8.8	8.8	4.7	Qualify	8,16
FS12-18.0-18.5	JB59605-12A	VANADIUM	U	23.2	23.2	5.8	Qualify	22
FS12-2.0-2.5	JB59605-2A	ANTIMONY	U	7.2B	7.2	9.7	Qualify	15,23
FS12-2.0-2.5	JB59605-2A	CHROMIUM	0.15	437	437	4.9		
FS12-2.0-2.5	JB59605-2A	NICKEL	0.17	224	224	19	Qualify	8,16
FS12-2.0-2.5	JB59605-2A	THALLIUM	U	1.5B	1.5	4.9	Qualify	23
FS12-2.0-2.5	JB59605-2A	VANADIUM	U	122	122	4.9	Qualify	22
FS12-20.0-20.5	JB59605-14A	ANTIMONY	U	0.28B	0.28	2.3	Qualify	15,23
FS12-20.0-20.5	JB59605-14A	CHROMIUM	0.15	34.1	34.1	1.1		
FS12-20.0-20.5	JB59605-14A	NICKEL	0.17	14.9	14.9	4.5	Qualify	8,16
FS12-20.0-20.5	JB59605-14A	VANADIUM	U	40.0	40.0	5.6	Qualify	22
FS12-22.0-22.5	JB59605-15A	ANTIMONY	U	U	U	2.3	Qualify	15
FS12-22.0-22.5	JB59605-15A	CHROMIUM	0.15	11.3	11.3	1.1		
FS12-22.0-22.5	JB59605-15A	NICKEL	0.17	8.7	8.7	4.6	Qualify	8,16
FS12-22.0-22.5	JB59605-15A	VANADIUM	U	17.1	17.1	5.7	Qualify	22
FS12-24.0-24.5	JB59605-16A	ANTIMONY	U	U	U	2.3	Qualify	15
FS12-24.0-24.5	JB59605-16A	CHROMIUM	0.15	7.4	7.4	1.1		
FS12-24.0-24.5	JB59605-16A	NICKEL	0.17	6.6	6.6	4.6	Qualify	8,16
FS12-24.0-24.5	JB59605-16A	VANADIUM	U	12.0	12.0	5.7	Qualify	22
FS12-26.0-26.5	JB59605-17A	ANTIMONY	U	U	U	2.6	Qualify	15
FS12-26.0-26.5	JB59605-17A	CHROMIUM	0.15	12.4	12.4	1.3		

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
FS12-26.0-26.5	JB59605-17A	NICKEL	0.17	9.7	9.7	5.1	Qualify	8,16
FS12-26.0-26.5	JB59605-17A	NICKEL	0.17	9.7	9.7	5.1	Qualify	8,16
FS12-26.0-26.5	JB59605-17A	THALLIUM	U	0.46B	0.46	1.3	Qualify	23
FS12-26.0-26.5	JB59605-17A	VANADIUM	U	17.1	17.1	6.4	Qualify	22
FS12-28.0-28.5	JB59605-18A	ANTIMONY	U	U	U	2.3	Qualify	15
FS12-28.0-28.5	JB59605-18A	CHROMIUM	0.15	7.7	7.7	1.1		
FS12-28.0-28.5	JB59605-18A	NICKEL	0.17	5.4	5.4	4.5	Qualify	8,16
FS12-28.0-28.5	JB59605-18A	VANADIUM	U	12.1	12.1	5.6	Qualify	22
FS12-30.0-30.5	JB59605-20A	ANTIMONY	U	0.34B	0.34	2.5	Qualify	15,23
FS12-30.0-30.5	JB59605-20A	CHROMIUM	0.15	18.6	18.6	1.2		
FS12-30.0-30.5	JB59605-20A	NICKEL	0.17	6.6	6.6	4.9	Qualify	8,16
FS12-30.0-30.5	JB59605-20A	VANADIUM	U	14.7	14.7	6.1	Qualify	22
FS12-32.0-32.5	JB59605-21A	ANTIMONY	U	U	U	2.3	Qualify	15
FS12-32.0-32.5	JB59605-21A	CHROMIUM	0.15	8.5	8.5	1.1		
FS12-32.0-32.5	JB59605-21A	NICKEL	0.17	4.4B	4.4	4.5	Qualify	8,16,23
FS12-32.0-32.5	JB59605-21A	THALLIUM	U	0.36B	0.36	1.1	Qualify	23
FS12-32.0-32.5	JB59605-21A	VANADIUM	U	11.6	11.6	5.7	Qualify	22
FS12-34.0-34.5	JB59605-22A	ANTIMONY	U	0.31B	0.31	2.5	Qualify	15,23
FS12-34.0-34.5	JB59605-22A	CHROMIUM	0.15	18.7	18.7	1.2		
FS12-34.0-34.5	JB59605-22A	NICKEL	0.17	18.1	18.1	5.0	Qualify	8,16
FS12-34.0-34.5	JB59605-22A	THALLIUM	U	0.36B	0.36	1.2	Qualify	23
FS12-34.0-34.5	JB59605-22A	VANADIUM	U	24.1	24.1	6.2	Qualify	22
FS12-4.0-4.5	JB59605-3A	ANTIMONY	U	1.5B	1.5	2.2	Qualify	15,23
FS12-4.0-4.5	JB59605-3A	CHROMIUM	0.15	15.6	15.6	1.1		
FS12-4.0-4.5	JB59605-3A	NICKEL	0.17	27.6	27.6	4.4	Qualify	8,16

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
FS12-4.0-4.5	JB59605-3A	THALLIUM	U	0.94B	0.94	1.1	Qualify	23
FS12-4.0-4.5	JB59605-3A	VANADIUM	U	40.8	40.8	5.5	Qualify	22
FS12-4.0-4.5X	JB59605-4A	ANTIMONY	U	1.4B	1.4	2.4	Qualify	15,23
FS12-4.0-4.5X	JB59605-4A	CHROMIUM	0.15	11.4	11.4	1.2		
FS12-4.0-4.5X	JB59605-4A	NICKEL	0.17	35.3	35.3	4.8	Qualify	8,16
FS12-4.0-4.5X	JB59605-4A	THALLIUM	U	0.58B	0.58	1.2	Qualify	23
FS12-4.0-4.5X	JB59605-4A	VANADIUM	U	21.5	21.5	5.9	Qualify	22
FS12-6.0-6.5	JB59605-5A	ANTIMONY	U	2.1	2.1	2.0	Qualify	15
FS12-6.0-6.5	JB59605-5A	CHROMIUM	0.15	15.1	15.1	0.98		
FS12-6.0-6.5	JB59605-5A	NICKEL	0.17	30.1	30.1	3.9	Qualify	8,16
FS12-6.0-6.5	JB59605-5A	VANADIUM	U	19.9	19.9	4.9	Qualify	22
FS12-8.0-8.5	JB59605-6A	ANTIMONY	U	0.63B	0.63	2.0	Qualify	15,23
FS12-8.0-8.5	JB59605-6A	CHROMIUM	0.15	21.3	21.3	0.99		
FS12-8.0-8.5	JB59605-6A	NICKEL	0.17	15.4	15.4	4.0	Qualify	8,16
FS12-8.0-8.5	JB59605-6A	VANADIUM	U	29.6	29.6	5.0	Qualify	22
FSTP1-4.0-4.5	JB59605-23A	ANTIMONY	U	2.1B	2.1	2.4	Qualify	15,23
FSTP1-4.0-4.5	JB59605-23A	CHROMIUM	0.15	67.4	67.4	1.2		
FSTP1-4.0-4.5	JB59605-23A	NICKEL	0.17	22.8	22.8	4.7	Qualify	8,16
FSTP1-4.0-4.5	JB59605-23A	THALLIUM	U	0.83B	0.83	1.2	Qualify	23
FSTP1-4.0-4.5	JB59605-23A	VANADIUM	U	33.2	33.2	5.9	Qualify	22

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

NJDEP Laboratory Footnote

1. The value reported is less than or equal to 3x the value in the method blank. It is the policy of NJDEP-DPFSR to negate the reported value due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
2. The value reported is greater than three (3) but less than ten (10) times the value in the method blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to the method blank contamination. The "B" qualifier alerts the end-user to the presence of this analyte in the method blank.
3. The value reported is less than or equal to 3x the value in the trip/field blank. It is the policy of NJDEP-DPFSR to negate the reported value as due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
4. The value reported is greater than 3x but less than ten (10) the value in the trip/field blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to trip/field blank contamination.
5. The concentration reported by the laboratory is incorrectly calculated.
6. The laboratory failed to report the presence of the analyte in the sample.
7. The reported metal value was qualified because the Calibration Verification Standard was not within the recovery range (90-110 percent).
8. In the MS/MSD Sample Analysis, this analyte fell outside the control limits of 20% RPD. Therefore, the result was qualified.
9. This analyte was qualified because the laboratory performed the MS/MSD Analysis on a field blank.
10. The reported analyte was qualified because the associated Calibration Blank result was greater than the MDL.
11. The reported value was qualified because serial dilution analysis was not within QC limit of 10% D.
12. This analyte is rejected because the laboratory exceeded the holding time for digestion and analysis.
13. The laboratory subtracted the method blank from the sample result. The reviewer's calculation has added the method blank result to the reported concentration.

14. The photocopy submitted is illegible. Therefore, the QA reviewer cannot read the laboratory's reported concentration result.
15. The reported or nondetected value was qualified because the MS/MSD spike recovery was less than 75 percent.
16. The reported value was qualified because the MS/MSD spike recovery was greater than 125 percent.
17. The reported value was qualified as estimated (J/UJ) but the bias is uncertain due to both high and low MS recoveries.
18. The reported values were qualified because the laboratory duplicate exceeded 35 percent RPD for results greater than 5X the reporting limit or the absolute difference exceeded two times the reporting limit for sample result less than 5 times the reporting limit.
19. The reported value was qualified because the field duplicate exceeded 35 percent RPD for results greater than 5X the reporting limit or the absolute difference exceeded two times the reporting limit for sample result less than 5 times the reporting limit.
20. The reported value was qualified because the LCS recovery was less than 80 percent.
21. The reported value was qualified because the sample moisture content was greater than 50 percent.
22. The reported value was rejected because the field duplicate absolute difference was greater than 4 times the RL or the RPD was greater than 120%.
23. The reported result was greater than the MDL but less than the RL and qualified (J) as estimated by the laboratory.
24. The field duplicate absolute difference exceeded two times the reporting limit for sample result less than 5 times the reporting limit.
25. The reported value was qualified because the LCS recovery was greater than 120 percent.
26. The result was qualified because of negative instrument drift.

Aqueous Target Analyte Summary Hit List (Metals)

Site Name PPG Garfield Avenue Supplemental Remedial Investigation (GARIS) Forrest Street
Sampling Date February 11, 2014
Lab Name/ID Accutest, Dayton, NJ
SDG No JB59605A
Sample Matrix Groundwater
Trip Blank ID NA
Field Blank ID NA

Field Sample ID	Lab Sample ID	Analyte	Method Blank (ug/L)	Laboratory Sample Result (ug/L)	Validation Sample Result (ug/L)	RL (ug/L)	Quality Assurance Decision	NJDEP Validation Footnote
FS12GW-10.0-14.0	JB59605-7A	CHROMIUM	U	378	378	10	Qualify	15
FS12GW-20.0-24.0	JB59605-13A	CHROMIUM	U	3830	3830	20	Qualify	15
FS12GW-30.0-34.0	JB59605-19A	CHROMIUM	U	4280	4280	100	Qualify	15
FS-FB20140211	JB59605-24A	THALLIUM	-2.0	U	U	10	Qualify	26

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

NJDEP Laboratory Footnote

1. The value reported is less than or equal to 3x the value in the method blank. It is the policy of NJDEP-DPFSR to negate the reported value due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
2. The value reported is greater than three (3) but less than ten (10) times the value in the method blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to the method blank contamination. The "B" qualifier alerts the end-user to the presence of this analyte in the method blank.
3. The value reported is less than or equal to 3x the value in the trip/field blank. It is the policy of NJDEP-DPFSR to negate the reported value as due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
4. The value reported is greater than 3x but less than ten (10) the value in the trip/field blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to trip/field blank contamination.

5. The concentration reported by the laboratory is incorrectly calculated.
6. The laboratory failed to report the presence of the analyte in the sample.
7. The reported metal value was qualified because the Calibration Verification Standard was not within the recovery range (90-110 percent).
8. In the MS/MSD Sample Analysis, this analyte fell outside the control limits of 20% RPD. Therefore, the result was qualified.
9. This analyte was qualified because the laboratory performed the MS/MSD Analysis on a field blank.
10. The reported analyte was qualified because the associated Calibration Blank result was greater than the MDL.
11. The reported value was qualified because serial dilution analysis was not within QC limit of 10% D.
12. This analyte is rejected because the laboratory exceeded the holding time for digestion and analysis.
13. The laboratory subtracted the method blank from the sample result. The reviewer's calculation has added the method blank result to the reported concentration.
14. The photocopy submitted is illegible. Therefore, the QA reviewer cannot read the laboratory's reported concentration result.
15. The reported or nondetected value was qualified because the MS/MSD spike recovery was less than 75 percent.
16. The reported value was qualified because the MS/MSD spike recovery was greater than 125 percent.
17. The reported value was qualified as estimated (J/UJ) but the bias is uncertain due to both high and low MS recoveries.
18. The reported values were qualified because the laboratory duplicate exceeded 35 percent RPD for results greater than 5X the reporting limit or the absolute difference exceeded two times the reporting limit for sample result less than 5 times the reporting limit.
19. The reported value was qualified because the field duplicate exceeded 35 percent RPD for results greater than 5X the reporting limit or the absolute difference exceeded two times the reporting limit for sample result less than 5 times the reporting limit.
20. The reported value was qualified because the LCS recovery was less than 80 percent.
21. The reported value was qualified because the sample moisture content was greater than 50 percent.

22. The reported value was rejected because the field duplicate absolute difference was greater than 4 times the RL or the RPD was greater than 120%.
23. The reported result was greater than the MDL but less than the RL and qualified (J) as estimated by the laboratory.
24. The field duplicate absolute difference exceeded two times the reporting limit for sample result less than 5 times the reporting limit.
25. The reported value was qualified because the LCS recovery was greater than 120 percent.
26. The result was qualified because of negative instrument drift.

Attachment B

Data Validation Report Form

Client Name: PPG Industries	Project Number: 60154801.6001A
Site Location: PPG Garfield Avenue Supplemental Remedial Investigation (GARIS) Forrest Street Groundwater and Soil, Jersey City, NJ	Project Manager: William Spronz
Laboratory: Accutest, Dayton, NJ	Type of Validation: Full
Laboratory Job No: JB59605 and JB59605R	Date Checked: 4/15/14
Validator: Paula DiMattei	Peer: Lisa Krowitz

ITEM	YES	NO	N/A	COMMENTS
Sample results included?	X			
Reporting Limits met project requirements?	X			
Field I.D. included?	X			
Laboratory I.D. included?	X			
Sample matrix included?	X			
Sample receipt temperature 2-6C?	X			
Signed COCs included?	X			
Date of sample collection included?	X			
Date of sample digestion included?	X			
Holding time to digestion met criteria? (Soils -30 days from collection to digestion.)	X			
Date of analysis included?	X			
Holding time to analysis met criteria? (Soils -168 hours from digestion to analysis; Aqueous - 24 hours from collection to analysis.)	X			
Method reference included?	X			
Laboratory Case Narrative included?	X			

Definitions: MDL Method Detection Limit; %R Percent Recovery; RL Reporting Limit; RPD Relative Percent Difference; RSD Relative Standard Deviation :Corr Correlation Coefficient.

ITEM	YES	NO	N/A	COMMENTS
Initial calibration documentation included in lab package?	X			
1) Blank plus 4 standards (7196A) or blank plus 3 standards (7199)	X			
2) Correlation coefficient of =0.995 (7196A) or =0.999 (7199)	X			
3) Calibrate daily or each time instrument is set up.	X			
Calibration Check Standard (CCS) for 7196A and Quality Control Sample (QCS) for 7199 Included in Lab Package?	X			
1) %R criteria met? (90 - 110%)	X			
2) Correct frequency of one per every 10 samples	X			
3) CCS and QCS from independent source and at mid-level of calibration curve	X			
Calibration Blanks	X			
1) Analyzed prior to initial calibration standards and after each CCS/QCS?	X			
2) Absolute value should not exceed MDL.	X			
Method Blank, Field Blanks and/or Equipment Blanks Included in Lab Package?	X			FS-FB20140211
1) Method blank analyzed with each preparation batch?	X			
2) Absolute value should not exceed MDL.	X			
Eh and pH Data	X			
1) Eh and pH data was included and plotted for all samples?	X			
Soluble Matrix Spike Data Included in Lab Package?	X			
1) Soluble Matrix %R criteria met? (75-125%R).		X		See nonconformance table below.
2) Was the spike concentration 40 mg/Kg or twice the sample concentration?	X			
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	X			
Insoluble Matrix Spike Data Included in Lab Package?	X			
1) Insoluble Matrix %R criteria met? (75-125%R).		X		See nonconformance table below.
2) Was the spike concentration around 400 to 800 mg/Kg?		X		Spiked at 1080 mg/kg and 1570 mg/kg. No impact to data.
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	X			

ITEM	YES	NO	N/A	COMMENTS
Post Digestion Spike	X			
1) Post Digestion Spike %R criteria met? (85-115%R).		X		See nonconformance table below.
2) Was the spike concentration 40 mg/Kg or twice the sample concentration?	X			
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	X			
Sample Duplicate Data Included in Lab Package?	X			
1) RPD criteria met? (RPD ≤20%) if both results are ≤4x RL or absolute difference ≤RL if either or both results are <4xRL.		X		See nonconformance table below.
2) Was a sample duplicate analyzed at the frequency of 1 per batch or 20 samples?	X			
Was a Laboratory Control Sample (LCS) Included in Lab Package?	X			
1) %R criteria met? (80-120%R).	X			
2) Was an LCS analyzed at the frequency of 1/batch or 20 samples?	X			
Were any Field Duplicate samples submitted with this SDG?	X			FS12-4.0-4.5 and FS12-4.0-4.5X
1) Were Field duplicate RPD criteria met? (RPD≤20% for both sample results >4xRL or absolute difference ≤ RL if either or both results are <4xRL.	X			
Were all sample quantitation and reporting requirements met?	X			
1) Were all solid samples reported with percent solids > 50% ?	X			
2) Were any samples analyzed or reported with dilutions?		X		
Miscellaneous Items	X			
1) For soils by 7196A, was the pH within a range of 7.0-8.0?	X			
2) For soils by 7199, was the pH within a range of 9.0-9.5?			X	
3) For aqueous by 7196A, was the pH with a range of 1.5-2.5?	X			
4) For soils (3060A), was the digestion temperature 90-95C for at least 60 minutes?	X			
5) For 7199, was each sample injected twice and was the RPD =20?			X	

Matrix Spikes

Sample ID	Analyte	Analysis Batch	Matrix Spike	% Recovery	Lower Limit	Upper Limit	PDS	pH-adjusted PDS	PDS Limit
FS12-2.0-2.5	CHROMIUM (HEXAVALENT)	GP77924/GN99623	Soluble	2.5	75	125	58.8	52.7	85-115
FS12-2.0-2.5	CHROMIUM (HEXAVALENT)	GP77924/GN99623	Insoluble	56.1	75	125			
FS12-2.0-2.5	CHROMIUM (HEXAVALENT)	GP78060/GN59	Soluble	47.8	75	125	67.9	69.3	85-115
FS12-2.0-2.5	CHROMIUM (HEXAVALENT)	GP78060/GN59	Insoluble	91.8	75	125			

Lab Duplicates

Sample ID	Duplicate ID	Compound	Sample Result	Qual	Duplicate Result	Qual	QL	Units	RPD
FS12-2.0-2.5	ACTDJB59605R201402270956005	CHROMIUM (HEXAVALENT)	3.8		7.5		0.54	mg/kg	65.5

SDG#: JB59605
Batch: GN99623
 Cr+6 ICAL 02/18/14
 Soil
 (p. 97 of data pkg)

x - concentration	y - response
0	0
0.01	0.008
0.05	0.045
0.1	0.093
0.3	0.26
0.5	0.435
0.8	0.692
1	0.89

(p. 97 of data pkg)

AECOM Calculated Intercept	-0.0005	OK	Reported intercept	-0.0005
AECOM Slope	0.8793	OK	Reported Slope	0.8793
AECOM Calculated r	0.99981	OK	Reported r	0.99981

LCS calculation

GP77924-B1 pgs. 97

Background Absorbance	0
Total absorbance	0.845
Total absorbance - background	0.845
Instrument Concentration	0.962
Sample weight (mg/kg)	0.0025
Final Volume (L)	0.1
Dilution Factor	1

AECOM Calculated LCS Result (mg/Kg)	38.5	OK	Reported Result (mg/Kg)	38.5
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%R = Found/True*100

p. 61

True Value (mg/kg)	40
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AECOM Calculated %R	96.2	OK rounding	Reported %R	96.3
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MS calculation

JB59605-2 [FS12-2.0-2.5] pg. 97

Background reading	0
Total absorbance	0.2
Total absorbance - background	0.2
Instrument Concentration	0.2280
Sample weight (mg/kg)	0.00252
Final Volume (L)	0.1
Percent solids	0.745
Dilution Factor	50

AECOM Calculated MS Result (mg/Kg)	607	OK	Reported Result (mg/Kg)	607
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%R = Found/True*100

JB59605-2 [FS12-2.0-2.5] pg. 63

True Value (mg/kg)	1080
Native concentration (mg/Kg)	0.85

AECOM%R	56.1	OK	Reported %R	56.1
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Percent Solids

JB59605-2 [FS12-2.0-2.5] pg. 64

Empty dish weight=	24.82
Wet weight=	31.65
Dry weight=	29.91

AECOM%solids =	74.5	OK	reported %solids=	74.5
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Reporting Limit**JB59605-2 [FS12-2.0-2.5] pg. 14**

Low Standard	0.01
Initial weight (mg/kg)	0.00243
Final volume (L)	0.1
Percent solids	0.745
Dilution Factor	1

Reporting Limit	0.55	OK rounding	Reported RL (mg/Kg)=	0.54
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Sample Calculations**JB59605-2 [FS12-2.0-2.5] pg. 14, 97**

Background reading	0.016
Total absorbance	0.029
Total absorbance - background	0.013
Instrument Response	0.015
Sample weight (mg/kg)	0.00243
Final Volume (L)	0.1
Percent solids	0.745
Dilution Factor	1

AECOM Calculated Result (mg/Kg)	0.85	OK	Reported Result (mg/Kg)	0.85
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JB59605-1 [FS12-0.0-0.5] pg. 13, 97

Background reading	0.003
Total absorbance	0.091
Total absorbance - background	0.088
Instrument Response	0.101
Sample weight (mg/kg)	0.00253
Final Volume (L)	0.1
Percent solids	0.892
Dilution Factor	1

AECOM Calculated Result (mg/Kg)	4.5	OK	Reported Result (mg/Kg)	4.5
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Client Name: PPG Industries	Project Number: 60154801.6001A
Site Location: PPG Garfield Avenue Supplemental Remedial Investigation (GARIS) Forrest Street Groundwater and Soil, Jersey City, NJ	Project Manager: William Spronz
Laboratory: Accutest, Dayton, NJ	Type of Validation: Limited
Laboratory Job No: JB59605A	Date Checked: 4/15/14
Validator: Paula DiMattei	Peer: Lisa Krowitz

ITEM	YES	NO	N/A	COMMENTS
Sample results included?	X			
Reporting Limits met project requirements?	X			
Field I.D. included?	X			
Laboratory I.D. included?	X			
Sample matrix included?	X			
Sample receipt temperature 2-6C?	X			
Signed COCs included?	X			
Date of sample collection included?	X			
Date of sample digestion included?	X			
Date of analysis included?	X			
Holding time met QC criteria? (Metals -180 days from sample collection; Mercury - 28 days from sample collection. If HT exceeded by 10 days R all results.	X			
Method reference included?	X			
Laboratory Case Narrative included?	X			

Definitions: MDL Method Detection Limit; %R Percent Recovery; RL Reporting Limit; RPD Relative Percent Difference; RSD Relative Standard Deviation ;Corr Correlation Coefficient.

ITEM	YES	NO	N/A	COMMENTS
Sample dilutions?	X			
Initial calibration documentation included in lab package?			X	NA for a Limited Review
1) Calibrate daily or each time instrument is set up.			X	
2) ICP (6010) -Blank plus 1 standard? If no, reject (R) data.			X	
3) Hg (7470/7471) -Blank plus 5 standards? If no, reject (R) data.			X	
Initial Calibration Verification Standard (ICV) for ICP (6010) and Initial Calibration Check Standard (ICCS) for Hg (7470/7471) included in lab package?			X	
1) Analyzed immediately after initial calibration? If no, reject (R) data.			X	
2) %R criteria met? (90-110%). If no, J positive results for affected analyte(s) if %R between 80-89% and 111-120% and indicate bias; UJ non-detect results for affected analyte(s) if %R between 80-89% , and R all data for affected analyte(s) if %R 120%.			X	
3) Spot check ICV/ICCS results for several analytes.			X	
Continuing Calibration Verification Standard (CCV) for ICP (6010) and Calibration Check Standard (CCS) for Hg (7470/7471) included in Lab Package?			X	
1) Analyzed immediately after each ICV/ICC/CB and after every 10 samples? If no, reject (R) data.			X	
2) CCS and CCV from independent source and at mid-level of calibration curve. If no, reject (R) data.			X	
3) %R criteria met? (90-110%R). If no, J positive results for affected analyte(s) if %R between 80-89% and 111-120% and indicate bias; UJ non-detect results for affected analyte(s) if %R between 80-89% and R all data for affected analyte(s) if %R 120%.			X	
4) Spot check CCV/CCS results for several analytes.			X	
Low Calibration Standard (CRI) included in Lab Package?			X	
1) %R criteria met? - 50-150% for Co, Mn, Zn, by ICP-MS; Pb, Tl by 6010; 70-130% all others. If no, refer to ILM05.4 NJ SOP 5.A.2 for actions.			X	

ITEM	YES	NO	N/A	COMMENTS
Calibration Blanks			X	NA for a Limited Review
1) Analyzed after daily calibration and after each ICV/ICC/CCV/CCS and after every 10 samples? If no, reject (R) data.			X	
2) Absolute value 10xCB result, no qualification.			X	
Method Blank Included in Lab Package?	X			
1) Method blank analyzed with each preparation batch or every SDG, or 1/20 samples? If no, reject (R) data, except no aqueous MB required for FB/EB if only soil samples were analyzed.	X			
2) Method blank analyzed 1/20 samples? If - MB 1/25, J sample results from 21-25; -MB >1/25, R sample results after 25th sample.	X			
3) MB results nondetect? If no, -sample result 3xMB but 10xMB, no qualification.		X		See nonconformance table below.
4) Negative MB result reported? If yes, -Positive sample result	X			
Field Blanks/Equipment Blanks Included in Lab Package?	X			FS-FB20140211
1) FB/EB result non-detect? If no, -sample result 3xFB/EB but 10xFB/EB, no qualification.	X			
ICP Interference Check Sample (ICS) included in Lab Package?			X	NA for a Limited Review
1) Analyzed at beginning of analytical run? If no, reject (R) data.			X	
2) %R criteria met? (80-120%) If no, %R>120%, no qualification if sample result non-detect; %R between 121-150%, J positive results, biased high; %R between 50-79%, J/UJ results, biased low; %R150%, reject (R) result			X	
3) Spot check accuracy of %Rs			X	
Matrix Spike/Matrix Spike Duplicate Data Included in Lab Package?	X			
1) MS/MSD %R (75-125%R) and RPD (+20%) criteria met? - %R>125% J positive results for affected analyte(s) for all samples in the same batch/SDG, accept NDs; -%R		X		See nonconformance table below.
2) Was a sample spiked at the frequency of 1/batch or 20 samples?	X			
3) Was the MS performed on a site sample?	X			
4) Was the MS performed on a FB/EB or TB? If yes, J all sample data.		X		

ITEM	YES	NO	N/A	COMMENTS
Post Digestion Spike			X	NA for a Limited Review
1) %R criteria met? (75-125%R) - %R>125% J positive results for affected analyte(s) for all samples in the same batch/SDG, accept NDs.; - %R			X	
2) Was the spike performed on a FB/EB or TB? If yes, J all sample data.			X	
3) Was a sample spiked at the frequency of 1/batch or 20 samples?			X	
Laboratory Duplicate Data Included in Lab Package?		X		MS/MSD analyses were performed in lieu of a laboratory duplicate analysis.
Aqueous - If RPD is >20% but 5x the QL, estimate (J) results >the QL. - If RPD is >100%, reject R results >= the QL.- If sample and/or duplicate is the QL, estimate (J) positive results 2x the QL, reject R non-detects and positive results			X	
Soil - If RPD is >35% but 5x the QL, estimate (J) results > the QL. - If RPD is >120%, reject results > the QL. - If sample and/or duplicate is 2x the QL, estimate (J) positive results 4x the QL, reject nondetects and positive results			X	
Was a Laboratory Control Sample (LCS) Included in Lab Package?	X			
1) LCS %R criteria met? (80-120%R). If no, J/UJ all affected analytes(s) for all samples in the same batch/SDG.	X			
2) Was an LCS analyzed at the frequency of 1/batch or 20 samples? If no, J/UJ affected analyte(s) for all samples in the same batch/SDG.	X			
Serial Dilution			X	NA for a Limited Review
1) %D(25xIDL (7000) or >10xIDL (6010) and %D >10% J positive results for affected analyte(s) for all samples in the same batch/SDG, accept NDs.			X	
2) Was the frequency 1/batch or 20 samples?			X	
3) Was a site sample used?			X	
4) Was a FB/EB or TB used? If yes, J all sample data.			X	
5) Spot check accuracy of %Ds.			X	
Field Duplicate Data included in Lab Package?	X			
Aqueous - If RPD is >20% but 5x the QL, estimate (J) results > the QL. - If RPD is >100%, reject R results >= the QL. - If sample and/or duplicate is the QL, estimate (J) positive results 2x the QL, reject R non-detects and positive results			X	

ITEM	YES	NO	N/A	COMMENTS
Soil - If RPD is >35% but 5x the QL, estimate (J) results > the QL. - If RPD is >120%, reject results > the QL. - If sample and/or duplicate is 2x the QL, estimate (J) positive results 4x the QL, reject nondetects and positive results	X			See nonconformance table below.
Percent Solids data included in Lab Package?	X			
1) %Solids criteria (Reg 2 criteria) met? (>=50%)	X			

Laboratory Blanks

Blank ID	Analyte	Result	QL	Units	Associated Samples
MP77728-MB1	Chromium	0.15	0.97	mg/kg	All soil samples
MP77728-MB1	Nickel	0.17	3.9	mg/kg	
MP77721-MB1	Thallium	-2.0	2.0	ug/L	All aqueous samples

Matrix Spikes

Sample ID	Analyte	Batch	MS % Recovery	MSD % Recovery	Lower Limit	Upper Limit	RPD	RPD Limit
FS12-2.0-2.5	Antimony	MP77728	63.3	60.1	75	125	ok	20
FS12-2.0-2.5	Nickel	MP77728	213.8	ok	75	125	35.7	20
FS12GW-30.0-34.0	Chromium	MP77721	69.5	32.5	75	125	ok	20

Field Duplicates

Sample ID	Duplicate ID	Analyte	Sample Result	Qual	Duplicate Result	Qual	QL	Units	RPD
FS12-4.0-4.5	FS12-4.0-4.5X	Vanadium	40.8		21.5		5.5	mg/kg	62

Data Validation Report

Project:	PPG Garfield Avenue Supplemental Remedial Investigation (GARIS) Forrest Street Groundwater and Soil	
Laboratory:	Accutest, Dayton, NJ	
Laboratory Job No.:	JB59711 and JB59711A	
Analysis/Method:	Hexavalent Chromium SW846 3060A/7196 Metals by ICP-AES/ SW846-6010	
Validation Level:	Full (Hexavalent Chromium) Limited (Metals)	
Site Location/Address:	Forrest Street, Jersey City, NJ	
AECOM Project No:	60154801.6001A	
Prepared by:	Paula DiMattei /AECOM	Completed on: 04/16/2014
Reviewed by:	Lisa Krowitz /AECOM	File Name: JB59711_A_2014-04-16_DV Report-F

Introduction

The data were reviewed in accordance with the FSP-QAPP and the following NJDEP validation Standard Operating Procedures (SOP):

- NJDEP Office of Data Quality SOP 5.A.10, Rev 3 (September 2009), SOP for Analytical Data Validation of Hexavalent Chromium - for USEPA SW-846 Method 3060A, USEPA SW-846 Method 7196A and USEPA SW-846 Method 7199;
- NJDEP Office of Data Quality SOP 5.A.16, Rev 1 (May 2002), Quality Assurance Data Validation of Analytical Deliverables for Inorganics (based on USEPA SW-846 Methods)

The results of quality control data analyzed with site samples were used to assess the overall reliability of the data. The following qualifiers were used to identify data quality issues:

- U: Indicates the analyte was not detected in the sample above the sample reporting limit.
- J: Indicates the result was an estimated value; the associated numerical value was an approximate concentration of the analyte in the sample.
- UJ: Indicates the analyte was not detected above the reporting limit and the reporting limit was approximate.
- R: The sample result was rejected due to serious deficiencies; the presence or absence of the analyte could not be confirmed.
- RA: The sample result was rejected but is still considered usable.

Sample Information

The samples listed below were collected by AECOM on February 12, 2014 as part of the PPG Garfield Avenue Supplemental Remedial Investigation (GARIS) Forrest Street Groundwater and Soil sampling at the PPG Forrest Street, Jersey City, NJ. Only the samples and parameters listed below were validated.

Field ID	Laboratory ID	Matrix	Fraction
FS11-0.0-0.5	JB59711-1	Soil	Hexavalent Chromium
FS11-0.0-0.5	JB59711-1A	Soil	Metals
FS11-10.0-10.5	JB59711-7	Soil	Hexavalent Chromium
FS11-10.0-10.5	JB59711-7A	Soil	Metals
FS11-12.0-12.5	JB59711-8	Soil	Hexavalent Chromium
FS11-12.0-12.5	JB59711-8A	Soil	Metals
FS11-14.0-14.5	JB59711-9	Soil	Hexavalent Chromium
FS11-14.0-14.5	JB59711-9A	Soil	Metals
FS11-16.0-16.5	JB59711-10	Soil	Hexavalent Chromium
FS11-16.0-16.5	JB59711-10A	Soil	Metals
FS11-18.0-18.5	JB59711-11	Soil	Hexavalent Chromium
FS11-18.0-18.5	JB59711-11A	Soil	Metals
FS11-2.0-2.5	JB59711-2	Soil	Hexavalent Chromium
FS11-2.0-2.5	JB59711-2A	Soil	Metals
FS11-20.0-20.5	JB59711-15	Soil	Hexavalent Chromium
FS11-20.0-20.5	JB59711-15A	Soil	Metals
FS11-22.0-22.5	JB59711-16	Soil	Hexavalent Chromium
FS11-22.0-22.5	JB59711-16A	Soil	Metals
FS11-24.0-24.5	JB59711-17	Soil	Hexavalent Chromium
FS11-24.0-24.5	JB59711-17A	Soil	Metals
FS11-26.0-26.5	JB59711-19	Soil	Hexavalent Chromium
FS11-26.0-26.5	JB59711-19A	Soil	Metals
FS11-28.0-28.5	JB59711-20	Soil	Hexavalent Chromium
FS11-28.0-28.5	JB59711-20A	Soil	Metals
FS11-30.0-30.5	JB59711-21	Soil	Hexavalent Chromium
FS11-30.0-30.5	JB59711-21A	Soil	Metals
FS11-32.0-32.5	JB59711-22	Soil	Hexavalent Chromium
FS11-32.0-32.5	JB59711-22A	Soil	Metals
FS11-34.0-34.5	JB59711-23	Soil	Hexavalent Chromium
FS11-34.0-34.5	JB59711-23A	Soil	Metals
FS11-4.0-4.5	JB59711-3	Soil	Hexavalent Chromium
FS11-4.0-4.5	JB59711-3A	Soil	Metals
FS11-6.0-6.5	JB59711-4	Soil	Hexavalent Chromium
FS11-6.0-6.5	JB59711-4A	Soil	Metals
FS11-8.0-8.5	JB59711-5	Soil	Hexavalent Chromium

Field ID	Laboratory ID	Matrix	Fraction
FS11-8.0-8.5	JB59711-5A	Soil	Metals
FS11GW-10.0-14.0	JB59711-6	Ground Water	Hexavalent Chromium
FS11GW-10.0-14.0	JB59711-6A	Ground Water	Metals
FS11GW-20.0-24.0	JB59711-12	Ground Water	Hexavalent Chromium
FS11GW-20.0-24.0	JB59711-12A	Ground Water	Metals
FS11GW-30.0-34.0	JB59711-18	Ground Water	Hexavalent Chromium
FS11GW-30.0-34.0	JB59711-18A	Ground Water	Metals
FS11GW-40.0-44.0	JB59711-24	Ground Water	Hexavalent Chromium
FS11GW-40.0-44.0	JB59711-24A	Ground Water	Metals
FS12-36.0-36.5	JB59711-26	Soil	Hexavalent Chromium
FS12-36.0-36.5	JB59711-26A	Soil	Metals
FS12-38.0-38.5	JB59711-27	Soil	Hexavalent Chromium
FS12-38.0-38.5	JB59711-27A	Soil	Metals
FS12-38.0-38.5X (Field Duplicate of FS12-38.0-38.5)	JB59711-28	Soil	Hexavalent Chromium
FS12-38.0-38.5X (Field Duplicate of FS12-38.0-38.5)	JB59711-28A	Soil	Metals
FS12-40.0-40.5	JB59711-30	Soil	Hexavalent Chromium
FS12-40.0-40.5	JB59711-30A	Soil	Metals
FS12GW-40.0-44.0	JB59711-29	Ground Water	Hexavalent Chromium
FS12GW-40.0-44.0	JB59711-29A	Ground Water	Metals
FS-FB20140212 (Equipment Blank)	JB59711-25	Aqueous	Hexavalent Chromium
FS-FB20140212 (Equipment Blank)	JB59711-25A	Aqueous	Metals
FSTP1-5.2-5.7	JB59711-13	Soil	Hexavalent Chromium
FSTP1-5.2-5.7	JB59711-13A	Soil	Metals
FSTP1-7.1-7.6	JB59711-14	Soil	Hexavalent Chromium
FSTP1-7.1-7.6	JB59711-14A	Soil	Metals

The samples were collected following the procedures detailed in the Remedial Investigation Work Plan - Soil for Non-Residential Chromate Chemical Production Waste Sites 114, 132, 133, 135, 137, 143, and 186, Jersey City, New Jersey, or applicable proposal or work plan, and the Field Sampling Plan/Quality Assurance Project Plan for Non-Residential and Residential Chromium Sites Hudson County, New Jersey (December 2011).

General Comments

The data package was complete. Quality control (QC) issues identified during validation are discussed below. Refer to the Target Analyte Summary Hit(s) in Attachment A for a listing of all detected results, qualified results, and associated qualifications, where applicable. The nonconformances for each section discussed below are presented in Attachment B.

Hexavalent Chromium

MS Results

There were two soil matrix spike (MS) samples [FS11-14.0-14.5 (JB59711-9) and FS11-28.0-28.5 (JB59711-20)], and one groundwater MS sample [FS11GW-10.0-14.0 (JB59711-6)] associated with the samples in this SDG that were used for supporting data quality recommendations.

For the MS on soil sample FS11-14.0-14.5, the soluble and insoluble MS recoveries were 90.9% and 94.4%, respectively; which met the quality control (QC) criteria of 75-125%. The post digestion spike (PDS) recovery was 98.9%, which met the PDS criteria of 85-115%. No data qualification was required on the basis of spike recoveries.

For the MS on soil sample FS11-28.0-28.5, the soluble and insoluble MS recoveries were 92.9% and 95.1%, respectively; which met the QC criteria of 75-125%. The PDS recovery was 104%, which met the PDS criteria of 85-115%. No data qualification was required on the basis of spike recoveries.

For the MS on aqueous sample FS11GW-10.0-14.0, the MS recovery was 100.1%; which met the QC criteria of 85-115%. No data qualification was required on the basis of this spike recovery.

Sample Results

Reported results (flagged B by the laboratory) that were less than the reporting limit (RL), but greater than or equal to the method detection limit (MDL) are approximate values and have been qualified as estimated (J).

Metals

Laboratory Blanks/Equipment Blanks

Method Blank

Antimony was detected in the method blank (MP77750-MB1) associated with the aqueous samples in this SDG, at a concentration above the MDL, but below the RL. Since antimony was not detected in the associated samples, no actions were required on this basis.

MS Results

Sample FS11-28.0-28.5 (JB59711-20A) was the site sample used for the MS analysis of one soil preparation batch associated with the Method 6010 analysis of the soil samples in this SDG. The laboratory provided batch QC for the remaining soil sample batch and for the aqueous samples. The batch QC was not assessed.

For the MS analysis on sample FS11-28.0-28.5, the recovery of antimony did not meet the QC criteria of 75-125%. The positive and nondetect results for antimony in all soil samples were qualified as estimated (J/UJ) with potential low bias.

Sample Results

Reported results (flagged B by the laboratory) that were less than the reporting limit (RL), but greater than or equal to the method detection limit (MDL) are approximate values that have been qualified as estimated (J).

Data Quality and Usability

In general, these data appear to be valid and may be used for decision-making purposes. No data were rejected. Qualified results, if applicable, are presented in Attachments A and B.

Sample results for antimony qualified due to low MS recoveries are usable as estimated values with the potential for low bias.

Sample results reported between the MDL and RL are usable as estimated values with an unknown directional bias.

ATTACHMENTS

Attachment A: Target Analyte Summary Hitlist(s)

Attachment B: Data Validation Report Form

Attachment A

Target Analyte Summary Hitlist(s)

Soil Target Analyte Summary Hit List (Hexavalent Chromium)

Site Name PPG Garfield Avenue Supplemental Remedial Investigation (GARIS) Forrest Street
Sampling Date February 12, 2014
Lab Name/ID Accutest, Dayton, NJ
SDG No JB59711
Sample Matrix Soil
Trip Blank ID NA
Field Blank ID FS-FB20140212

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
FS11-0.0-0.5	JB59711-1	CHROMIUM (HEXAVALENT)	U	0.47	0.47	0.45		
FS11-10.0-10.5	JB59711-7	CHROMIUM (HEXAVALENT)	U	0.45B	0.45	0.48	Qualify	31
FS11-12.0-12.5	JB59711-8	CHROMIUM (HEXAVALENT)	U	0.096B	0.096	0.46	Qualify	31
FS11-14.0-14.5	JB59711-9	CHROMIUM (HEXAVALENT)	U	0.27B	0.27	0.46	Qualify	31
FS11-18.0-18.5	JB59711-11	CHROMIUM (HEXAVALENT)	U	0.15B	0.15	0.46	Qualify	31
FS11-2.0-2.5	JB59711-2	CHROMIUM (HEXAVALENT)	U	2.3	2.3	0.49		
FS11-20.0-20.5	JB59711-15	CHROMIUM (HEXAVALENT)	U	0.18B	0.18	0.51	Qualify	31
FS11-22.0-22.5	JB59711-16	CHROMIUM (HEXAVALENT)	U	0.33B	0.33	0.50	Qualify	31
FS11-24.0-24.5	JB59711-17	CHROMIUM (HEXAVALENT)	U	0.17B	0.17	0.51	Qualify	31
FS11-26.0-26.5	JB59711-19	CHROMIUM (HEXAVALENT)	U	0.79	0.79	0.52		
FS11-30.0-30.5	JB59711-21	CHROMIUM (HEXAVALENT)	U	1.1	1.1	0.51		
FS11-34.0-34.5	JB59711-23	CHROMIUM (HEXAVALENT)	U	0.11B	0.11	0.49	Qualify	31
FS11-4.0-4.5	JB59711-3	CHROMIUM (HEXAVALENT)	U	0.23B	0.23	0.50	Qualify	31
FS11-6.0-6.5	JB59711-4	CHROMIUM (HEXAVALENT)	U	0.12B	0.12	0.51	Qualify	31
FS11-8.0-8.5	JB59711-5	CHROMIUM (HEXAVALENT)	U	0.29B	0.29	0.51	Qualify	31
FS12-36.0-36.5	JB59711-26	CHROMIUM (HEXAVALENT)	U	0.15B	0.15	0.44	Qualify	31
FS12-38.0-38.5	JB59711-27	CHROMIUM (HEXAVALENT)	U	0.10B	0.10	0.44	Qualify	31
FS12-38.0-38.5X	JB59711-28	CHROMIUM (HEXAVALENT)	U	0.11B	0.11	0.46	Qualify	31

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
FS12-40.0-40.5	JB59711-30	CHROMIUM (HEXAVALENT)	U	0.25B	0.25	0.45	Qualify	31
FSTP1-5.2-5.7	JB59711-13	CHROMIUM (HEXAVALENT)	U	0.60	0.60	0.52		
FSTP1-7.1-7.6	JB59711-14	CHROMIUM (HEXAVALENT)	U	0.24B	0.24	0.52	Qualify	31

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

NJDEP Laboratory Footnote

1. The value reported is less than or equal to 3x the value in the preparation/reagent blank. It is the policy of NJDEP-DPFSR to negate the reported value due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
2. The value reported is greater than three (3) times but less than ten (10) times the value in the preparation/reagent blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to the preparation/reagent blank contamination. The "B" qualifier alerts the end-user to the presence of this analyte in the preparation/reagent blank.
3. The value reported is less than or equal to three (3) times the value in the trip/field blank. It is the policy of NJDEP-DPFSR to negate the reported value as due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
4. The value reported is greater than three (3) times but less than ten (10) times the value in the trip/field blanks and is considered "real". However, the reported value must be quantitatively qualified "J" due to trip/field blank contamination.
5. The concentration reported by the laboratory is incorrectly calculated.
6. The laboratory failed to report the presence of the analyte in the sample.
7. The reported Hexavalent Chromium value was qualified because the Calibration Check Standard was not within the recovery range (90-110 percent).
8. In the Duplicate Sample Analysis, Hexavalent Chromium fell outside the control limits of ≤ 20 percent for sample results $> 4xRL$ or $+ RL$ for sample results $< 4xRL$. Therefore, the result was qualified.

9. This analyte was rejected because the laboratory performed the Duplicate Analysis on a field blank.
10. The reported value was qualified because the PVS recovery was greater than 115 percent.
11. The reported value was qualified because the PVS recovery was less than 85 percent.
12. The non-detected value was qualified (UJ) because the PVS recovery was less than 85 percent. The possibility of a false negative exists.
13. The reported analyte was qualified because the associated Calibration Blank result was greater than the MDL.
14. The laboratory made a transcription error. No hits were found in the raw data.
15. This analyte is qualified or rejected because the laboratory exceeded the holding time for digestion and/or analysis.
16. The laboratory subtracted the preparation/reagent blank from the sample result. The Reviewer's calculation puts the preparation/reagent blank back into the result.
17. The photocopy is unreadable. Therefore, the QA reviewer cannot read the laboratory's reported concentration result.
18. The reported value was qualified because the predigestion spike recovery was less than 75 %, but greater than 50%.
19. The reported value was qualified because the predigestion spike recovery was greater than 125 percent.
20. The non-detected value was qualified (UJ) because the redigestion spike recovery was less than 75 percent. The possibility of a false negative exists.
21. The reported result was qualified or rejected because the laboratory did not record the pH value(s) of the sample in a laboratory notebook.
22. The reported value was qualified (J/UJ) because the sample moisture content exceeded 50 percent.
23. The sample result was rejected because the soluble and insoluble matrix spike recoveries were less than 50%.
24. The detected sample result was qualified (J) because the incorrect spike concentration was used.

25. The reported sample results were rejected because the predigestion spike recovery was greater than 150 percent.
26. The reported sample results were rejected because the redigestion spike recovery was greater than 150 percent.
27. The reported value was qualified (J) because the redigestion spike recovery was less than 75 percent.
28. The reported value was qualified (J/UJ) because the sample digestion temperature was less than 90C.
29. In the Field Duplicate Sample Analysis, Hexavalent Chromium fell outside the control limits of $\leq 20\%$ for sample results $> 4xRL$ or $+ RL$ for sample results $< 4xRL$. Therefore, the result was qualified.
30. The reported value was qualified as estimated (J/UJ) but the bias is uncertain due to both high and low MS recoveries.
31. The reported result was greater than the MDL but less than the RL and qualified (J) as estimated by the laboratory.
32. The reported value was qualified because the sample replicate precision criterion of $\leq 20\%$ for method 7199 was exceeded.
33. The reported value was qualified (J/UJ) because the laboratory control sample (LCS) recovery was less than 80%.
34. The reported value was qualified (J) because the laboratory control sample (LCS) recovery was greater than 120%.
35. The reported result was qualified because the matrix spike analysis was not performed at the proper frequency.
36. The reported result was qualified because the laboratory duplicate analysis was not performed at the proper frequency.
37. The result was qualified because the cooler temperature upon sample receipt exceeded 6C.
38. The reported value was qualified because the redigestion spike recovery was greater than 125 percent.
39. The reported result was rejected because the laboratory failed to perform the reanalysis due to insufficient sample volume.
40. The reported results was qualified because the laboratory failed to analyze an ending CCB.
41. The reported result was qualified because the laboratory failed to make the proper method specific pH adjustment.

42. The reported result was rejected because the laboratory failed to reanalyze the MS and associated sample(s) due to failed MS recoveries.

Aqueous Target Analyte Summary Hit List (Hexavalent Chromium)

Site Name PPG Garfield Avenue Supplemental Remedial Investigation (GARIS) Forrest Street
Sampling Date February 12, 2014
Lab Name/ID Accutest, Dayton, NJ
SDG No JB59711
Sample Matrix Groundwater
Trip Blank ID NA
Field Blank ID NA

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/L)	Laboratory Sample Result (mg/L)	Validation Sample Result (mg/L)	RL (mg/L)	Quality Assurance Decision	NJDEP Validation Footnote
FS11GW-40.0-44.0	JB59711-24	CHROMIUM (HEXAVALENT)	U	0.0021B	0.0021	0.010	Qualify	31

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

NJDEP Laboratory Footnote

1. The value reported is less than or equal to 3x the value in the preparation/reagent blank. It is the policy of NJDEP-DPFSR to negate the reported value due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
2. The value reported is greater than three (3) times but less than ten (10) times the value in the preparation/reagent blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to the preparation/reagent blank contamination. The "B" qualifier alerts the end-user to the presence of this analyte in the preparation/reagent blank.
3. The value reported is less than or equal to three (3) times the value in the trip/field blank. It is the policy of NJDEP-DPFSR to negate the reported value as due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
4. The value reported is greater than three (3) times but less than ten (10) times the value in the trip/field blanks and is considered "real". However, the reported value must be quantitatively qualified "J" due to trip/field blank contamination.
5. The concentration reported by the laboratory is incorrectly calculated.

6. The laboratory failed to report the presence of the analyte in the sample.
7. The reported Hexavalent Chromium value was qualified because the Calibration Check Standard was not within the recovery range (90-110 percent).
8. In the Duplicate Sample Analysis, Hexavalent Chromium fell outside the control limits of ≤ 20 percent for sample results $> 4xRL$ or $+ RL$ for sample results $< 4xRL$. Therefore, the result was qualified.
9. This analyte was rejected because the laboratory performed the Duplicate Analysis on a field blank.
10. The reported value was qualified because the PVS recovery was greater than 115 percent.
11. The reported value was qualified because the PVS recovery was less than 85 percent.
12. The non-detected value was qualified (UJ) because the PVS recovery was less than 85 percent. The possibility of a false negative exists.
13. The reported analyte was qualified because the associated Calibration Blank result was greater than the MDL.
14. The laboratory made a transcription error. No hits were found in the raw data.
15. This analyte is qualified or rejected because the laboratory exceeded the holding time for digestion and/or analysis.
16. The laboratory subtracted the preparation/reagent blank from the sample result. The Reviewer's calculation puts the preparation/reagent blank back into the result.
17. The photocopy is unreadable. Therefore, the QA reviewer cannot read the laboratory's reported concentration result.
18. The reported value was qualified because the predigestion spike recovery was less than 75 %, but greater than 50%.
19. The reported value was qualified because the predigestion spike recovery was greater than 125 percent.
20. The non-detected value was qualified (UJ) because the redigestion spike recovery was less than 75 percent. The possibility of a false negative exists.
21. The reported result was qualified or rejected because the laboratory did not record the pH value(s) of the sample in a laboratory notebook.

22. The reported value was qualified (J/UJ) because the sample moisture content exceeded 50 percent.
23. The sample result was rejected because the soluble and insoluble matrix spike recoveries were less than 50%.
24. The detected sample result was qualified (J) because the incorrect spike concentration was used.
25. The reported sample results were rejected because the predigestion spike recovery was greater than 150 percent.
26. The reported sample results were rejected because the redigestion spike recovery was greater than 150 percent.
27. The reported value was qualified (J) because the redigestion spike recovery was less than 75 percent.
28. The reported value was qualified (J/UJ) because the sample digestion temperature was less than 90C.
29. In the Field Duplicate Sample Analysis, Hexavalent Chromium fell outside the control limits of $\leq 20\%$ for sample results $> 4xRL$ or $+ RL$ for sample results $< 4xRL$. Therefore, the result was qualified.
30. The reported value was qualified as estimated (J/UJ) but the bias is uncertain due to both high and low MS recoveries.
31. The reported result was greater than the MDL but less than the RL and qualified (J) as estimated by the laboratory.
32. The reported value was qualified because the sample replicate precision criterion of $\leq 20\%$ for method 7199 was exceeded.
33. The reported value was qualified (J/UJ) because the laboratory control sample (LCS) recovery was less than 80%.
34. The reported value was qualified (J) because the laboratory control sample (LCS) recovery was greater than 120%.
35. The reported result was qualified because the matrix spike analysis was not performed at the proper frequency.
36. The reported result was qualified because the laboratory duplicate analysis was not performed at the proper frequency.
37. The result was qualified because the cooler temperature upon sample receipt exceeded 6C.
38. The reported value was qualified because the redigestion spike recovery was greater than 125 percent.

39. The reported result was rejected because the laboratory failed to perform the reanalysis due to insufficient sample volume.
40. The reported results was qualified because the laboratory failed to analyze an ending CCB.
41. The reported result was qualified because the laboratory failed to make the proper method specific pH adjustment.
42. The reported result was rejected because the laboratory failed to reanalyze the MS and associated sample(s) due to failed MS recoveries.

Soil Target Analyte Summary Hit List (Metals)

Site Name PPG Garfield Avenue Supplemental Remedial Investigation (GARIS) Forrest Street
Sampling Date February 12, 2014
Lab Name/ID Accutest, Dayton, NJ
SDG No JB59711A
Sample Matrix Soil
Trip Blank ID NA
Field Blank ID FS-FB20140212

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
FS11-0.0-0.5	JB59711-1A	ANTIMONY	U	0.37B	0.37	2.2	Qualify	15,23
FS11-0.0-0.5	JB59711-1A	CHROMIUM	U	27.4	27.4	1.1		
FS11-0.0-0.5	JB59711-1A	NICKEL	U	19.4	19.4	4.3		
FS11-0.0-0.5	JB59711-1A	VANADIUM	U	29.6	29.6	5.4		
FS11-10.0-10.5	JB59711-7A	ANTIMONY	U	U	U	2.4	Qualify	15
FS11-10.0-10.5	JB59711-7A	CHROMIUM	U	17.0	17.0	1.2		
FS11-10.0-10.5	JB59711-7A	NICKEL	U	12.0	12.0	4.8		
FS11-10.0-10.5	JB59711-7A	THALLIUM	U	0.47B	0.47	1.2	Qualify	23
FS11-10.0-10.5	JB59711-7A	VANADIUM	U	31.5	31.5	6.0		
FS11-12.0-12.5	JB59711-8A	ANTIMONY	U	U	U	2.3	Qualify	15
FS11-12.0-12.5	JB59711-8A	CHROMIUM	U	29.4	29.4	1.1		
FS11-12.0-12.5	JB59711-8A	NICKEL	U	18.9	18.9	4.5		
FS11-12.0-12.5	JB59711-8A	VANADIUM	U	26.9	26.9	5.7		
FS11-14.0-14.5	JB59711-9A	ANTIMONY	U	U	U	2.2	Qualify	15
FS11-14.0-14.5	JB59711-9A	CHROMIUM	U	12.7	12.7	1.1		
FS11-14.0-14.5	JB59711-9A	NICKEL	U	10.0	10.0	4.5		
FS11-14.0-14.5	JB59711-9A	VANADIUM	U	23.1	23.1	5.6		
FS11-16.0-16.5	JB59711-10A	ANTIMONY	U	U	U	2.3	Qualify	15

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
FS11-16.0-16.5	JB59711-10A	CHROMIUM	U	9.7	9.7	1.2		
FS11-16.0-16.5	JB59711-10A	NICKEL	U	6.9	6.9	4.6		
FS11-16.0-16.5	JB59711-10A	VANADIUM	U	19.2	19.2	5.8		
FS11-18.0-18.5	JB59711-11A	ANTIMONY	U	U	U	2.3	Qualify	15
FS11-18.0-18.5	JB59711-11A	CHROMIUM	U	14.8	14.8	1.1		
FS11-18.0-18.5	JB59711-11A	NICKEL	U	14.4	14.4	4.5		
FS11-18.0-18.5	JB59711-11A	VANADIUM	U	22.8	22.8	5.7		
FS11-2.0-2.5	JB59711-2A	ANTIMONY	U	1.3B	1.3	2.4	Qualify	15,23
FS11-2.0-2.5	JB59711-2A	CHROMIUM	U	23.1	23.1	1.2		
FS11-2.0-2.5	JB59711-2A	NICKEL	U	107	107	4.9		
FS11-2.0-2.5	JB59711-2A	VANADIUM	U	18.4	18.4	6.1		
FS11-20.0-20.5	JB59711-15A	ANTIMONY	U	U	U	2.5	Qualify	15
FS11-20.0-20.5	JB59711-15A	CHROMIUM	U	13.6	13.6	1.3		
FS11-20.0-20.5	JB59711-15A	NICKEL	U	8.8	8.8	5.1		
FS11-20.0-20.5	JB59711-15A	VANADIUM	U	16.8	16.8	6.3		
FS11-22.0-22.5	JB59711-16A	ANTIMONY	U	U	U	2.6	Qualify	15
FS11-22.0-22.5	JB59711-16A	CHROMIUM	U	36.5	36.5	1.3		
FS11-22.0-22.5	JB59711-16A	NICKEL	U	13.8	13.8	5.2		
FS11-22.0-22.5	JB59711-16A	VANADIUM	U	19.5	19.5	6.5		
FS11-24.0-24.5	JB59711-17A	ANTIMONY	U	U	U	2.4	Qualify	15
FS11-24.0-24.5	JB59711-17A	CHROMIUM	U	10.1	10.1	1.2		
FS11-24.0-24.5	JB59711-17A	NICKEL	U	8.3	8.3	4.9		
FS11-24.0-24.5	JB59711-17A	VANADIUM	U	15.5	15.5	6.1		
FS11-26.0-26.5	JB59711-19A	ANTIMONY	U	U	U	2.7	Qualify	15
FS11-26.0-26.5	JB59711-19A	CHROMIUM	U	67.7	67.7	1.3		

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
FS11-26.0-26.5	JB59711-19A	NICKEL	U	16.5	16.5	5.3		
FS11-26.0-26.5	JB59711-19A	VANADIUM	U	16.8	16.8	6.7		
FS11-28.0-28.5	JB59711-20A	ANTIMONY	U	U	U	2.6	Qualify	15
FS11-28.0-28.5	JB59711-20A	CHROMIUM	U	9.6	9.6	1.3		
FS11-28.0-28.5	JB59711-20A	NICKEL	U	7.6	7.6	5.1		
FS11-28.0-28.5	JB59711-20A	VANADIUM	U	14.7	14.7	6.4		
FS11-30.0-30.5	JB59711-21A	ANTIMONY	U	U	U	2.6	Qualify	15
FS11-30.0-30.5	JB59711-21A	CHROMIUM	U	24.4	24.4	1.3		
FS11-30.0-30.5	JB59711-21A	NICKEL	U	9.8	9.8	5.1		
FS11-30.0-30.5	JB59711-21A	VANADIUM	U	16.0	16.0	6.4		
FS11-32.0-32.5	JB59711-22A	ANTIMONY	U	U	U	2.5	Qualify	15
FS11-32.0-32.5	JB59711-22A	CHROMIUM	U	5.4	5.4	1.2		
FS11-32.0-32.5	JB59711-22A	NICKEL	U	3.7B	3.7	4.9	Qualify	23
FS11-32.0-32.5	JB59711-22A	VANADIUM	U	10	10	6.1		
FS11-34.0-34.5	JB59711-23A	ANTIMONY	U	U	U	2.3	Qualify	15
FS11-34.0-34.5	JB59711-23A	CHROMIUM	U	7.5	7.5	1.2		
FS11-34.0-34.5	JB59711-23A	NICKEL	U	5.7	5.7	4.6		
FS11-34.0-34.5	JB59711-23A	VANADIUM	U	11.4	11.4	5.8		
FS11-4.0-4.5	JB59711-3A	ANTIMONY	U	0.38B	0.38	2.4	Qualify	15,23
FS11-4.0-4.5	JB59711-3A	CHROMIUM	U	18.3	18.3	1.2		
FS11-4.0-4.5	JB59711-3A	NICKEL	U	19.0	19.0	4.9		
FS11-4.0-4.5	JB59711-3A	VANADIUM	U	23.5	23.5	6.1		
FS11-6.0-6.5	JB59711-4A	ANTIMONY	U	U	U	2.5	Qualify	15
FS11-6.0-6.5	JB59711-4A	CHROMIUM	U	18.1	18.1	1.3		
FS11-6.0-6.5	JB59711-4A	NICKEL	U	17.1	17.1	5.0		

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
FS11-6.0-6.5	JB59711-4A	VANADIUM	U	24.4	24.4	6.3		
FS11-8.0-8.5	JB59711-5A	ANTIMONY	U	0.30B	0.30	2.5	Qualify	15,23
FS11-8.0-8.5	JB59711-5A	CHROMIUM	U	17.7	17.7	1.2		
FS11-8.0-8.5	JB59711-5A	NICKEL	U	18.7	18.7	4.9		
FS11-8.0-8.5	JB59711-5A	VANADIUM	U	22.8	22.8	6.2		
FS12-36.0-36.5	JB59711-26A	ANTIMONY	U	U	U	2.2	Qualify	15
FS12-36.0-36.5	JB59711-26A	CHROMIUM	U	22.4	22.4	1.1		
FS12-36.0-36.5	JB59711-26A	NICKEL	U	12.6	12.6	4.3		
FS12-36.0-36.5	JB59711-26A	THALLIUM	U	0.41B	0.41	1.1	Qualify	23
FS12-36.0-36.5	JB59711-26A	VANADIUM	U	33.3	33.3	5.4		
FS12-38.0-38.5	JB59711-27A	ANTIMONY	U	U	U	2.2	Qualify	15
FS12-38.0-38.5	JB59711-27A	CHROMIUM	U	17.5	17.5	1.1		
FS12-38.0-38.5	JB59711-27A	NICKEL	U	9.7	9.7	4.5		
FS12-38.0-38.5	JB59711-27A	VANADIUM	U	27.8	27.8	5.6		
FS12-38.0-38.5X	JB59711-28A	ANTIMONY	U	U	U	2.2	Qualify	15
FS12-38.0-38.5X	JB59711-28A	CHROMIUM	U	17.3	17.3	1.1		
FS12-38.0-38.5X	JB59711-28A	NICKEL	U	10.3	10.3	4.5		
FS12-38.0-38.5X	JB59711-28A	VANADIUM	U	27.7	27.7	5.6		
FS12-40.0-40.5	JB59711-30A	ANTIMONY	U	U	U	2.2	Qualify	15
FS12-40.0-40.5	JB59711-30A	CHROMIUM	U	19.1	19.1	1.1		
FS12-40.0-40.5	JB59711-30A	NICKEL	U	12.8	12.8	4.4		
FS12-40.0-40.5	JB59711-30A	VANADIUM	U	30.8	30.8	5.5		
FSTP1-5.2-5.7	JB59711-13A	ANTIMONY	U	0.37B	0.37	2.5	Qualify	15,23
FSTP1-5.2-5.7	JB59711-13A	CHROMIUM	U	20.4	20.4	1.2		
FSTP1-5.2-5.7	JB59711-13A	NICKEL	U	17.3	17.3	4.9		

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
FSTP1-5.2-5.7	JB59711-13A	VANADIUM	U	28.0	28.0	6.1		
FSTP1-7.1-7.6	JB59711-14A	ANTIMONY	U	1.1B	1.1	5.4	Qualify	15,23
FSTP1-7.1-7.6	JB59711-14A	CHROMIUM	U	28.2	28.2	2.7		
FSTP1-7.1-7.6	JB59711-14A	NICKEL	U	30.1	30.1	5.4		
FSTP1-7.1-7.6	JB59711-14A	THALLIUM	U	0.92B	0.92	2.7	Qualify	23
FSTP1-7.1-7.6	JB59711-14A	VANADIUM	U	39.6	39.6	6.7		

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

NJDEP Laboratory Footnote

1. The value reported is less than or equal to 3x the value in the method blank. It is the policy of NJDEP-DPFSR to negate the reported value due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
2. The value reported is greater than three (3) but less than ten (10) times the value in the method blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to the method blank contamination. The "B" qualifier alerts the end-user to the presence of this analyte in the method blank.
3. The value reported is less than or equal to 3x the value in the trip/field blank. It is the policy of NJDEP-DPFSR to negate the reported value as due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
4. The value reported is greater than 3x but less than ten (10) the value in the trip/field blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to trip/field blank contamination.
5. The concentration reported by the laboratory is incorrectly calculated.
6. The laboratory failed to report the presence of the analyte in the sample.
7. The reported metal value was qualified because the Calibration Verification Standard was not within the recovery range (90-110 percent).

8. In the MS/MSD Sample Analysis, this analyte fell outside the control limits of 20% RPD. Therefore, the result was qualified.
9. This analyte was qualified because the laboratory performed the MS/MSD Analysis on a field blank.
10. The reported analyte was qualified because the associated Calibration Blank result was greater than the MDL.
11. The reported value was qualified because serial dilution analysis was not within QC limit of 10% D.
12. This analyte is rejected because the laboratory exceeded the holding time for digestion and analysis.
13. The laboratory subtracted the method blank from the sample result. The reviewer's calculation has added the method blank result to the reported concentration.
14. The photocopy submitted is illegible. Therefore, the QA reviewer cannot read the laboratory's reported concentration result.
15. The reported or nondetected value was qualified because the MS/MSD spike recovery was less than 75 percent.
16. The reported value was qualified because the MS/MSD spike recovery was greater than 125 percent.
17. The reported value was qualified as estimated (J/UJ) but the bias is uncertain due to both high and low MS recoveries.
18. The reported values were qualified because the laboratory duplicate exceeded 35 percent RPD for results greater than 5X the reporting limit or the absolute difference exceeded two times the reporting limit for sample result less than 5 times the reporting limit.
19. The reported value was qualified because the field duplicate exceeded 35 percent RPD for results greater than 5X the reporting limit or the absolute difference exceeded two times the reporting limit for sample result less than 5 times the reporting limit.
20. The reported value was qualified because the LCS recovery was less than 80 percent.
21. The reported value was qualified because the sample moisture content was greater than 50 percent.
22. The reported value was rejected because the field duplicate absolute difference was greater than 4 times the RL or the RPD was greater than 120%.
23. The reported result was greater than the MDL but less than the RL and qualified (J) as estimated by the laboratory.

24. The field duplicate absolute difference exceeded two times the reporting limit for sample result less than 5 times the reporting limit.

25. The reported value was qualified because the LCS recovery was greater than 120 percent.

Aqueous Target Analyte Summary Hit List (Metals)

Site Name PPG Garfield Avenue Supplemental Remedial Investigation (GARIS) Forrest Street
Sampling Date February 12, 2014
Lab Name/ID Accutest, Dayton, NJ
SDG No JB59711A
Sample Matrix Groundwater
Trip Blank ID NA
Field Blank ID NA

Field Sample ID	Lab Sample ID	Analyte	Method Blank (ug/L)	Laboratory Sample Result (ug/L)	Validation Sample Result (ug/L)	RL (ug/L)	Quality Assurance Decision	NJDEP Validation Footnote
FS11GW-10.0-14.0	JB59711-6A	CHROMIUM	U	1400	1400	50		
FS11GW-20.0-24.0	JB59711-12A	CHROMIUM	U	7800	7800	100		
FS11GW-30.0-34.0	JB59711-18A	CHROMIUM	U	5310	5310	100		
FS11GW-40.0-44.0	JB59711-24A	CHROMIUM	U	10700	10700	100		
FS12GW-40.0-44.0	JB59711-29A	CHROMIUM	U	9240	9240	100		

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

NJDEP Laboratory Footnote

1. The value reported is less than or equal to 3x the value in the method blank. It is the policy of NJDEP-DPFSR to negate the reported value due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
2. The value reported is greater than three (3) but less than ten (10) times the value in the method blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to the method blank contamination. The "B" qualifier alerts the end-user to the presence of this analyte in the method blank.
3. The value reported is less than or equal to 3x the value in the trip/field blank. It is the policy of NJDEP-DPFSR to negate the reported value as due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.

4. The value reported is greater than 3x but less than ten (10) the value in the trip/field blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to trip/field blank contamination.
5. The concentration reported by the laboratory is incorrectly calculated.
6. The laboratory failed to report the presence of the analyte in the sample.
7. The reported metal value was qualified because the Calibration Verification Standard was not within the recovery range (90-110 percent).
8. In the MS/MSD Sample Analysis, this analyte fell outside the control limits of 20% RPD. Therefore, the result was qualified.
9. This analyte was qualified because the laboratory performed the MS/MSD Analysis on a field blank.
10. The reported analyte was qualified because the associated Calibration Blank result was greater than the MDL.
11. The reported value was qualified because serial dilution analysis was not within QC limit of 10% D.
12. This analyte is rejected because the laboratory exceeded the holding time for digestion and analysis.
13. The laboratory subtracted the method blank from the sample result. The reviewer's calculation has added the method blank result to the reported concentration.
14. The photocopy submitted is illegible. Therefore, the QA reviewer cannot read the laboratory's reported concentration result.
15. The reported or nondetected value was qualified because the MS/MSD spike recovery was less than 75 percent.
16. The reported value was qualified because the MS/MSD spike recovery was greater than 125 percent.
17. The reported value was qualified as estimated (J/UJ) but the bias is uncertain due to both high and low MS recoveries.
18. The reported values were qualified because the laboratory duplicate exceeded 35 percent RPD for results greater than 5X the reporting limit or the absolute difference exceeded two times the reporting limit for sample result less than 5 times the reporting limit.
19. The reported value was qualified because the field duplicate exceeded 35 percent RPD for results greater than 5X the reporting limit or the absolute difference exceeded two times the reporting limit for sample result less than 5 times the reporting limit.

20. The reported value was qualified because the LCS recovery was less than 80 percent.
21. The reported value was qualified because the sample moisture content was greater than 50 percent.
22. The reported value was rejected because the field duplicate absolute difference was greater than 4 times the RL or the RPD was greater than 120%.
23. The reported result was greater than the MDL but less than the RL and qualified (J) as estimated by the laboratory.
24. The field duplicate absolute difference exceeded two times the reporting limit for sample result less than 5 times the reporting limit.
25. The reported value was qualified because the LCS recovery was greater than 120 percent.

Attachment B

Data Validation Report Form

Client Name: PPG Industries	Project Number: 60154801.6001A
Site Location: PPG Garfield Avenue Supplemental Remedial Investigation (GARIS) Forrest Street Groundwater and Soil, Jersey City, NJ	Project Manager: William Spronz
Laboratory: Accutest, Dayton, NJ	Type of Validation: Full
Laboratory Job No: JB59711	Date Checked: 4/16/14
Validator: Paula DiMattei	Peer: Lisa Krowitz

ITEM	YES	NO	N/A	COMMENTS
Sample results included?	X			
Reporting Limits met project requirements?	X			
Field I.D. included?	X			
Laboratory I.D. included?	X			
Sample matrix included?	X			
Sample receipt temperature 2-6C?	X			
Signed COCs included?	X			
Date of sample collection included?	X			
Date of sample digestion included?	X			
Holding time to digestion met criteria? (Soils -30 days from collection to digestion.)	X			
Date of analysis included?	X			
Holding time to analysis met criteria? (Soils -168 hours from digestion to analysis; Aqueous - 24 hours from collection to analysis.)	X			
Method reference included?	X			
Laboratory Case Narrative included?	X			

Definitions: MDL Method Detection Limit; %R Percent Recovery; RL Reporting Limit; RPD Relative Percent Difference; RSD Relative Standard Deviation :Corr Correlation Coefficient.

ITEM	YES	NO	N/A	COMMENTS
Initial calibration documentation included in lab package?	X			
1) Blank plus 4 standards (7196A) or blank plus 3 standards (7199)	X			
2) Correlation coefficient of =0.995 (7196A) or =0.999 (7199)	X			
3) Calibrate daily or each time instrument is set up.	X			
Calibration Check Standard (CCS) for 7196A and Quality Control Sample (QCS) for 7199 Included in Lab Package?	X			
1) %R criteria met? (90 - 110%)	X			
2) Correct frequency of one per every 10 samples	X			
3) CCS and QCS from independent source and at mid-level of calibration curve	X			
Calibration Blanks	X			
1) Analyzed prior to initial calibration standards and after each CCS/QCS?	X			
2) Absolute value should not exceed MDL.	X			
Method Blank, Field Blanks and/or Equipment Blanks Included in Lab Package?	X			FS-FB20140212
1) Method blank analyzed with each preparation batch?	X			
2) Absolute value should not exceed MDL.	X			
Eh and pH Data	X			
1) Eh and pH data was included and plotted for all samples?	X			
Soluble Matrix Spike Data Included in Lab Package?	X			
1) Soluble Matrix %R criteria met? (75-125%R).	X			
2) Was the spike concentration 40 mg/Kg or twice the sample concentration?	X			
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	X			
Insoluble Matrix Spike Data Included in Lab Package?	X			
1) Insoluble Matrix %R criteria met? (75-125%R).	X			
2) Was the spike concentration around 400 to 800 mg/Kg?		X		Spiked at 1220 mg/kg and 1020 mg/kg. No impact to data.
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	X			

ITEM	YES	NO	N/A	COMMENTS
Post Digestion Spike	X			
1) Post Digestion Spike %R criteria met? (85-115%R).	X			
2) Was the spike concentration 40 mg/Kg or twice the sample concentration?	X			
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	X			
Sample Duplicate Data Included in Lab Package?	X			Aqueous: FS11GW-10.0-14.0; Soil: FS11-14.0-14.5 and FS11-28.0-28.5
1) RPD criteria met? (RPD ≤20%) if both results are ≤4x RL or absolute difference ≤RL if either or both results are <4xRL.	X			
2) Was a sample duplicate analyzed at the frequency of 1 per batch or 20 samples?	X			
Was a Laboratory Control Sample (LCS) Included in Lab Package?	X			
1) %R criteria met? (80-120%R).	X			
2) Was an LCS analyzed at the frequency of 1/batch or 20 samples?	X			
Were any Field Duplicate samples submitted with this SDG?	X			FS12-38.0-38.5 and FS12-38.0-38.5X
1) Were Field duplicate RPD criteria met? (RPD≤20% for both sample results >4xRL or absolute difference ≤ RL if either or both results are <4xRL.	X			
Were all sample quantitation and reporting requirements met?	X			
1) Were all solid samples reported with percent solids > 50% ?	X			
2) Were any samples analyzed or reported with dilutions?		X		
Miscellaneous Items	X			
1) For soils by 7196A, was the pH within a range of 7.0-8.0?	X			
2) For soils by 7199, was the pH within a range of 9.0-9.5?			X	
3) For aqueous by 7196A, was the pH with a range of 1.5-2.5?	X			
4) For soils (3060A), was the digestion temperature 90-95C for at least 60 minutes?	X			
5) For 7199, was each sample injected twice and was the RPD =20?			X	

SDG#: JB59711
Batch: GN99656
 Cr+6 ICAL 02/18/14
 Soil
 (p. 100 of data pkg)

x - concentration	y - response
0	0
0.01	0.009
0.05	0.042
0.1	0.088
0.3	0.263
0.5	0.443
0.8	0.699
1	0.877

(p. 100 of data pkg)

AECOM Calculated Intercept	0.00009	OK	Reported intercept	0.00009
AECOM Slope	0.8769	OK	Reported Slope	0.8769
AECOM Calculated r	0.99998	OK	Reported r	0.99998

LCS calculation

GP77932-B1 pgs. 100

Background Absorbance	0
Total absorbance	0.853
Total absorbance - background	0.853
Instrument Concentration	0.973
Sample weight (mg/kg)	0.0025
Final Volume (L)	0.1
Dilution Factor	1

AECOM Calculated LCS Result (mg/Kg)	38.9	OK	Reported Result (mg/Kg)	38.9
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%R = Found/True*100

p. 69

True Value (mg/kg)	40
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AECOM Calculated %R	97.3	OK	Reported %R	97.3
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MS calculation

JB59711-9 [FS11-14.0-14.5] pg. 100

Background reading	0
Total absorbance	0.423
Total absorbance - background	0.423
Instrument Concentration	0.4823
Sample weight (mg/kg)	0.00243
Final Volume (L)	0.1
Percent solids	0.862
Dilution Factor	50

AECOM Calculated MS Result (mg/Kg)	1150	OK	Reported Result (mg/Kg)	1150
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%R = Found/True*100

JB59711-9 [FS11-14.0-14.5] pg. 71

True Value (mg/kg)	1220
Native concentration (mg/Kg)	0.27

AECOM%R	94.3	OK rounding	Reported %R	94.4
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Percent Solids

JB59711-9 [FS11-14.0-14.5] pg. 73

Empty dish weight=	27.04
Wet weight=	34.50
Dry weight=	33.47

AECOM%solids =	86.2	OK	reported %solids=	86.2
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Reporting Limit**JB59711-9 [FS11-14.0-14.5] pg. 22**

Low Standard	0.01
Initial weight (mg/kg)	0.00241
Final volume (L)	0.1
Percent solids	0.862
Dilution Factor	1

Reporting Limit	0.48	OK rounding	Reported RL (mg/Kg)=	0.46
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Sample Calculations**JB59711-9 [FS11-14.0-14.5] pg. 22, 100**

Background reading	0.003
Total absorbance	0.008
Total absorbance - background	0.005
Instrument Response	0.006
Sample weight (mg/kg)	0.00241
Final Volume (L)	0.1
Percent solids	0.862
Dilution Factor	1

AECOM Calculated Result (mg/Kg)	0.27	OK	Reported Result (mg/Kg)	0.27
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JB59711-1 [FS11-0.0-0.5] pg. 14, 100

Background reading	0.014
Total absorbance	0.023
Total absorbance - background	0.009
Instrument Response	0.010
Sample weight (mg/kg)	0.00244
Final Volume (L)	0.1
Percent solids	0.894
Dilution Factor	1

AECOM Calculated Result (mg/Kg)	0.47	OK	Reported Result (mg/Kg)	0.47
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JB59711-2 [FS11-2.0-2.5] pg. 15, 100

Background reading	0.016
Total absorbance	0.056
Total absorbance - background	0.04
Instrument Response	0.046
Sample weight (mg/kg)	0.0024
Final Volume (L)	0.1
Percent solids	0.813
Dilution Factor	1

AECOM Calculated Result (mg/Kg)	2.3	OK	Reported Result (mg/Kg)	2.3
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Client Name: PPG Industries	Project Number: 60154801.6001A
Site Location: PPG Garfield Avenue Supplemental Remedial Investigation (GARIS) Forrest Street Groundwater and Soil, Jersey City, NJ	Project Manager: William Spronz
Laboratory: Accutest, Dayton, NJ	Type of Validation: Limited
Laboratory Job No: JB59711A	Date Checked: 4/16/14
Validator: Paula DiMattei	Peer: Lisa Krowitz

ITEM	YES	NO	N/A	COMMENTS
Sample results included?	X			
Reporting Limits met project requirements?	X			
Field I.D. included?	X			
Laboratory I.D. included?	X			
Sample matrix included?	X			
Sample receipt temperature 2-6C?	X			
Signed COCs included?	X			
Date of sample collection included?	X			
Date of sample digestion included?	X			
Date of analysis included?	X			
Holding time met QC criteria? (Metals -180 days from sample collection; Mercury - 28 days from sample collection. If HT exceeded by 10 days R all results.	X			
Method reference included?	X			
Laboratory Case Narrative included?	X			

Definitions: MDL Method Detection Limit; %R Percent Recovery; RL Reporting Limit; RPD Relative Percent Difference; RSD Relative Standard Deviation ;Corr Correlation Coefficient.

ITEM	YES	NO	N/A	COMMENTS
Sample dilutions?	X			
Initial calibration documentation included in lab package?			X	NA for a Limited Review
1) Calibrate daily or each time instrument is set up.			X	
2) ICP (6010) -Blank plus 1 standard? If no, reject (R) data.			X	
3) Hg (7470/7471) -Blank plus 5 standards? If no, reject (R) data.			X	
Initial Calibration Verification Standard (ICV) for ICP (6010) and Initial Calibration Check Standard (ICCS) for Hg (7470/7471) included in lab package?			X	
1) Analyzed immediately after initial calibration? If no, reject (R) data.			X	
2) %R criteria met? (90-110%). If no, J positive results for affected analyte(s) if %R between 80-89% and 111-120% and indicate bias; UJ non-detect results for affected analyte(s) if %R between 80-89% , and R all data for affected analyte(s) if %R 120%.			X	
3) Spot check ICV/ICCS results for several analytes.			X	
Continuing Calibration Verification Standard (CCV) for ICP (6010) and Calibration Check Standard (CCS) for Hg (7470/7471) included in Lab Package?			X	
1) Analyzed immediately after each ICV/ICC/CB and after every 10 samples? If no, reject (R) data.			X	
2) CCS and CCV from independent source and at mid-level of calibration curve. If no, reject (R) data.			X	
3) %R criteria met? (90-110%R). If no, J positive results for affected analyte(s) if %R between 80-89% and 111-120% and indicate bias; UJ non-detect results for affected analyte(s) if %R between 80-89% and R all data for affected analyte(s) if %R 120%.			X	
4) Spot check CCV/CCS results for several analytes.			X	
Low Calibration Standard (CRI) included in Lab Package?			X	
1) %R criteria met? - 50-150% for Co, Mn, Zn, by ICP-MS; Pb, Tl by 6010; 70-130% all others. If no, refer to ILM05.4 NJ SOP 5.A.2 for actions.			X	

ITEM	YES	NO	N/A	COMMENTS
Calibration Blanks			X	
1) Analyzed after daily calibration and after each ICV/ICC/CCV/CCS and after every 10 samples? If no, reject (R) data.			X	
2) Absolute value 10xCB result, no qualification.			X	
Method Blank Included in Lab Package?	X			
1) Method blank analyzed with each preparation batch or every SDG, or 1/20 samples? If no, reject (R) data, except no aqueous MB required for FB/EB if only soil samples were analyzed.	X			
2) Method blank analyzed 1/20 samples? If - MB 1/25, J sample results from 21-25; -MB >1/25, R sample results after 25th sample.	X			
3) MB results nondetect? If no, -sample result 3xMB but 10xMB, no qualification.		X		See nonconformance table below.
4) Negative MB result reported? If yes, -Positive sample result		X		
Field Blanks/Equipment Blanks Included in Lab Package?	X			FS-FB20140212
1) FB/EB result non-detect? If no, -sample result 3xFB/EB but 10xFB/EB, no qualification.	X			
ICP Interference Check Sample (ICS) included in Lab Package?			X	NA for a Limited Review
1) Analyzed at beginning of analytical run? If no, reject (R) data.			X	
2) %R criteria met? (80-120%) If no, %R>120%, no qualification if sample result non-detect; %R between 121-150%, J positive results, biased high; %R between 50-79%, J/UJ results, biased low; %R150%, reject (R) result			X	
3) Spot check accuracy of %Rs			X	
Matrix Spike/Matrix Spike Duplicate Data Included in Lab Package?	X			Soil MS: FS11-28.0-28.5 (and batch QC) Aqueous: Batch QC. Batch QC was not assessed.
1) MS/MSD %R (75-125%R) and RPD (+20%) criteria met? - %R>125% J positive results for affected analyte(s) for all samples in the same batch/SDG, accept NDs; -%R		X		
2) Was a sample spiked at the frequency of 1/batch or 20 samples?	X			
3) Was the MS performed on a site sample?	X			
4) Was the MS performed on a FB/EB or TB? If yes, J all sample data.		X		

ITEM	YES	NO	N/A	COMMENTS
Post Digestion Spike			X	NA for a Limited Review
1) %R criteria met? (75-125%R) - %R>125% J positive results for affected analyte(s) for all samples in the same batch/SDG, accept NDs.; - %R			X	
2) Was the spike performed on a FB/EB or TB? If yes, J all sample data.			X	
3) Was a sample spiked at the frequency of 1/batch or 20 samples?			X	
Laboratory Duplicate Data Included in Lab Package?		X		MS/MSD analyses were performed in lieu of laboratory duplicate analysis.
Aqueous - If RPD is >20% but 5x the QL, estimate (J) results >the QL. - If RPD is >100%, reject R results >/= the QL.- If sample and/or duplicate is the QL, estimate (J) positive results 2x the QL, reject R non-detects and positive results			X	
Soil - If RPD is >35% but 5x the QL, estimate (J) results > the QL. - If RPD is >120%, reject results > the QL. - If sample and/or duplicate is 2x the QL, estimate (J) positive results 4x the QL, reject nondetects and positive results			X	
Was a Laboratory Control Sample (LCS) Included in Lab Package?	X			
1) LCS %R criteria met? (80-120%R). If no, J/UJ all affected analytes(s) for all samples in the same batch/SDG.	X			
2) Was an LCS analyzed at the frequency of 1/batch or 20 samples? If no, J/UJ affected analyte(s) for all samples in the same batch/SDG.	X			
Serial Dilution			X	NA for a Limited Review
1) %D(25xIDL (7000) or >10xIDL (6010) and %D >10% J positive results for affected analyte(s) for all samples in the same batch/SDG, accept NDs.			X	
2) Was the frequency 1/batch or 20 samples?			X	
3) Was a site sample used?			X	
4) Was a FB/EB or TB used? If yes, J all sample data.			X	
5) Spot check accuracy of %Ds.			X	

ITEM	YES	NO	N/A	COMMENTS
Field Duplicate Data included in Lab Package?	X			FS12-38.0-38.5 and FS12-38.0-38.5X
Aqueous - If RPD is >20% but 5x the QL, estimate (J) results > the QL. - If RPD is >100%, reject R results >= the QL. - If sample and/or duplicate is the QL, estimate (J) positive results 2x the QL, reject R non-detects and positive results			X	
Soil - If RPD is >35% but 5x the QL, estimate (J) results > the QL. - If RPD is >120%, reject results > the QL. - If sample and/or duplicate is 2x the QL, estimate (J) positive results 4x the QL, reject nondetects and positive results		X		All criteria met.
Percent Solids data included in Lab Package?	X			
1) %Solids criteria (Reg 2 criteria) met? (>=50%)	X			

Laboratory Blanks

Blank ID	Analyte	Result	QL	Units	Associated Samples
MP77750-MB1	Antimony	1.8	6.0	ug/L	All aqueous samples

Matrix Spikes

Sample ID	Analyte	Batch	MS % Recovery	MSD % Recovery	Lower Limit	Upper Limit	RPD	RPD Limit
FS11-28.0-28.5	Antimony	MP77752	60.6	63.8	75	125	ok	20

Data Validation Report

Project:	PPG Garfield Avenue Supplemental Remedial Investigation (GARIS) Forrest Street Groundwater and Soil	
Laboratory:	Accutest, Dayton, NJ	
Laboratory Job No.:	JB60418 and JB60418A	
Analysis/Method:	Hexavalent Chromium SW846 3060A/7196 Metals by ICP-AES/ SW846-6010	
Validation Level:	Full (Hexavalent Chromium) Limited (Metals)	
Site Location/Address:	Forrest Street, Jersey City, NJ	
AECOM Project No:	60154801.6001A	
Prepared by:	Paula DiMattei /AECOM	Completed on: 04/16/2014
Reviewed by:	Lisa Krowitz /AECOM	File Name: JB60418_A_2014-04-16_DV Report-F

Introduction

The data were reviewed in accordance with the FSP-QAPP and the following NJDEP validation Standard Operating Procedures (SOP):

- NJDEP Office of Data Quality SOP 5.A.10, Rev 3 (September 2009), SOP for Analytical Data Validation of Hexavalent Chromium - for USEPA SW-846 Method 3060A, USEPA SW-846 Method 7196A and USEPA SW-846 Method 7199;
- NJDEP Office of Data Quality SOP 5.A.16, Rev 1 (May 2002), Quality Assurance Data Validation of Analytical Deliverables for Inorganics (based on USEPA SW-846 Methods)

The results of quality control data analyzed with site samples were used to assess the overall reliability of the data. The following qualifiers were used to identify data quality issues:

- U: Indicates the analyte was not detected in the sample above the sample reporting limit.
- J: Indicates the result was an estimated value; the associated numerical value was an approximate concentration of the analyte in the sample.
- UJ: Indicates the analyte was not detected above the reporting limit and the reporting limit was approximate.
- R: The sample result was rejected due to serious deficiencies; the presence or absence of the analyte could not be confirmed.
- RA: The sample result was rejected but is still considered usable.

Sample Information

The samples listed below were collected by AECOM on February 24, 2014 as part of the PPG Garfield Avenue Supplemental Remedial Investigation (GARIS) Forrest Street Groundwater and Soil sampling at the PPG Forrest Street site, Jersey City, NJ. Only the samples and parameters listed below were validated.

Field ID	Laboratory ID	Matrix	Fraction
FS6-0.0-0.5	JB60418-1	Soil	Hexavalent Chromium
FS6-0.0-0.5	JB60418-1A	Soil	Metals
FS6-10.0-10.5	JB60418-7	Soil	Hexavalent Chromium
FS6-10.0-10.5	JB60418-7A	Soil	Metals
FS6-12.0-12.5	JB60418-8	Soil	Hexavalent Chromium
FS6-12.0-12.5	JB60418-8A	Soil	Metals
FS6-14.0-14.5	JB60418-9	Soil	Hexavalent Chromium
FS6-14.0-14.5	JB60418-9A	Soil	Metals
FS6-16.0-16.5	JB60418-10	Soil	Hexavalent Chromium
FS6-16.0-16.5	JB60418-10A	Soil	Metals
FS6-18.0-18.5	JB60418-11	Soil	Hexavalent Chromium
FS6-18.0-18.5	JB60418-11A	Soil	Metals
FS6-2.0-2.5	JB60418-2	Soil	Hexavalent Chromium
FS6-2.0-2.5	JB60418-2A	Soil	Metals
FS6-4.0-4.5	JB60418-3	Soil	Hexavalent Chromium
FS6-4.0-4.5	JB60418-3A	Soil	Metals
FS6-6.0-6.5	JB60418-4	Soil	Hexavalent Chromium
FS6-6.0-6.5	JB60418-4A	Soil	Metals
FS6-8.0-8.5	JB60418-5	Soil	Hexavalent Chromium
FS6-8.0-8.5	JB60418-5A	Soil	Metals
FS6GW-10.0-14.0	JB60418-6	Ground Water	Hexavalent Chromium
FS6GW-10.0-14.0	JB60418-6A	Ground Water	Metals
FS6GW-20.0-24.0	JB60418-12	Ground Water	Hexavalent Chromium
FS6GW-20.0-24.0	JB60418-12A	Ground Water	Metals
FS7-0.0-0.5	JB60418-14	Soil	Hexavalent Chromium
FS7-0.0-0.5	JB60418-14A	Soil	Metals
FS7-10.0-10.5	JB60418-21	Soil	Hexavalent Chromium
FS7-10.0-10.5	JB60418-21A	Soil	Metals
FS7-12.0-12.5	JB60418-22	Soil	Hexavalent Chromium
FS7-12.0-12.5	JB60418-22A	Soil	Metals
FS7-14.0-14.5	JB60418-23	Soil	Hexavalent Chromium
FS7-14.0-14.5	JB60418-23A	Soil	Metals
FS7-16.0-16.5	JB60418-24	Soil	Hexavalent Chromium
FS7-16.0-16.5	JB60418-24A	Soil	Metals
FS7-18.0-18.5	JB60418-25	Soil	Hexavalent Chromium

Field ID	Laboratory ID	Matrix	Fraction
FS7-18.0-18.5	JB60418-25A	Soil	Metals
FS7-2.0-2.5	JB60418-15	Soil	Hexavalent Chromium
FS7-2.0-2.5	JB60418-15A	Soil	Metals
FS7-2.0-2.5X (Field Duplicate of FS7-2.0-2.5)	JB60418-16	Soil	Hexavalent Chromium
FS7-2.0-2.5X (Field Duplicate of FS7-2.0-2.5)	JB60418-16A	Soil	Metals
FS7-20.0-20.5	JB60418-27	Soil	Hexavalent Chromium
FS7-20.0-20.5	JB60418-27A	Soil	Metals
FS7-22.0-22.5	JB60418-28	Soil	Hexavalent Chromium
FS7-22.0-22.5	JB60418-28A	Soil	Metals
FS7-24.0-24.5	JB60418-29	Soil	Hexavalent Chromium
FS7-24.0-24.5	JB60418-29A	Soil	Metals
FS7-26.0-26.5	JB60418-30	Soil	Hexavalent Chromium
FS7-26.0-26.5	JB60418-30A	Soil	Metals
FS7-28.0-28.5	JB60418-31	Soil	Hexavalent Chromium
FS7-28.0-28.5	JB60418-31A	Soil	Metals
FS7-30.0-30.5	JB60418-33	Soil	Hexavalent Chromium
FS7-30.0-30.5	JB60418-33A	Soil	Metals
FS7-32.0-32.5	JB60418-34	Soil	Hexavalent Chromium
FS7-32.0-32.5	JB60418-34A	Soil	Metals
FS7-34.0-34.5	JB60418-35	Soil	Hexavalent Chromium
FS7-34.0-34.5	JB60418-35A	Soil	Metals
FS7-36.0-36.5	JB60418-36	Soil	Hexavalent Chromium
FS7-36.0-36.5	JB60418-36A	Soil	Metals
FS7-38.0-38.5	JB60418-37	Soil	Hexavalent Chromium
FS7-38.0-38.5	JB60418-37A	Soil	Metals
FS7-4.0-4.5	JB60418-17	Soil	Hexavalent Chromium
FS7-4.0-4.5	JB60418-17A	Soil	Metals
FS7-40.0-40.5	JB60418-39	Soil	Hexavalent Chromium
FS7-40.0-40.5	JB60418-39A	Soil	Metals
FS7-6.0-6.5	JB60418-18	Soil	Hexavalent Chromium
FS7-6.0-6.5	JB60418-18A	Soil	Metals
FS7-8.0-8.5	JB60418-19	Soil	Hexavalent Chromium
FS7-8.0-8.5	JB60418-19A	Soil	Metals
FS7GW-10.0-14.0	JB60418-20	Ground Water	Hexavalent Chromium
FS7GW-10.0-14.0	JB60418-20A	Ground Water	Metals
FS7GW-20.0-24.0	JB60418-26	Ground Water	Hexavalent Chromium
FS7GW-20.0-24.0	JB60418-26A	Ground Water	Metals
FS7GW-30.0-34.0	JB60418-32	Ground Water	Hexavalent Chromium
FS7GW-30.0-34.0	JB60418-32A	Ground Water	Metals

Field ID	Laboratory ID	Matrix	Fraction
FS7GW-40.0-44.0	JB60418-38	Ground Water	Hexavalent Chromium
FS7GW-40.0-44.0	JB60418-38A	Ground Water	Metals
FS-FB20140224 (Equipment Blank)	JB60418-13	Aqueous	Hexavalent Chromium
FS-FB20140224 (Equipment Blank)	JB60418-13A	Aqueous	Metals

The samples were collected following the procedures detailed in the Remedial Investigation Work Plan - Soil for Non-Residential Chromate Chemical Production Waste Sites 114, 132, 133, 135, 137, 143, and 186, Jersey City, New Jersey, or applicable proposal or work plan, and the Field Sampling Plan/Quality Assurance Project Plan for Non-Residential and Residential Chromium Sites Hudson County, New Jersey (December 2011).

General Comments

The data package was complete. Quality control (QC) issues identified during validation are discussed below. Refer to the Target Analyte Summary Hit(s) in Attachment A for a listing of all detected results, qualified results, and associated qualifications, where applicable. The nonconformances for each section discussed below are presented in Attachment B.

Hexavalent Chromium

MS Results

There were two soil matrix spike (MS) samples [FS6-8.0-8.5 (JB60418-4) and FS7-36.0-36.5 (JB60418-36)], and one groundwater MS sample [FS6GW-10.0-14.0 (JB60418-36)] associated with the samples in this SDG that were used for supporting data quality recommendations.

For the MS on soil sample FS6-8.0-8.5, the soluble and insoluble MS recoveries were 121.5% and 109.6%, respectively; which met the quality control (QC) criteria of 75-125%. The post digestion spike (PDS) recovery was 105%, which met the PDS criteria of 85-115%. No data qualification was required on the basis of spike recoveries.

For the MS on soil sample FS7-36.0-36.5, the soluble and insoluble MS recoveries were 90.5% and 100.2%, respectively; which met the QC criteria of 75-125%. The PDS recovery was 87.5%, which met the PDS criteria of 85-115%. No data qualification was required on the basis of spike recoveries.

For the MS on aqueous sample FS6GW-10.0-14.0, the MS recovery was 113.3%; which met the QC criteria of 85-115%. No data qualification was required on the basis of this spike recovery.

Sample Results

Reported results (flagged B by the laboratory) that were less than the reporting limit (RL), but greater than or equal to the method detection limit (MDL) are approximate values and have been qualified as estimated (J).

Metals

Laboratory Blanks/Equipment Blanks

Method Blank

Chromium, nickel, and/or vanadium were detected in the method blanks (MP77954-MB1 and MP77955-MB1) associated with the soil samples in this SDG, at concentrations above the MDLs, but below the RLs. Since the results for chromium, nickel, and vanadium in the associated soil samples were greater than ten times the amount detected in the method blank, no qualifications were required.

MS Results

Sample FS7-36.0-36.5 (JB60418-36A) was the site sample used for the MS analysis of one soil preparation batch associated with the Method 6010 analysis of the soil samples in this SDG. The laboratory provided batch QC for the remaining soil sample preparation batch and for the aqueous samples. The batch QC was not assessed.

For the MS analysis on sample FS7-36.0-36.5, the recovery of antimony was below the QC criteria of 75-125%. The positive and nondetect results for antimony in all soil samples were qualified as estimated (J/UJ) with potential low bias.

Field Duplicate Results

The field duplicate pair in this SDG was FS7-2.0-2.5 and FS7-2.0-2.5X.

The reported parent sample and field duplicate results were less than 5 times the RL for antimony. The absolute difference between the reported field duplicate results was greater than the absolute difference criteria of less than or equal to two times the RL; therefore, all antimony soil results were qualified as estimated (J/UJ).

Sample Results

Reported results (flagged B by the laboratory) that were less than the RL, but greater than or equal to the MDL are approximate values that have been qualified as estimated (J).

Data Quality and Usability

In general, these data appear to be valid and may be used for decision-making purposes. No data were rejected. Qualified results, if applicable, are presented in Attachments A and B.

Sample results for antimony qualified due to low MS recoveries and poor field duplicate precision are usable as estimated values with a potential low bias due to the low MS recovery.

Sample results reported between the MDL and RL are usable as estimated values with an unknown directional bias.

ATTACHMENTS

Attachment A: Target Analyte Summary Hitlist(s)

Attachment B: Data Validation Report Form

Attachment A

Target Analyte Summary Hitlist(s)

Soil Target Analyte Summary Hit List (Hexavalent Chromium)

Site Name PPG Garfield Avenue Supplemental Remedial Investigation (GARIS) Forrest Street
Sampling Date February 24, 2014
Lab Name/ID Accutest, Dayton, NJ
SDG No JB60418
Sample Matrix Soil
Trip Blank ID NA
Field Blank ID FS-FB20140224

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
FS6-0.0-0.5	JB60418-1	CHROMIUM (HEXAVALENT)	U	31.4	31.4	0.48		
FS6-10.0-10.5	JB60418-7	CHROMIUM (HEXAVALENT)	U	29.0	29.0	0.49		
FS6-12.0-12.5	JB60418-8	CHROMIUM (HEXAVALENT)	U	13.3	13.3	0.49		
FS6-14.0-14.5	JB60418-9	CHROMIUM (HEXAVALENT)	U	7.3	7.3	0.48		
FS6-16.0-16.5	JB60418-10	CHROMIUM (HEXAVALENT)	U	11.9	11.9	0.45		
FS6-18.0-18.5	JB60418-11	CHROMIUM (HEXAVALENT)	U	21.3	21.3	0.46		
FS6-2.0-2.5	JB60418-2	CHROMIUM (HEXAVALENT)	U	17.8	17.8	0.47		
FS6-4.0-4.5	JB60418-3	CHROMIUM (HEXAVALENT)	U	2.7	2.7	0.45		
FS6-6.0-6.5	JB60418-4	CHROMIUM (HEXAVALENT)	U	42.7	42.7	0.55		
FS6-8.0-8.5	JB60418-5	CHROMIUM (HEXAVALENT)	U	40.9	40.9	0.50		
FS7-0.0-0.5	JB60418-14	CHROMIUM (HEXAVALENT)	U	16.0	16.0	0.47		
FS7-10.0-10.5	JB60418-21	CHROMIUM (HEXAVALENT)	U	12.7	12.7	0.48		
FS7-12.0-12.5	JB60418-22	CHROMIUM (HEXAVALENT)	U	12.8	12.8	0.48		
FS7-14.0-14.5	JB60418-23	CHROMIUM (HEXAVALENT)	U	12.9	12.9	0.46		
FS7-16.0-16.5	JB60418-24	CHROMIUM (HEXAVALENT)	U	16.5	16.5	0.46		
FS7-18.0-18.5	JB60418-25	CHROMIUM (HEXAVALENT)	U	10.7	10.7	0.47		
FS7-20.0-20.5	JB60418-27	CHROMIUM (HEXAVALENT)	U	26.9	26.9	0.45		
FS7-22.0-22.5	JB60418-28	CHROMIUM (HEXAVALENT)	U	21.0	21.0	0.47		

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
FS7-24.0-24.5	JB60418-29	CHROMIUM (HEXAVALENT)	U	104	104	2.6		
FS7-26.0-26.5	JB60418-30	CHROMIUM (HEXAVALENT)	U	29.0	29.0	0.49		
FS7-28.0-28.5	JB60418-31	CHROMIUM (HEXAVALENT)	U	1.9	1.9	0.53		
FS7-30.0-30.5	JB60418-33	CHROMIUM (HEXAVALENT)	U	0.44B	0.44	0.51	Qualify	31
FS7-32.0-32.5	JB60418-34	CHROMIUM (HEXAVALENT)	U	0.26B	0.26	0.49	Qualify	31
FS7-34.0-34.5	JB60418-35	CHROMIUM (HEXAVALENT)	U	0.20B	0.20	0.48	Qualify	31
FS7-36.0-36.5	JB60418-36	CHROMIUM (HEXAVALENT)	U	0.20B	0.20	0.49	Qualify	31
FS7-4.0-4.5	JB60418-17	CHROMIUM (HEXAVALENT)	U	0.17B	0.17	0.51	Qualify	31
FS7-40.0-40.5	JB60418-39	CHROMIUM (HEXAVALENT)	U	0.14B	0.14	0.48	Qualify	31
FS7-6.0-6.5	JB60418-18	CHROMIUM (HEXAVALENT)	U	87.6	87.6	2.5		
FS7-8.0-8.5	JB60418-19	CHROMIUM (HEXAVALENT)	U	56.3	56.3	1.0		

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

NJDEP Laboratory Footnote

1. The value reported is less than or equal to 3x the value in the preparation/reagent blank. It is the policy of NJDEP-DPFSR to negate the reported value due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
2. The value reported is greater than three (3) times but less than ten (10) times the value in the preparation/reagent blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to the preparation/reagent blank contamination. The "B" qualifier alerts the end-user to the presence of this analyte in the preparation/reagent blank.
3. The value reported is less than or equal to three (3) times the value in the trip/field blank. It is the policy of NJDEP-DPFSR to negate the reported value as due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
4. The value reported is greater than three (3) times but less than ten (10) times the value in the trip/field blanks and is considered "real". However, the reported value must be quantitatively qualified "J" due to trip/field blank contamination.

5. The concentration reported by the laboratory is incorrectly calculated.
6. The laboratory failed to report the presence of the analyte in the sample.
7. The reported Hexavalent Chromium value was qualified because the Calibration Check Standard was not within the recovery range (90-110 percent).
8. In the Duplicate Sample Analysis, Hexavalent Chromium fell outside the control limits of ≤ 20 percent for sample results $> 4xRL$ or $+ RL$ for sample results $< 4xRL$. Therefore, the result was qualified.
9. This analyte was rejected because the laboratory performed the Duplicate Analysis on a field blank.
10. The reported value was qualified because the PVS recovery was greater than 115 percent.
11. The reported value was qualified because the PVS recovery was less than 85 percent.
12. The non-detected value was qualified (UJ) because the PVS recovery was less than 85 percent. The possibility of a false negative exists.
13. The reported analyte was qualified because the associated Calibration Blank result was greater than the MDL.
14. The laboratory made a transcription error. No hits were found in the raw data.
15. This analyte is qualified or rejected because the laboratory exceeded the holding time for digestion and/or analysis.
16. The laboratory subtracted the preparation/reagent blank from the sample result. The Reviewer's calculation puts the preparation/reagent blank back into the result.
17. The photocopy is unreadable. Therefore, the QA reviewer cannot read the laboratory's reported concentration result.
18. The reported value was qualified because the predigestion spike recovery was less than 75 %, but greater than 50%.
19. The reported value was qualified because the predigestion spike recovery was greater than 125 percent.
20. The non-detected value was qualified (UJ) because the redigestion spike recovery was less than 75 percent. The possibility of a false negative exists.

21. The reported result was qualified or rejected because the laboratory did not record the pH value(s) of the sample in a laboratory notebook.
22. The reported value was qualified (J/UJ) because the sample moisture content exceeded 50 percent.
23. The sample result was rejected because the soluble and insoluble matrix spike recoveries were less than 50%.
24. The detected sample result was qualified (J) because the incorrect spike concentration was used.
25. The reported sample results were rejected because the predigestion spike recovery was greater than 150 percent.
26. The reported sample results were rejected because the redigestion spike recovery was greater than 150 percent.
27. The reported value was qualified (J) because the redigestion spike recovery was less than 75 percent.
28. The reported value was qualified (J/UJ) because the sample digestion temperature was less than 90C.
29. In the Field Duplicate Sample Analysis, Hexavalent Chromium fell outside the control limits of $\leq 20\%$ for sample results $> 4xRL$ or $+ RL$ for sample results $< 4xRL$. Therefore, the result was qualified.
30. The reported value was qualified as estimated (J/UJ) but the bias is uncertain due to both high and low MS recoveries.
31. The reported result was greater than the MDL but less than the RL and qualified (J) as estimated by the laboratory.
32. The reported value was qualified because the sample replicate precision criterion of $\leq 20\%$ for method 7199 was exceeded.
33. The reported value was qualified (J/UJ) because the laboratory control sample (LCS) recovery was less than 80%.
34. The reported value was qualified (J) because the laboratory control sample (LCS) recovery was greater than 120%.
35. The reported result was qualified because the matrix spike analysis was not performed at the proper frequency.
36. The reported result was qualified because the laboratory duplicate analysis was not performed at the proper frequency.
37. The result was qualified because the cooler temperature upon sample receipt exceeded 6C.

38. The reported value was qualified because the redigestion spike recovery was greater than 125 percent.
39. The reported result was rejected because the laboratory failed to perform the reanalysis due to insufficient sample volume.
40. The reported results was qualified because the laboratory failed to analyze an ending CCB.
41. The reported result was qualified because the laboratory failed to make the proper method specific pH adjustment.
42. The reported result was rejected because the laboratory failed to reanalyze the MS and associated sample(s) due to failed MS recoveries.

Aqueous Target Analyte Summary Hit List (Hexavalent Chromium)

Site Name PPG Garfield Avenue Supplemental Remedial Investigation (GARIS) Forrest Street
Sampling Date February 24, 2014
Lab Name/ID Accutest, Dayton, NJ
SDG No JB60418
Sample Matrix Groundwater
Trip Blank ID NA
Field Blank ID FS-FB20140224

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/L)	Laboratory Sample Result (mg/L)	Validation Sample Result (mg/L)	RL (mg/L)	Quality Assurance Decision	NJDEP Validation Footnote
FS6GW-20.0-24.0	JB60418-12	CHROMIUM (HEXAVALENT)	U	0.017	0.017	0.010		
FS7GW-10.0-14.0	JB60418-20	CHROMIUM (HEXAVALENT)	U	0.013	0.013	0.010		
FS7GW-20.0-24.0	JB60418-26	CHROMIUM (HEXAVALENT)	U	4.6	4.6	0.50		
FS7GW-30.0-34.0	JB60418-32	CHROMIUM (HEXAVALENT)	U	0.023	0.023	0.010		
FS7GW-40.0-44.0	JB60418-38	CHROMIUM (HEXAVALENT)	U	0.0081B	0.0081	0.010	Qualify	31

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

NJDEP Laboratory Footnote

1. The value reported is less than or equal to 3x the value in the preparation/reagent blank. It is the policy of NJDEP-DPFSR to negate the reported value due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
2. The value reported is greater than three (3) times but less than ten (10) times the value in the preparation/reagent blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to the preparation/reagent blank contamination. The "B" qualifier alerts the end-user to the presence of this analyte in the preparation/reagent blank.
3. The value reported is less than or equal to three (3) times the value in the trip/field blank. It is the policy of NJDEP-DPFSR to negate the reported value as due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.

4. The value reported is greater than three (3) times but less than ten (10) times the value in the trip/field blanks and is considered "real". However, the reported value must be quantitatively qualified "J" due to trip/field blank contamination.
5. The concentration reported by the laboratory is incorrectly calculated.
6. The laboratory failed to report the presence of the analyte in the sample.
7. The reported Hexavalent Chromium value was qualified because the Calibration Check Standard was not within the recovery range (90-110 percent).
8. In the Duplicate Sample Analysis, Hexavalent Chromium fell outside the control limits of ≤ 20 percent for sample results $> 4xRL$ or $+ RL$ for sample results $< 4xRL$. Therefore, the result was qualified.
9. This analyte was rejected because the laboratory performed the Duplicate Analysis on a field blank.
10. The reported value was qualified because the PVS recovery was greater than 115 percent.
11. The reported value was qualified because the PVS recovery was less than 85 percent.
12. The non-detected value was qualified (UJ) because the PVS recovery was less than 85 percent. The possibility of a false negative exists.
13. The reported analyte was qualified because the associated Calibration Blank result was greater than the MDL.
14. The laboratory made a transcription error. No hits were found in the raw data.
15. This analyte is qualified or rejected because the laboratory exceeded the holding time for digestion and/or analysis.
16. The laboratory subtracted the preparation/reagent blank from the sample result. The Reviewer's calculation puts the preparation/reagent blank back into the result.
17. The photocopy is unreadable. Therefore, the QA reviewer cannot read the laboratory's reported concentration result.
18. The reported value was qualified because the predigestion spike recovery was less than 75 %, but greater than 50%.
19. The reported value was qualified because the predigestion spike recovery was greater than 125 percent.

20. The non-detected value was qualified (UJ) because the redigestion spike recovery was less than 75 percent. The possibility of a false negative exists.
21. The reported result was qualified or rejected because the laboratory did not record the pH value(s) of the sample in a laboratory notebook.
22. The reported value was qualified (J/UJ) because the sample moisture content exceeded 50 percent.
23. The sample result was rejected because the soluble and insoluble matrix spike recoveries were less than 50%.
24. The detected sample result was qualified (J) because the incorrect spike concentration was used.
25. The reported sample results were rejected because the predigestion spike recovery was greater than 150 percent.
26. The reported sample results were rejected because the redigestion spike recovery was greater than 150 percent.
27. The reported value was qualified (J) because the redigestion spike recovery was less than 75 percent.
28. The reported value was qualified (J/UJ) because the sample digestion temperature was less than 90C.
29. In the Field Duplicate Sample Analysis, Hexavalent Chromium fell outside the control limits of $\leq 20\%$ for sample results $> 4xRL$ or $+ RL$ for sample results $< 4xRL$. Therefore, the result was qualified.
30. The reported value was qualified as estimated (J/UJ) but the bias is uncertain due to both high and low MS recoveries.
31. The reported result was greater than the MDL but less than the RL and qualified (J) as estimated by the laboratory.
32. The reported value was qualified because the sample replicate precision criterion of $\leq 20\%$ for method 7199 was exceeded.
33. The reported value was qualified (J/UJ) because the laboratory control sample (LCS) recovery was less than 80%.
34. The reported value was qualified (J) because the laboratory control sample (LCS) recovery was greater than 120%.
35. The reported result was qualified because the matrix spike analysis was not performed at the proper frequency.

36. The reported result was qualified because the laboratory duplicate analysis was not performed at the proper frequency.
37. The result was qualified because the cooler temperature upon sample receipt exceeded 6C.
38. The reported value was qualified because the redigestion spike recovery was greater than 125 percent.
39. The reported result was rejected because the laboratory failed to perform the reanalysis due to insufficient sample volume.
40. The reported results was qualified because the laboratory failed to analyze an ending CCB.
41. The reported result was qualified because the laboratory failed to make the proper method specific pH adjustment.
42. The reported result was rejected because the laboratory failed to reanalyze the MS and associated sample(s) due to failed MS recoveries.

Soil Target Analyte Summary Hit List (Metals)

Site Name PPG Garfield Avenue Supplemental Remedial Investigation (GARIS) Forrest Street
Sampling Date February 24, 2014
Lab Name/ID Accutest, Dayton, NJ
SDG No JB60418A
Sample Matrix Soil
Trip Blank ID NA
Field Blank ID FS-FB20140224

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
FS6-0.0-0.5	JB60418-1A	ANTIMONY	U	4.7	4.7	2.5	Qualify	15,24
FS6-0.0-0.5	JB60418-1A	CHROMIUM	0.080	2440	2440	1.2		
FS6-0.0-0.5	JB60418-1A	NICKEL	0.060	299	299	4.9		
FS6-0.0-0.5	JB60418-1A	VANADIUM	0.040	280	280	6.2		
FS6-10.0-10.5	JB60418-7A	ANTIMONY	U	U	U	2.4	Qualify	15,24
FS6-10.0-10.5	JB60418-7A	CHROMIUM	0.080	129	129	1.2		
FS6-10.0-10.5	JB60418-7A	NICKEL	0.060	11.7	11.7	4.9		
FS6-10.0-10.5	JB60418-7A	THALLIUM	U	0.38B	0.38	1.2	Qualify	23
FS6-10.0-10.5	JB60418-7A	VANADIUM	0.040	29.0	29.0	6.1		
FS6-12.0-12.5	JB60418-8A	ANTIMONY	U	U	U	2.5	Qualify	15,24
FS6-12.0-12.5	JB60418-8A	CHROMIUM	0.080	88.7	88.7	1.2		
FS6-12.0-12.5	JB60418-8A	NICKEL	0.060	13.0	13.0	4.9		
FS6-12.0-12.5	JB60418-8A	THALLIUM	U	1.0B	1.0	1.2	Qualify	23
FS6-12.0-12.5	JB60418-8A	VANADIUM	0.040	30.5	30.5	6.1		
FS6-14.0-14.5	JB60418-9A	ANTIMONY	U	U	U	2.4	Qualify	15,24
FS6-14.0-14.5	JB60418-9A	CHROMIUM	0.080	39.6	39.6	1.2		
FS6-14.0-14.5	JB60418-9A	NICKEL	0.060	8.4	8.4	4.7		
FS6-14.0-14.5	JB60418-9A	VANADIUM	0.040	19.8	19.8	5.9		

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
FS6-16.0-16.5	JB60418-10A	ANTIMONY	U	U	U	2.2	Qualify	15,24
FS6-16.0-16.5	JB60418-10A	CHROMIUM	0.080	67.8	67.8	1.1		
FS6-16.0-16.5	JB60418-10A	NICKEL	0.060	12.1	12.1	4.4		
FS6-16.0-16.5	JB60418-10A	VANADIUM	0.040	24.1	24.1	5.5		
FS6-18.0-18.5	JB60418-11A	ANTIMONY	U	U	U	2.3	Qualify	15,24
FS6-18.0-18.5	JB60418-11A	CHROMIUM	0.080	67.3	67.3	1.2		
FS6-18.0-18.5	JB60418-11A	NICKEL	0.060	17.7	17.7	4.6		
FS6-18.0-18.5	JB60418-11A	THALLIUM	U	0.87B	0.87	1.2	Qualify	23
FS6-18.0-18.5	JB60418-11A	VANADIUM	0.040	38.1	38.1	5.8		
FS6-2.0-2.5	JB60418-2A	ANTIMONY	U	3.0	3.0	2.4	Qualify	15,24
FS6-2.0-2.5	JB60418-2A	CHROMIUM	0.080	2190	2190	1.2		
FS6-2.0-2.5	JB60418-2A	NICKEL	0.060	280	280	4.9		
FS6-2.0-2.5	JB60418-2A	VANADIUM	0.040	303	303	6.1		
FS6-4.0-4.5	JB60418-3A	ANTIMONY	U	1.4B	1.4	2.3	Qualify	15,23,24
FS6-4.0-4.5	JB60418-3A	CHROMIUM	0.080	619	619	1.2		
FS6-4.0-4.5	JB60418-3A	NICKEL	0.060	12.0	12.0	4.7		
FS6-4.0-4.5	JB60418-3A	VANADIUM	0.040	16.0	16.0	5.8		
FS6-6.0-6.5	JB60418-4A	ANTIMONY	U	1.1B	1.1	2.0	Qualify	15,23,24
FS6-6.0-6.5	JB60418-4A	CHROMIUM	0.080	930	930	1.0		
FS6-6.0-6.5	JB60418-4A	NICKEL	0.060	17.8	17.8	4.0		
FS6-6.0-6.5	JB60418-4A	VANADIUM	0.040	19.3	19.3	5.0		
FS6-8.0-8.5	JB60418-5A	ANTIMONY	U	U	U	2.5	Qualify	15,24
FS6-8.0-8.5	JB60418-5A	CHROMIUM	0.080	182	182	1.2		
FS6-8.0-8.5	JB60418-5A	NICKEL	0.060	10.8	10.8	5.0		
FS6-8.0-8.5	JB60418-5A	THALLIUM	U	0.62B	0.62	1.2	Qualify	23

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
FS6-8.0-8.5	JB60418-5A	VANADIUM	0.040	23.3	23.3	6.2		
FS7-0.0-0.5	JB60418-14A	ANTIMONY	U	1.8B	1.8	2.4	Qualify	15,23,24
FS7-0.0-0.5	JB60418-14A	CHROMIUM	0.080	732	732	1.2		
FS7-0.0-0.5	JB60418-14A	NICKEL	0.060	89.6	89.6	4.9		
FS7-0.0-0.5	JB60418-14A	THALLIUM	U	0.78B	0.78	1.2	Qualify	23
FS7-0.0-0.5	JB60418-14A	VANADIUM	0.040	83.9	83.9	6.1		
FS7-10.0-10.5	JB60418-21A	ANTIMONY	U	0.94B	0.94	2.5	Qualify	15,23,24
FS7-10.0-10.5	JB60418-21A	CHROMIUM	0.19	138	138	1.2		
FS7-10.0-10.5	JB60418-21A	NICKEL	U	20.3	20.3	5.0		
FS7-10.0-10.5	JB60418-21A	VANADIUM	U	26.9	26.9	6.2		
FS7-12.0-12.5	JB60418-22A	ANTIMONY	U	0.60B	0.60	2.4	Qualify	15,23,24
FS7-12.0-12.5	JB60418-22A	CHROMIUM	0.19	79.2	79.2	1.2		
FS7-12.0-12.5	JB60418-22A	NICKEL	U	9.4	9.4	4.8		
FS7-12.0-12.5	JB60418-22A	VANADIUM	U	23.4	23.4	6.0		
FS7-14.0-14.5	JB60418-23A	ANTIMONY	U	0.65B	0.65	2.3	Qualify	15,23,24
FS7-14.0-14.5	JB60418-23A	CHROMIUM	0.19	123	123	1.1		
FS7-14.0-14.5	JB60418-23A	NICKEL	U	14.6	14.6	4.6		
FS7-14.0-14.5	JB60418-23A	VANADIUM	U	25.6	25.6	5.7		
FS7-16.0-16.5	JB60418-24A	ANTIMONY	U	0.84B	0.84	2.2	Qualify	15,23,24
FS7-16.0-16.5	JB60418-24A	CHROMIUM	0.19	60.3	60.3	1.1		
FS7-16.0-16.5	JB60418-24A	NICKEL	U	20.6	20.6	4.5		
FS7-16.0-16.5	JB60418-24A	VANADIUM	U	27.2	27.2	5.6		
FS7-18.0-18.5	JB60418-25A	ANTIMONY	U	0.59B	0.59	2.5	Qualify	15,23,24
FS7-18.0-18.5	JB60418-25A	CHROMIUM	0.19	34.3	34.3	1.2		
FS7-18.0-18.5	JB60418-25A	NICKEL	U	8.5	8.5	4.9		

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
FS7-18.0-18.5	JB60418-25A	VANADIUM	U	20.3	20.3	6.1		
FS7-2.0-2.5	JB60418-15A	ANTIMONY	U	2.9	2.9	2.3	Qualify	15,24
FS7-2.0-2.5	JB60418-15A	CHROMIUM	0.080	18.4	18.4	1.1		
FS7-2.0-2.5	JB60418-15A	NICKEL	0.060	31.5	31.5	4.6		
FS7-2.0-2.5	JB60418-15A	VANADIUM	0.040	22.3	22.3	5.7		
FS7-2.0-2.5X	JB60418-16A	ANTIMONY	U	9.3	9.3	2.4	Qualify	15,24
FS7-2.0-2.5X	JB60418-16A	CHROMIUM	0.080	16.0	16.0	1.2		
FS7-2.0-2.5X	JB60418-16A	NICKEL	0.060	29.1	29.1	4.7		
FS7-2.0-2.5X	JB60418-16A	VANADIUM	0.040	21.8	21.8	5.9		
FS7-20.0-20.5	JB60418-27A	ANTIMONY	U	0.70B	0.70	2.3	Qualify	15,23,24
FS7-20.0-20.5	JB60418-27A	CHROMIUM	0.19	43.1	43.1	1.1		
FS7-20.0-20.5	JB60418-27A	NICKEL	U	8.9	8.9	4.6		
FS7-20.0-20.5	JB60418-27A	VANADIUM	U	23.1	23.1	5.7		
FS7-22.0-22.5	JB60418-28A	ANTIMONY	U	0.42B	0.42	2.4	Qualify	15,23,24
FS7-22.0-22.5	JB60418-28A	CHROMIUM	0.19	44.7	44.7	1.2		
FS7-22.0-22.5	JB60418-28A	NICKEL	U	6.0	6.0	4.8		
FS7-22.0-22.5	JB60418-28A	VANADIUM	U	15.9	15.9	6.0		
FS7-24.0-24.5	JB60418-29A	ANTIMONY	U	U	U	2.6	Qualify	15,24
FS7-24.0-24.5	JB60418-29A	CHROMIUM	0.19	116	116	1.3		
FS7-24.0-24.5	JB60418-29A	NICKEL	U	5.4	5.4	5.3		
FS7-24.0-24.5	JB60418-29A	VANADIUM	U	14.5	14.5	6.6		
FS7-26.0-26.5	JB60418-30A	ANTIMONY	U	0.33B	0.33	2.4	Qualify	15,23,24
FS7-26.0-26.5	JB60418-30A	CHROMIUM	0.19	43.8	43.8	1.2		
FS7-26.0-26.5	JB60418-30A	NICKEL	U	7.1	7.1	4.7		
FS7-26.0-26.5	JB60418-30A	VANADIUM	U	16.6	16.6	5.9		

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
FS7-28.0-28.5	JB60418-31A	ANTIMONY	U	U	U	2.6	Qualify	15,24
FS7-28.0-28.5	JB60418-31A	CHROMIUM	0.19	10.6	10.6	1.3		
FS7-28.0-28.5	JB60418-31A	NICKEL	U	5.2B	5.2	5.3	Qualify	23
FS7-28.0-28.5	JB60418-31A	VANADIUM	U	14.8	14.8	6.6		
FS7-30.0-30.5	JB60418-33A	ANTIMONY	U	0.51B	0.51	2.6	Qualify	15,23,24
FS7-30.0-30.5	JB60418-33A	CHROMIUM	0.19	16.3	16.3	1.3		
FS7-30.0-30.5	JB60418-33A	NICKEL	U	11.3	11.3	5.2		
FS7-30.0-30.5	JB60418-33A	VANADIUM	U	18.7	18.7	6.5		
FS7-32.0-32.5	JB60418-34A	ANTIMONY	U	0.44B	0.44	2.5	Qualify	15,23,24
FS7-32.0-32.5	JB60418-34A	CHROMIUM	0.19	18.1	18.1	1.2		
FS7-32.0-32.5	JB60418-34A	NICKEL	U	8.6	8.6	4.9		
FS7-32.0-32.5	JB60418-34A	VANADIUM	U	15.2	15.2	6.2		
FS7-34.0-34.5	JB60418-35A	ANTIMONY	U	0.40B	0.40	2.5	Qualify	15,23,24
FS7-34.0-34.5	JB60418-35A	CHROMIUM	0.19	10.5	10.5	1.2		
FS7-34.0-34.5	JB60418-35A	NICKEL	U	7.2	7.2	5.0		
FS7-34.0-34.5	JB60418-35A	VANADIUM	U	15.9	15.9	6.2		
FS7-36.0-36.5	JB60418-36A	ANTIMONY	U	0.40B	0.40	2.4	Qualify	15,23,24
FS7-36.0-36.5	JB60418-36A	CHROMIUM	0.19	12.8	12.8	1.2		
FS7-36.0-36.5	JB60418-36A	NICKEL	U	10.1	10.1	4.8		
FS7-36.0-36.5	JB60418-36A	THALLIUM	U	0.53B	0.53	1.2	Qualify	23
FS7-36.0-36.5	JB60418-36A	VANADIUM	U	17.6	17.6	6.0		
FS7-38.0-38.5	JB60418-37A	ANTIMONY	U	0.44B	0.44	2.4	Qualify	15,23,24
FS7-38.0-38.5	JB60418-37A	CHROMIUM	0.19	10.4	10.4	1.2		
FS7-38.0-38.5	JB60418-37A	NICKEL	U	6.2	6.2	4.9		
FS7-38.0-38.5	JB60418-37A	VANADIUM	U	17.3	17.3	6.1		

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
FS7-4.0-4.5	JB60418-17A	ANTIMONY	U	3.8	3.8	2.6	Qualify	15,24
FS7-4.0-4.5	JB60418-17A	CHROMIUM	0.19	16.5	16.5	1.3		
FS7-4.0-4.5	JB60418-17A	NICKEL	U	16.0	16.0	5.2		
FS7-4.0-4.5	JB60418-17A	VANADIUM	U	19.0	19.0	6.5		
FS7-40.0-40.5	JB60418-39A	ANTIMONY	U	0.33B	0.33	2.5	Qualify	15,23,24
FS7-40.0-40.5	JB60418-39A	CHROMIUM	0.19	8.9	8.9	1.3		
FS7-40.0-40.5	JB60418-39A	NICKEL	U	6.3	6.3	5.1		
FS7-40.0-40.5	JB60418-39A	VANADIUM	U	13.9	13.9	6.3		
FS7-6.0-6.5	JB60418-18A	ANTIMONY	U	0.92B	0.92	2.5	Qualify	15,23,24
FS7-6.0-6.5	JB60418-18A	CHROMIUM	0.19	1260	1260	1.2		
FS7-6.0-6.5	JB60418-18A	NICKEL	U	16.8	16.8	4.9		
FS7-6.0-6.5	JB60418-18A	VANADIUM	U	22.7	22.7	6.1		
FS7-8.0-8.5	JB60418-19A	ANTIMONY	U	1.4B	1.4	2.7	Qualify	15,23,24
FS7-8.0-8.5	JB60418-19A	CHROMIUM	0.19	414	414	1.3		
FS7-8.0-8.5	JB60418-19A	NICKEL	U	13.4	13.4	5.4		
FS7-8.0-8.5	JB60418-19A	VANADIUM	U	41.5	41.5	6.7		

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

NJDEP Laboratory Footnote

1. The value reported is less than or equal to 3x the value in the method blank. It is the policy of NJDEP-DPFSR to negate the reported value due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
2. The value reported is greater than three (3) but less than ten (10) times the value in the method blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to the method blank contamination. The "B" qualifier alerts the end-user to the presence of this analyte in the method blank.

3. The value reported is less than or equal to 3x the value in the trip/field blank. It is the policy of NJDEP-DPFSR to negate the reported value as due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
4. The value reported is greater than 3x but less than ten (10) the value in the trip/field blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to trip/field blank contamination.
5. The concentration reported by the laboratory is incorrectly calculated.
6. The laboratory failed to report the presence of the analyte in the sample.
7. The reported metal value was qualified because the Calibration Verification Standard was not within the recovery range (90-110 percent).
8. In the MS/MSD Sample Analysis, this analyte fell outside the control limits of 20% RPD. Therefore, the result was qualified.
9. This analyte was qualified because the laboratory performed the MS/MSD Analysis on a field blank.
10. The reported analyte was qualified because the associated Calibration Blank result was greater than the MDL.
11. The reported value was qualified because serial dilution analysis was not within QC limit of 10% D.
12. This analyte is rejected because the laboratory exceeded the holding time for digestion and analysis.
13. The laboratory subtracted the method blank from the sample result. The reviewer's calculation has added the method blank result to the reported concentration.
14. The photocopy submitted is illegible. Therefore, the QA reviewer cannot read the laboratory's reported concentration result.
15. The reported or nondetected value was qualified because the MS/MSD spike recovery was less than 75 percent.
16. The reported value was qualified because the MS/MSD spike recovery was greater than 125 percent.
17. The reported value was qualified as estimated (J/UJ) but the bias is uncertain due to both high and low MS recoveries.
18. The reported values were qualified because the laboratory duplicate exceeded 35 percent RPD for results greater than 5X the reporting limit or the absolute difference exceeded two times the reporting limit for sample result less than 5 times the reporting limit.

19. The reported value was qualified because the field duplicate exceeded 35 percent RPD for results greater than 5X the reporting limit or the absolute difference exceeded two times the reporting limit for sample result less than 5 times the reporting limit.
20. The reported value was qualified because the LCS recovery was less than 80 percent.
21. The reported value was qualified because the sample moisture content was greater than 50 percent.
22. The reported value was rejected because the field duplicate absolute difference was greater than 4 times the RL or the RPD was greater than 120%.
23. The reported result was greater than the MDL but less than the RL and qualified (J) as estimated by the laboratory.
24. The field duplicate absolute difference exceeded two times the reporting limit for sample result less than 5 times the reporting limit.
25. The reported value was qualified because the LCS recovery was greater than 120 percent.

Aqueous Target Analyte Summary Hit List (Metals)

Site Name PPG Garfield Avenue Supplemental Remedial Investigation (GARIS) Forrest Street
Sampling Date February 24, 2014
Lab Name/ID Accutest, Dayton, NJ
SDG No JB60418A
Sample Matrix Groundwater
Trip Blank ID NA
Field Blank ID NA

Field Sample ID	Lab Sample ID	Analyte	Method Blank (ug/L)	Laboratory Sample Result (ug/L)	Validation Sample Result (ug/L)	RL (ug/L)	Quality Assurance Decision	NJDEP Validation Footnote
FS6GW-10.0-14.0	JB60418-6A	CHROMIUM	U	4660	4660	100		
FS6GW-20.0-24.0	JB60418-12A	CHROMIUM	U	6570	6570	100		
FS7GW-10.0-14.0	JB60418-20A	CHROMIUM	U	7070	7070	100		
FS7GW-20.0-24.0	JB60418-26A	CHROMIUM	U	26600	26600	100		
FS7GW-30.0-34.0	JB60418-32A	CHROMIUM	U	10000	10000	100		
FS7GW-40.0-44.0	JB60418-38A	CHROMIUM	U	17300	17300	100		

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

NJDEP Laboratory Footnote

1. The value reported is less than or equal to 3x the value in the method blank. It is the policy of NJDEP-DPFSR to negate the reported value due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
2. The value reported is greater than three (3) but less than ten (10) times the value in the method blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to the method blank contamination. The "B" qualifier alerts the end-user to the presence of this analyte in the method blank.
3. The value reported is less than or equal to 3x the value in the trip/field blank. It is the policy of NJDEP-DPFSR to negate the reported value as due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.

4. The value reported is greater than 3x but less than ten (10) the value in the trip/field blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to trip/field blank contamination.
5. The concentration reported by the laboratory is incorrectly calculated.
6. The laboratory failed to report the presence of the analyte in the sample.
7. The reported metal value was qualified because the Calibration Verification Standard was not within the recovery range (90-110 percent).
8. In the MS/MSD Sample Analysis, this analyte fell outside the control limits of 20% RPD. Therefore, the result was qualified.
9. This analyte was qualified because the laboratory performed the MS/MSD Analysis on a field blank.
10. The reported analyte was qualified because the associated Calibration Blank result was greater than the MDL.
11. The reported value was qualified because serial dilution analysis was not within QC limit of 10% D.
12. This analyte is rejected because the laboratory exceeded the holding time for digestion and analysis.
13. The laboratory subtracted the method blank from the sample result. The reviewer's calculation has added the method blank result to the reported concentration.
14. The photocopy submitted is illegible. Therefore, the QA reviewer cannot read the laboratory's reported concentration result.
15. The reported or nondetected value was qualified because the MS/MSD spike recovery was less than 75 percent.
16. The reported value was qualified because the MS/MSD spike recovery was greater than 125 percent.
17. The reported value was qualified as estimated (J/UJ) but the bias is uncertain due to both high and low MS recoveries.
18. The reported values were qualified because the laboratory duplicate exceeded 35 percent RPD for results greater than 5X the reporting limit or the absolute difference exceeded two times the reporting limit for sample result less than 5 times the reporting limit.
19. The reported value was qualified because the field duplicate exceeded 35 percent RPD for results greater than 5X the reporting limit or the absolute difference exceeded two times the reporting limit for sample result less than 5 times the reporting limit.

20. The reported value was qualified because the LCS recovery was less than 80 percent.
21. The reported value was qualified because the sample moisture content was greater than 50 percent.
22. The reported value was rejected because the field duplicate absolute difference was greater than 4 times the RL or the RPD was greater than 120%.
23. The reported result was greater than the MDL but less than the RL and qualified (J) as estimated by the laboratory.
24. The field duplicate absolute difference exceeded two times the reporting limit for sample result less than 5 times the reporting limit.
25. The reported value was qualified because the LCS recovery was greater than 120 percent.

Attachment B

Data Validation Report Form

Client Name: PPG Industries	Project Number: 60154801.6001A
Site Location: PPG Garfield Avenue Supplemental Remedial Investigation (GARIS) Forrest Street Groundwater and Soil, Jersey City, NJ	Project Manager: William Spronz
Laboratory: Accutest, Dayton, NJ	Type of Validation: Full
Laboratory Job No: JB60418	Date Checked: 4/16/14
Validator: Paula DiMattei	Peer: Lisa Krowitz

ITEM	YES	NO	N/A	COMMENTS
Sample results included?	X			
Reporting Limits met project requirements?	X			
Field I.D. included?	X			
Laboratory I.D. included?	X			
Sample matrix included?	X			
Sample receipt temperature 2-6C?		X		One cooler temp was 1°C. No actions required.
Signed COCs included?	X			
Date of sample collection included?	X			
Date of sample digestion included?	X			
Holding time to digestion met criteria? (Soils -30 days from collection to digestion.)	X			
Date of analysis included?	X			
Holding time to analysis met criteria? (Soils -168 hours from digestion to analysis; Aqueous - 24 hours from collection to analysis.)	X			
Method reference included?	X			
Laboratory Case Narrative included?	X			

Definitions: MDL Method Detection Limit; %R Percent Recovery; RL Reporting Limit; RPD Relative Percent Difference; RSD Relative Standard Deviation :Corr Correlation Coefficient.

ITEM	YES	NO	N/A	COMMENTS
Initial calibration documentation included in lab package?	X			
1) Blank plus 4 standards (7196A) or blank plus 3 standards (7199)	X			
2) Correlation coefficient of =0.995 (7196A) or =0.999 (7199)	X			
3) Calibrate daily or each time instrument is set up.	X			
Calibration Check Standard (CCS) for 7196A and Quality Control Sample (QCS) for 7199 Included in Lab Package?	X			
1) %R criteria met? (90 - 110%)	X			
2) Correct frequency of one per every 10 samples	X			
3) CCS and QCS from independent source and at mid-level of calibration curve	X			
Calibration Blanks	X			
1) Analyzed prior to initial calibration standards and after each CCS/QCS?	X			
2) Absolute value should not exceed MDL.	X			
Method Blank, Field Blanks and/or Equipment Blanks Included in Lab Package?	X			FS-FB20140224
1) Method blank analyzed with each preparation batch?	X			
2) Absolute value should not exceed MDL.	X			
Eh and pH Data	X			
1) Eh and pH data was included and plotted for all samples?	X			
Soluble Matrix Spike Data Included in Lab Package?	X			
1) Soluble Matrix %R criteria met? (75-125%R).	X			
2) Was the spike concentration 40 mg/Kg or twice the sample concentration?	X			
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	X			
Insoluble Matrix Spike Data Included in Lab Package?	X			
1) Insoluble Matrix %R criteria met? (75-125%R).	X			
2) Was the spike concentration around 400 to 800 mg/Kg?	X			
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	X			

ITEM	YES	NO	N/A	COMMENTS
Post Digestion Spike	X			
1) Post Digestion Spike %R criteria met? (85-115%R).	X			
2) Was the spike concentration 40 mg/Kg or twice the sample concentration?	X			
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	X			
Sample Duplicate Data Included in Lab Package?	X			Aqueous: FS6GW-10.0-14.0; Soil: FS6-6.0-6.5 and FS7-36.0-36.5
1) RPD criteria met? (RPD ≤20%) if both results are ≤4x RL or absolute difference ≤RL if either or both results are <4xRL.	X			
2) Was a sample duplicate analyzed at the frequency of 1 per batch or 20 samples?	X			
Was a Laboratory Control Sample (LCS) Included in Lab Package?	X			
1) %R criteria met? (80-120%R).	X			
2) Was an LCS analyzed at the frequency of 1/batch or 20 samples?	X			
Were any Field Duplicate samples submitted with this SDG?	X			FS7-2.0-2.5 and FS7-2.0-2.5X
1) Were Field duplicate RPD criteria met? (RPD≤20% for both sample results >4xRL or absolute difference ≤ RL if either or both results are <4xRL.			X	Both samples were ND; precision deemed acceptable
Were all sample quantitation and reporting requirements met?	X			
1) Were all solid samples reported with percent solids > 50% ?	X			
2) Were any samples analyzed or reported with dilutions?	X			
Miscellaneous Items	X			
1) For soils by 7196A, was the pH within a range of 7.0-8.0?	X			
2) For soils by 7199, was the pH within a range of 9.0-9.5?			X	
3) For aqueous by 7196A, was the pH with a range of 1.5-2.5?	X			
4) For soils (3060A), was the digestion temperature 90-95C for at least 60 minutes?	X			
5) For 7199, was each sample injected twice and was the RPD =20?			X	

SDG#: JB60418
Batch: GN290
 Cr+6 ICAL 02/28/14
 Soil
 (p. 121 of data pkg)

x - concentration	y - response
0	0
0.01	0.009
0.05	0.044
0.1	0.088
0.3	0.264
0.5	0.441
0.8	0.689
1	0.884

(p. 121 of data pkg)

AECOM Calculated Intercept	0.0001	OK	Reported intercept	0.00010
AECOM Slope	0.8760	OK	Reported Slope	0.8760
AECOM Calculated r	0.99987	OK	Reported r	0.99987

LCS calculation

GP78165-B1 p.121

Background Absorbance	0
Total absorbance	0.864
Total absorbance - background	0.864
Instrument Concentration	0.986
Sample weight (mg/kg)	0.0025
Final Volume (L)	0.1
Dilution Factor	1

AECOM Calculated LCS Result (mg/Kg)	39.4	OK	Reported Result (mg/Kg)	39.4
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%R = Found/True*100

p. 91

True Value (mg/kg)	40
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AECOM Calculated %R	98.6	OK rounding	Reported %R	98.5
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MS calculation

JB60418-4 [FS6-6.0-6.5] pg. 121

Background reading	0
Total absorbance	0.408
Total absorbance - background	0.408
Instrument Concentration	0.4656
Sample weight (mg/kg)	0.00249
Final Volume (L)	0.1
Percent solids	0.727
Dilution Factor	50

AECOM Calculated MS Result (mg/Kg)	1290	OK	Reported Result (mg/Kg)	1290
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%R = Found/True*100

JB60418-4 [FS6-6.0-6.5] pg. 93

True Value (mg/kg)	1140
Native concentration (mg/Kg)	42.7

AECOM%R	109.1	OK rounding	Reported %R	109.6
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Percent Solids

JB60418-4 [FS6-6.0-6.5] pg. 94

Empty dish weight=	20.53
Wet weight=	27.31
Dry weight=	25.46

AECOM%solids =	72.7	OK	reported %solids=	72.7
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Reporting Limit**JB60418-4 [FS6-6.0-6.5] pg. 21**

Low Standard	0.01		
Initial weight (mg/kg)	0.00243		
Final volume (L)	0.1		
Percent solids	0.727		
Dilution Factor	1		
Reporting Limit	0.57	OK rounding	Reported RL (mg/Kg)= 0.55

Sample Calculations**JB60418-4 [FS6-6.0-6.5] pg. 21, 121**

Background reading	0		
Total absorbance	0.661		
Total absorbance - background	0.661		
Instrument Response	0.754		
Sample weight (mg/kg)	0.00243		
Final Volume (L)	0.1		
Percent solids	0.727		
Dilution Factor	1		
AECOM Calculated Result (mg/Kg)	42.7	OK	Reported Result (mg/Kg) 42.7

JB60418-1 [FS6-0.0-0.5] pg. 18, 121

Background reading	0		
Total absorbance	0.579		
Total absorbance - background	0.579		
Instrument Response	0.661		
Sample weight (mg/kg)	0.00252		
Final Volume (L)	0.1		
Percent solids	0.835		
Dilution Factor	1		
AECOM Calculated Result (mg/Kg)	31.4	OK	Reported Result (mg/Kg) 31.4

JB60418-2 [FS6-2.0-2.5] pg. 19, 121

Background reading	0		
Total absorbance	0.332		
Total absorbance - background	0.332		
Instrument Response	0.379		
Sample weight (mg/kg)	0.00249		
Final Volume (L)	0.1		
Percent solids	0.854		
Dilution Factor	1		
AECOM Calculated Result (mg/Kg)	17.8	OK	Reported Result (mg/Kg) 17.8

Client Name: PPG Industries	Project Number: 60154801.6001A
Site Location: PPG Garfield Avenue Supplemental Remedial Investigation (GARIS) Forrest Street Groundwater and Soil, Jersey City, NJ	Project Manager: William Spronz
Laboratory: Accutest, Dayton, NJ	Type of Validation: Limited
Laboratory Job No: JB60418A	Date Checked: 4/16/14
Validator: Paula DiMattei	Peer: Lisa Krowitz

ITEM	YES	NO	N/A	COMMENTS
Sample results included?	X			
Reporting Limits met project requirements?	X			
Field I.D. included?	X			
Laboratory I.D. included?	X			
Sample matrix included?	X			
Sample receipt temperature 2-6C?		X		One cooler temp was at 1°C. No actions required.
Signed COCs included?	X			
Date of sample collection included?	X			
Date of sample digestion included?	X			
Date of analysis included?	X			
Holding time met QC criteria? (Metals -180 days from sample collection; Mercury - 28 days from sample collection. If HT exceeded by 10 days R all results.	X			
Method reference included?	X			
Laboratory Case Narrative included?	X			

Definitions: MDL Method Detection Limit; %R Percent Recovery; RL Reporting Limit; RPD Relative Percent Difference; RSD Relative Standard Deviation :Corr Correlation Coefficient.

ITEM	YES	NO	N/A	COMMENTS
Sample dilutions?		X		
Initial calibration documentation included in lab package?			X	NA for a Limited Review
1) Calibrate daily or each time instrument is set up.			X	
2) ICP (6010) -Blank plus 1 standard? If no, reject (R) data.			X	
3) Hg (7470/7471) -Blank plus 5 standards? If no, reject (R) data.			X	
Initial Calibration Verification Standard (ICV) for ICP (6010) and Initial Calibration Check Standard (ICCS) for Hg (7470/7471) included in lab package?			X	
1) Analyzed immediately after initial calibration? If no, reject (R) data.			X	
2) %R criteria met? (90-110%). If no, J positive results for affected analyte(s) if %R between 80-89% and 111-120% and indicate bias; UJ non-detect results for affected analyte(s) if %R between 80-89% , and R all data for affected analyte(s) if %R 120%.			X	
3) Spot check ICV/ICCS results for several analytes.			X	
Continuing Calibration Verification Standard (CCV) for ICP (6010) and Calibration Check Standard (CCS) for Hg (7470/7471) included in Lab Package?			X	
1) Analyzed immediately after each ICV/ICC/CB and after every 10 samples? If no, reject (R) data.			X	
2) CCS and CCV from independent source and at mid-level of calibration curve. If no, reject (R) data.			X	
3) %R criteria met? (90-110%R). If no, J positive results for affected analyte(s) if %R between 80-89% and 111-120% and indicate bias; UJ non-detect results for affected analyte(s) if %R between 80-89% and R all data for affected analyte(s) if %R 120%.			X	
4) Spot check CCV/CCS results for several analytes.			X	
Low Calibration Standard (CRI) included in Lab Package?			X	
1) %R criteria met? - 50-150% for Co, Mn, Zn, by ICP-MS; Pb, Tl by 6010; 70-130% all others. If no, refer to ILM05.4 NJ SOP 5.A.2 for actions.			X	

ITEM	YES	NO	N/A	COMMENTS
Calibration Blanks			X	NA for a Limited review
1) Analyzed after daily calibration and after each ICV/ICC/CCV/CCS and after every 10 samples? If no, reject (R) data.			X	
2) Absolute value 10xCB result, no qualification.			X	
Method Blank Included in Lab Package?	X			
1) Method blank analyzed with each preparation batch or every SDG, or 1/20 samples? If no, reject (R) data, except no aqueous MB required for FB/EB if only soil samples were analyzed.	X			
2) Method blank analyzed 1/20 samples? If - MB 1/25, J sample results from 21-25; -MB >1/25, R sample results after 25th sample.	X			
3) MB results nondetect? If no, -sample result 3xMB but 10xMB, no qualification.		X		See nonconformance table below.
4) Negative MB result reported? If yes, -Positive sample result				
Field Blanks/Equipment Blanks Included in Lab Package?	X			FS-FB20140224
1) FB/EB result non-detect? If no, -sample result 3xFB/EB but 10xFB/EB, no qualification.	X			
ICP Interference Check Sample (ICS) included in Lab Package?			X	NA for a Limited Review
1) Analyzed at beginning of analytical run? If no, reject (R) data.			X	
2) %R criteria met? (80-120%) If no, %R>120%, no qualification if sample result non-detect; %R between 121-150%, J positive results, biased high; %R between 50-79%, J/UJ results, biased low; %R150%, reject (R) result			X	
3) Spot check accuracy of %Rs			X	
Matrix Spike/Matrix Spike Duplicate Data Included in Lab Package?	X			
1) MS/MSD %R (75-125%R) and RPD (+20%) criteria met? - %R>125% J positive results for affected analyte(s) for all samples in the same batch/SDG, accept NDs; -%R		X		See nonconformance table below.
2) Was a sample spiked at the frequency of 1/batch or 20 samples?	X			
3) Was the MS performed on a site sample?	X			Batch QC also provided but was not assessed.
4) Was the MS performed on a FB/EB or TB? If yes, J all sample data.		X		

ITEM	YES	NO	N/A	COMMENTS
Post Digestion Spike			X	
1) %R criteria met? (75-125%R) - %R>125% J positive results for affected analyte(s) for all samples in the same batch/SDG, accept NDs.; - %R			X	NA for a Limited Review
2) Was the spike performed on a FB/EB or TB? If yes, J all sample data.			X	
3) Was a sample spiked at the frequency of 1/batch or 20 samples?			X	
Laboratory Duplicate Data Included in Lab Package?		X		MS/MSD analyses were performed in lieu of laboratory duplicate analysis.
Aqueous - If RPD is >20% but 5x the QL, estimate (J) results >the QL. - If RPD is >100%, reject R results >= the QL.- If sample and/or duplicate is the QL, estimate (J) positive results 2x the QL, reject R non-detects and positive results			X	
Soil - If RPD is >35% but 5x the QL, estimate (J) results > the QL. - If RPD is >120%, reject results > the QL. - If sample and/or duplicate is 2x the QL, estimate (J) positive results 4x the QL, reject nondetects and positive results			X	
Was a Laboratory Control Sample (LCS) Included in Lab Package?	X			
1) LCS %R criteria met? (80-120%R). If no, J/UJ all affected analytes(s) for all samples in the same batch/SDG.	X			
2) Was an LCS analyzed at the frequency of 1/batch or 20 samples? If no, J/UJ affected analyte(s) for all samples in the same batch/SDG.	X			
Serial Dilution			X	NA for a Limited Review
1) %D(25xIDL (7000) or >10xIDL (6010) and %D >10% J positive results for affected analyte(s) for all samples in the same batch/SDG, accept NDs.			X	
2) Was the frequency 1/batch or 20 samples?			X	
3) Was a site sample used?			X	
4) Was a FB/EB or TB used? If yes, J all sample data.			X	
5) Spot check accuracy of %Ds.			X	

ITEM	YES	NO	N/A	COMMENTS
Field Duplicate Data included in Lab Package?	X			
Aqueous - If RPD is >20% but 5x the QL, estimate (J) results > the QL. - If RPD is >100%, reject R results >= the QL. - If sample and/or duplicate is the QL, estimate (J) positive results 2x the QL, reject R non-detects and positive results			X	
Soil - If RPD is >35% but 5x the QL, estimate (J) results > the QL. - If RPD is >120%, reject results > the QL. - If sample and/or duplicate is 2x the QL, estimate (J) positive results 4x the QL, reject nondetects and positive results		X		See nonconformance table below
Percent Solids data included in Lab Package?	X			
1) %Solids criteria (Reg 2 criteria) met? (>=50%)	X			

Laboratory Blanks

Blank ID	Analyte	Result	QL	Units	Associated Samples
MP77954-MB1	Chromium	0.080	0.50	mg/kg	FS6-0.0-0.5 FS6-10.0-10.5 FS6-12.0-12.5 FS6-14.0-14.5 FS6-16.0-16.5 FS6-18.0-18.5 FS6-2.0-2.5 FS6-4.0-4.5 FS6-6.0-6.5 FS6-8.0-8.5 FS7-0.0-0.5 FS7-2.0-2.5 FS7-2.0-2.5X
MP77954-MB1	Nickel	0.060	2.0	mg/kg	
MP77954-MB1	Vanadium	0.040	2.5	mg/kg	
MP77955-MB1	Chromium	0.19	1.0	mg/kg	FS7-10.0-10.5 FS7-14.0-14.5 FS7-16.0-16.5 FS7-18.0-18.5 FS7-20.0-20.5 FS7-22.0-22.5 FS7-24.0-24.5 FS7-26.0-26.5 FS7-28.0-28.5 FS7-30.0-30.5 FS7-32.0-32.5 FS7-34.0-34.5 FS7-36.0-36.5 FS7-38.0-38.5 FS7-4.0-4.5 FS7-40.0-40.5 FS7-6.0-6.5 FS7-8.0-8.5

Matrix Spikes

Sample ID	Analyte	Batch	MS % Recovery	MSD % Recovery	Lower Limit	Upper Limit	RPD	RPD Limit
FS7-36.0-36.5	Antimony	MP77955	64.8	68.4	75	125	ok	20

Field Duplicates

Sample ID	Duplicate ID	Analyte	Sample Result	Qual	Duplicate Result	Qual	QL	Units	RPD
FS7-2.0-2.5	FS7-2.0-2.5X	Antimony	2.9		9.3		2.3	mg/kg	105

Data Validation Report

Project:	PPG Garfield Avenue Supplemental Remedial Investigation (GARIS) Forrest Street Groundwater and Soil	
Laboratory:	Accutest, Dayton, NJ	
Laboratory Job No.:	JB60544 and JB60544A	
Analysis/Method:	Hexavalent Chromium SW846 3060A/7196 Metals by ICP-AES/ SW846-6010	
Validation Level:	Full (Hexavalent Chromium) Limited (Metals)	
Site Location/Address:	Forrest Street, Jersey City, NJ	
AECOM Project No:	60154801.6001A	
Prepared by:	Paula DiMattei /AECOM	Completed on: 04/16/2014
Reviewed by:	Lisa Krowitz /AECOM	File Name: JB60544_A_2014-04-17_DV Report-F

Introduction

The data were reviewed in accordance with the FSP-QAPP and the following NJDEP validation Standard Operating Procedures (SOP):

- NJDEP Office of Data Quality SOP 5.A.10, Rev 3 (September 2009), SOP for Analytical Data Validation of Hexavalent Chromium - for USEPA SW-846 Method 3060A, USEPA SW-846 Method 7196A and USEPA SW-846 Method 7199;
- NJDEP Office of Data Quality SOP 5.A.16, Rev 1 (May 2002), Quality Assurance Data Validation of Analytical Deliverables for Inorganics (based on USEPA SW-846 Methods)

The results of quality control data analyzed with site samples were used to assess the overall reliability of the data. The following qualifiers were used to identify data quality issues:

- U: Indicates the analyte was not detected in the sample above the sample reporting limit.
- J: Indicates the result was an estimated value; the associated numerical value was an approximate concentration of the analyte in the sample.
- UJ: Indicates the analyte was not detected above the reporting limit and the reporting limit was approximate.
- R: The sample result was rejected due to serious deficiencies; the presence or absence of the analyte could not be confirmed.
- RA: The sample result was rejected but is still considered usable.

Sample Information

The samples listed below were collected by AECOM on February 25, 2014 as part of the PPG Garfield Avenue Supplemental Remedial Investigation (GARIS) Forrest Street Groundwater and Soil sampling at the PPG Forrest Street site, Jersey City, NJ. Only the samples and parameters listed below were validated.

Field ID	Laboratory ID	Matrix	Fraction
FS6-20.0-20.5	JB60544-1	Soil	Hexavalent Chromium
FS6-20.0-20.5	JB60544-1A	Soil	Metals
FS6-22.0-22.5	JB60544-2	Soil	Hexavalent Chromium
FS6-22.0-22.5	JB60544-2A	Soil	Metals
FS6-24.0-24.5	JB60544-3	Soil	Hexavalent Chromium
FS6-24.0-24.5	JB60544-3A	Soil	Metals
FS6-24.0-24.5X (Field Duplicate of FS6-24.0-24.5)	JB60544-4	Soil	Hexavalent Chromium
FS6-24.0-24.5X (Field Duplicate of FS6-24.0-24.5)	JB60544-4A	Soil	Metals
FS6-26.0-26.5	JB60544-5	Soil	Hexavalent Chromium
FS6-26.0-26.5	JB60544-5A	Soil	Metals
FS6-28.0-28.5	JB60544-6	Soil	Hexavalent Chromium
FS6-28.0-28.5	JB60544-6A	Soil	Metals
FS6-30.0-30.5	JB60544-8	Soil	Hexavalent Chromium
FS6-30.0-30.5	JB60544-8A	Soil	Metals
FS6-32.0-32.5	JB60544-9	Soil	Hexavalent Chromium
FS6-32.0-32.5	JB60544-9A	Soil	Metals
FS6-34.0-34.5	JB60544-10	Soil	Hexavalent Chromium
FS6-34.0-34.5	JB60544-10A	Soil	Metals
FS6-36.0-36.5	JB60544-11	Soil	Hexavalent Chromium
FS6-36.0-36.5	JB60544-11A	Soil	Metals
FS6-38.0-38.5	JB60544-12	Soil	Hexavalent Chromium
FS6-38.0-38.5	JB60544-12A	Soil	Metals
FS6-40.0-40.5	JB60544-13	Soil	Hexavalent Chromium
FS6-40.0-40.5	JB60544-13A	Soil	Metals
FS6GW-30.0-34.0	JB60544-7	Ground Water	Hexavalent Chromium
FS6GW-30.0-34.0	JB60544-7A	Ground Water	Metals
FS6GW-40.0-44.0	JB60544-14	Ground Water	Hexavalent Chromium
FS6GW-40.0-44.0	JB60544-14A	Ground Water	Metals
FS-FB20140225 (Equipment Blank)	JB60544-15	Aqueous	Hexavalent Chromium
FS-FB20140225 (Equipment Blank)	JB60544-15A	Aqueous	Metals

The samples were collected following the procedures detailed in the Remedial Investigation Work Plan - Soil for Non-Residential Chromate Chemical Production Waste Sites 114, 132, 133, 135, 137, 143, and 186, Jersey City, New Jersey, or applicable proposal or work plan, and the Field Sampling Plan/Quality Assurance Project Plan for Non-Residential and Residential Chromium Sites Hudson County, New Jersey (December 2011).

General Comments

The data package was complete. Quality control (QC) issues identified during validation are discussed below. Refer to the Target Analyte Summary Hit(s) in Attachment A for a listing of all detected results, qualified results, and associated qualifications, where applicable. The nonconformances for each section discussed below are presented in Attachment B.

Hexavalent Chromium

MS Results

Soil sample [FS6-22.0-22.5 (JB60544-2)] and groundwater sample [FS6GW-40.0-44.0 (JB60544-14)] were selected for matrix spike (MS) analysis associated with the samples in this SDG and were used for supporting data quality recommendations.

For the MS on soil sample FS6-22.0-22.5, the soluble and insoluble MS recoveries were 95.2% and 99.5%, respectively; which met the quality control (QC) criteria of 75-125%. The post digestion spike (PDS) recovery was 91.9%, which met the PDS criteria of 85-115%. No data qualification was required on the basis of spike recoveries.

For the MS on aqueous sample FS6GW-40.0-44.0, the MS recovery was 86.7%; which met the QC criteria of 85-115%. No data qualification was required on the basis of this spike recovery.

Sample Results

Reported results (flagged B by the laboratory) that were less than the reporting limit (RL), but greater than or equal to the method detection limit (MDL) are approximate values and have been qualified as estimated (J).

Metals

Laboratory Blanks/Equipment Blanks

Method Blank

Chromium and nickel were detected in the method blank (MP77967-MB1) associated with the soil samples in this SDG, at concentrations above the MDLs, but below the RLs. Since the results for chromium and nickel in the associated soil samples were greater than ten times the amount detected in the method blank, no qualifications were required.

MS Results

Sample FS6-22.0-22.5 (JB60544-2A) was the site sample used for the MS analysis associated with the Method 6010 analysis of the soil samples in this SDG. The laboratory provided batch QC for the aqueous samples. The batch QC was not assessed.

For the MS analysis on sample FS6-22.0-22.5, the recovery of antimony did not meet the QC criteria of 75-125%. The positive and nondetect results for antimony in all soil samples were qualified as estimated (J/UJ) with potential low bias.

Sample Results

Reported results (flagged B by the laboratory) that were less than the RL, but greater than or equal to the MDL are approximate values that have been qualified as estimated (J).

Data Quality and Usability

In general, these data appear to be valid and may be used for decision-making purposes. No data were rejected. Qualified results, if applicable, are presented in Attachments A and B.

Sample results for antimony qualified due to low MS recoveries are usable as estimated values with the potential for low bias.

Sample results reported between the MDL and RL are usable as estimated values with an unknown directional bias.

ATTACHMENTS

Attachment A: Target Analyte Summary Hitlist(s)

Attachment B: Data Validation Report Form

Attachment A

Target Analyte Summary Hitlist(s)

Soil Target Analyte Summary Hit List (Hexavalent Chromium)

Site Name PPG Garfield Avenue Supplemental Remedial Investigation (GARIS) Forrest Street
Sampling Date February 25, 2014
Lab Name/ID Accutest, Dayton, NJ
SDG No JB60544
Sample Matrix Soil
Trip Blank ID NA
Field Blank ID FS-FB20140225

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
FS6-20.0-20.5	JB60544-1	CHROMIUM (HEXAVALENT)	U	9.4	9.4	0.45		
FS6-22.0-22.5	JB60544-2	CHROMIUM (HEXAVALENT)	U	4.5	4.5	0.48		
FS6-24.0-24.5	JB60544-3	CHROMIUM (HEXAVALENT)	U	18.7	18.7	0.48		
FS6-24.0-24.5X	JB60544-4	CHROMIUM (HEXAVALENT)	U	17.1	17.1	0.48		
FS6-26.0-26.5	JB60544-5	CHROMIUM (HEXAVALENT)	U	17.4	17.4	0.48		
FS6-28.0-28.5	JB60544-6	CHROMIUM (HEXAVALENT)	U	17.8	17.8	0.50		
FS6-30.0-30.5	JB60544-8	CHROMIUM (HEXAVALENT)	U	0.37B	0.37J	0.50	Qualify	31
FS6-32.0-32.5	JB60544-9	CHROMIUM (HEXAVALENT)	U	0.094B	0.094J	0.48	Qualify	31
FS6-34.0-34.5	JB60544-10	CHROMIUM (HEXAVALENT)	U	0.37B	0.37J	0.48	Qualify	31
FS6-36.0-36.5	JB60544-11	CHROMIUM (HEXAVALENT)	U	0.63	0.63	0.50		
FS6-38.0-38.5	JB60544-12	CHROMIUM (HEXAVALENT)	U	0.27B	0.27J	0.50	Qualify	31
FS6-40.0-40.5	JB60544-13	CHROMIUM (HEXAVALENT)	U	0.26B	0.26J	0.51	Qualify	31

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

NJDEP Laboratory Footnote

1. The value reported is less than or equal to 3x the value in the preparation/reagent blank. It is the policy of NJDEP-DPFSR to negate the reported value due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
2. The value reported is greater than three (3) times but less than ten (10) times the value in the preparation/reagent blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to the preparation/reagent blank contamination. The "B" qualifier alerts the end-user to the presence of this analyte in the preparation/reagent blank.
3. The value reported is less than or equal to three (3) times the value in the trip/field blank. It is the policy of NJDEP-DPFSR to negate the reported value as due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
4. The value reported is greater than three (3) times but less than ten (10) times the value in the trip/field blanks and is considered "real". However, the reported value must be quantitatively qualified "J" due to trip/field blank contamination.
5. The concentration reported by the laboratory is incorrectly calculated.
6. The laboratory failed to report the presence of the analyte in the sample.
7. The reported Hexavalent Chromium value was qualified because the Calibration Check Standard was not within the recovery range (90-110 percent).
8. In the Duplicate Sample Analysis, Hexavalent Chromium fell outside the control limits of ≤ 20 percent for sample results $> 4xRL$ or $+ RL$ for sample results $< 4xRL$. Therefore, the result was qualified.
9. This analyte was rejected because the laboratory performed the Duplicate Analysis on a field blank.
10. The reported value was qualified because the PVS recovery was greater than 115 percent.
11. The reported value was qualified because the PVS recovery was less than 85 percent.
12. The non-detected value was qualified (UJ) because the PVS recovery was less than 85 percent. The possibility of a false negative exists.

13. The reported analyte was qualified because the associated Calibration Blank result was greater than the MDL.
14. The laboratory made a transcription error. No hits were found in the raw data.
15. This analyte is qualified or rejected because the laboratory exceeded the holding time for digestion and/or analysis.
16. The laboratory subtracted the preparation/reagent blank from the sample result. The Reviewer's calculation puts the preparation/reagent blank back into the result.
17. The photocopy is unreadable. Therefore, the QA reviewer cannot read the laboratory's reported concentration result.
18. The reported value was qualified because the predigestion spike recovery was less than 75 %, but greater than 50%.
19. The reported value was qualified because the predigestion spike recovery was greater than 125 percent.
20. The non-detected value was qualified (UJ) because the redigestion spike recovery was less than 75 percent. The possibility of a false negative exists.
21. The reported result was qualified or rejected because the laboratory did not record the pH value(s) of the sample in a laboratory notebook.
22. The reported value was qualified (J/UJ) because the sample moisture content exceeded 50 percent.
23. The sample result was rejected because the soluble and insoluble matrix spike recoveries were less than 50%.
24. The detected sample result was qualified (J) because the incorrect spike concentration was used.
25. The reported sample results were rejected because the predigestion spike recovery was greater than 150 percent.
26. The reported sample results were rejected because the redigestion spike recovery was greater than 150 percent.
27. The reported value was qualified (J) because the redigestion spike recovery was less than 75 percent.
28. The reported value was qualified (J/UJ) because the sample digestion temperature was less than 90C.

29. In the Field Duplicate Sample Analysis, Hexavalent Chromium fell outside the control limits of $\leq 20\%$ for sample results $> 4xRL$ or $+ RL$ for sample results $< 4xRL$. Therefore, the result was qualified.
30. The reported value was qualified as estimated (J/UJ) but the bias is uncertain due to both high and low MS recoveries.
31. The reported result was greater than the MDL but less than the RL and qualified (J) as estimated by the laboratory.
32. The reported value was qualified because the sample replicate precision criterion of $\leq 20\%$ for method 7199 was exceeded.
33. The reported value was qualified (J/UJ) because the laboratory control sample (LCS) recovery was less than 80%.
34. The reported value was qualified (J) because the laboratory control sample (LCS) recovery was greater than 120%.
35. The reported result was qualified because the matrix spike analysis was not performed at the proper frequency.
36. The reported result was qualified because the laboratory duplicate analysis was not performed at the proper frequency.
37. The result was qualified because the cooler temperature upon sample receipt exceeded 6C.
38. The reported value was qualified because the redigestion spike recovery was greater than 125 percent.
39. The reported result was rejected because the laboratory failed to perform the reanalysis due to insufficient sample volume.
40. The reported results was qualified because the laboratory failed to analyze an ending CCB.
41. The reported result was qualified because the laboratory failed to make the proper method specific pH adjustment.
42. The reported result was rejected because the laboratory failed to reanalyze the MS and associated sample(s) due to failed MS recoveries.

Aqueous Target Analyte Summary Hit List (Hexavalent Chromium)

Site Name PPG Garfield Avenue Supplemental Remedial Investigation (GARIS) Forrest Street
Sampling Date February 25, 2014
Lab Name/ID Accutest, Dayton, NJ
SDG No JB60544
Sample Matrix Groundwater
Trip Blank ID NA
Field Blank ID NA

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/L)	Laboratory Sample Result (mg/L)	Validation Sample Result (mg/L)	RL (mg/L)	Quality Assurance Decision	NJDEP Validation Footnote
FS6GW-30.0-34.0	JB60544-7	CHROMIUM (HEXAVALENT)	U	0.014	0.014	0.010		

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

NJDEP Laboratory Footnote

1. The value reported is less than or equal to 3x the value in the preparation/reagent blank. It is the policy of NJDEP-DPFSR to negate the reported value due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
2. The value reported is greater than three (3) times but less than ten (10) times the value in the preparation/reagent blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to the preparation/reagent blank contamination. The "B" qualifier alerts the end-user to the presence of this analyte in the preparation/reagent blank.
3. The value reported is less than or equal to three (3) times the value in the trip/field blank. It is the policy of NJDEP-DPFSR to negate the reported value as due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
4. The value reported is greater than three (3) times but less than ten (10) times the value in the trip/field blanks and is considered "real". However, the reported value must be quantitatively qualified "J" due to trip/field blank contamination.
5. The concentration reported by the laboratory is incorrectly calculated.

6. The laboratory failed to report the presence of the analyte in the sample.
7. The reported Hexavalent Chromium value was qualified because the Calibration Check Standard was not within the recovery range (90-110 percent).
8. In the Duplicate Sample Analysis, Hexavalent Chromium fell outside the control limits of ≤ 20 percent for sample results $> 4xRL$ or $+ RL$ for sample results $< 4xRL$. Therefore, the result was qualified.
9. This analyte was rejected because the laboratory performed the Duplicate Analysis on a field blank.
10. The reported value was qualified because the PVS recovery was greater than 115 percent.
11. The reported value was qualified because the PVS recovery was less than 85 percent.
12. The non-detected value was qualified (UJ) because the PVS recovery was less than 85 percent. The possibility of a false negative exists.
13. The reported analyte was qualified because the associated Calibration Blank result was greater than the MDL.
14. The laboratory made a transcription error. No hits were found in the raw data.
15. This analyte is qualified or rejected because the laboratory exceeded the holding time for digestion and/or analysis.
16. The laboratory subtracted the preparation/reagent blank from the sample result. The Reviewer's calculation puts the preparation/reagent blank back into the result.
17. The photocopy is unreadable. Therefore, the QA reviewer cannot read the laboratory's reported concentration result.
18. The reported value was qualified because the predigestion spike recovery was less than 75 %, but greater than 50%.
19. The reported value was qualified because the predigestion spike recovery was greater than 125 percent.
20. The non-detected value was qualified (UJ) because the redigestion spike recovery was less than 75 percent. The possibility of a false negative exists.
21. The reported result was qualified or rejected because the laboratory did not record the pH value(s) of the sample in a laboratory notebook.

22. The reported value was qualified (J/UJ) because the sample moisture content exceeded 50 percent.
23. The sample result was rejected because the soluble and insoluble matrix spike recoveries were less than 50%.
24. The detected sample result was qualified (J) because the incorrect spike concentration was used.
25. The reported sample results were rejected because the predigestion spike recovery was greater than 150 percent.
26. The reported sample results were rejected because the redigestion spike recovery was greater than 150 percent.
27. The reported value was qualified (J) because the redigestion spike recovery was less than 75 percent.
28. The reported value was qualified (J/UJ) because the sample digestion temperature was less than 90C.
29. In the Field Duplicate Sample Analysis, Hexavalent Chromium fell outside the control limits of $\leq 20\%$ for sample results $> 4xRL$ or $+ RL$ for sample results $< 4xRL$. Therefore, the result was qualified.
30. The reported value was qualified as estimated (J/UJ) but the bias is uncertain due to both high and low MS recoveries.
31. The reported result was greater than the MDL but less than the RL and qualified (J) as estimated by the laboratory.
32. The reported value was qualified because the sample replicate precision criterion of $\leq 20\%$ for method 7199 was exceeded.
33. The reported value was qualified (J/UJ) because the laboratory control sample (LCS) recovery was less than 80%.
34. The reported value was qualified (J) because the laboratory control sample (LCS) recovery was greater than 120%.
35. The reported result was qualified because the matrix spike analysis was not performed at the proper frequency.
36. The reported result was qualified because the laboratory duplicate analysis was not performed at the proper frequency.
37. The result was qualified because the cooler temperature upon sample receipt exceeded 6C.
38. The reported value was qualified because the redigestion spike recovery was greater than 125 percent.

39. The reported result was rejected because the laboratory failed to perform the reanalysis due to insufficient sample volume.
40. The reported results was qualified because the laboratory failed to analyze an ending CCB.
41. The reported result was qualified because the laboratory failed to make the proper method specific pH adjustment.
42. The reported result was rejected because the laboratory failed to reanalyze the MS and associated sample(s) due to failed MS recoveries.

Soil Target Analyte Summary Hit List (Metals)

Site Name PPG Garfield Avenue Supplemental Remedial Investigation (GARIS) Forrest Street
Sampling Date February 25, 2014
Lab Name/ID Accutest, Dayton, NJ
SDG No JB60544A
Sample Matrix Soil
Trip Blank ID NA
Field Blank ID FS-FB20140225

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
FS6-20.0-20.5	JB60544-1A	ANTIMONY	U	3.2	3.2	2.3	Qualify	15
FS6-20.0-20.5	JB60544-1A	CHROMIUM	0.15	43.2	43.2	1.1		
FS6-20.0-20.5	JB60544-1A	NICKEL	0.45	12.6	12.6	4.6		
FS6-20.0-20.5	JB60544-1A	VANADIUM	U	27.2	27.2	5.7		
FS6-22.0-22.5	JB60544-2A	ANTIMONY	U	0.43B	0.43	2.3	Qualify	15,23
FS6-22.0-22.5	JB60544-2A	CHROMIUM	0.15	66.8	66.8	1.2		
FS6-22.0-22.5	JB60544-2A	NICKEL	0.45	11.5	11.5	4.6		
FS6-22.0-22.5	JB60544-2A	VANADIUM	U	21.9	21.9	5.8		
FS6-24.0-24.5	JB60544-3A	ANTIMONY	U	U	U	2.4	Qualify	15
FS6-24.0-24.5	JB60544-3A	CHROMIUM	0.15	45.9	45.9	1.2		
FS6-24.0-24.5	JB60544-3A	NICKEL	0.45	13.4	13.4	4.8		
FS6-24.0-24.5	JB60544-3A	VANADIUM	U	24.9	24.9	6.0		
FS6-24.0-24.5X	JB60544-4A	ANTIMONY	U	U	U	2.4	Qualify	15
FS6-24.0-24.5X	JB60544-4A	CHROMIUM	0.15	34.2	34.2	1.2		
FS6-24.0-24.5X	JB60544-4A	NICKEL	0.45	6.6	6.6	4.8		
FS6-24.0-24.5X	JB60544-4A	VANADIUM	U	14.9	14.9	6.0		
FS6-26.0-26.5	JB60544-5A	ANTIMONY	U	U	U	2.3	Qualify	15
FS6-26.0-26.5	JB60544-5A	CHROMIUM	0.15	30.6	30.6	1.2		

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
FS6-26.0-26.5	JB60544-5A	NICKEL	0.45	5.8	5.8	4.6		
FS6-26.0-26.5	JB60544-5A	VANADIUM	U	13.3	13.3	5.8		
FS6-28.0-28.5	JB60544-6A	ANTIMONY	U	U	U	2.5	Qualify	15
FS6-28.0-28.5	JB60544-6A	CHROMIUM	0.15	36.4	36.4	1.2		
FS6-28.0-28.5	JB60544-6A	NICKEL	0.45	14.7	14.7	5.0		
FS6-28.0-28.5	JB60544-6A	VANADIUM	U	21.5	21.5	6.2		
FS6-30.0-30.5	JB60544-8A	ANTIMONY	U	U	U	2.6	Qualify	15
FS6-30.0-30.5	JB60544-8A	CHROMIUM	0.15	14.1	14.1	1.3		
FS6-30.0-30.5	JB60544-8A	NICKEL	0.45	5.6	5.6	5.1		
FS6-30.0-30.5	JB60544-8A	VANADIUM	U	13.1	13.1	6.4		
FS6-32.0-32.5	JB60544-9A	ANTIMONY	U	U	U	2.4	Qualify	15
FS6-32.0-32.5	JB60544-9A	CHROMIUM	0.15	9.8	9.8	1.2		
FS6-32.0-32.5	JB60544-9A	NICKEL	0.45	6.9	6.9	4.8		
FS6-32.0-32.5	JB60544-9A	VANADIUM	U	14.1	14.1	5.9		
FS6-34.0-34.5	JB60544-10A	ANTIMONY	U	U	U	2.4	Qualify	15
FS6-34.0-34.5	JB60544-10A	CHROMIUM	0.15	19.3	19.3	1.2		
FS6-34.0-34.5	JB60544-10A	NICKEL	0.45	7.6	7.6	4.9		
FS6-34.0-34.5	JB60544-10A	VANADIUM	U	11.5	11.5	6.1		
FS6-36.0-36.5	JB60544-11A	ANTIMONY	U	U	U	2.4	Qualify	15
FS6-36.0-36.5	JB60544-11A	CHROMIUM	0.15	9.9	9.9	1.2		
FS6-36.0-36.5	JB60544-11A	NICKEL	0.45	4.0B	4.0	4.8	Qualify	23
FS6-36.0-36.5	JB60544-11A	VANADIUM	U	10.4	10.4	6.0		
FS6-38.0-38.5	JB60544-12A	ANTIMONY	U	U	U	2.5	Qualify	15
FS6-38.0-38.5	JB60544-12A	CHROMIUM	0.15	8.8	8.8	1.2		
FS6-38.0-38.5	JB60544-12A	NICKEL	0.45	6.5	6.5	4.9		

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
FS6-38.0-38.5	JB60544-12A	VANADIUM	U	13.6	13.6	6.1		
FS6-40.0-40.5	JB60544-13A	ANTIMONY	U	U	U	2.6	Qualify	15
FS6-40.0-40.5	JB60544-13A	CHROMIUM	0.15	7.6	7.6	1.3		
FS6-40.0-40.5	JB60544-13A	NICKEL	0.45	5.3	5.3	5.2		
FS6-40.0-40.5	JB60544-13A	VANADIUM	U	12.5	12.5	6.5		

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

NJDEP Laboratory Footnote

1. The value reported is less than or equal to 3x the value in the method blank. It is the policy of NJDEP-DPFSR to negate the reported value due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
2. The value reported is greater than three (3) but less than ten (10) times the value in the method blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to the method blank contamination. The "B" qualifier alerts the end-user to the presence of this analyte in the method blank.
3. The value reported is less than or equal to 3x the value in the trip/field blank. It is the policy of NJDEP-DPFSR to negate the reported value as due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
4. The value reported is greater than 3x but less than ten (10) the value in the trip/field blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to trip/field blank contamination.
5. The concentration reported by the laboratory is incorrectly calculated.
6. The laboratory failed to report the presence of the analyte in the sample.
7. The reported metal value was qualified because the Calibration Verification Standard was not within the recovery range (90-110 percent).
8. In the MS/MSD Sample Analysis, this analyte fell outside the control limits of 20% RPD. Therefore, the result was qualified.

9. This analyte was qualified because the laboratory performed the MS/MSD Analysis on a field blank.
10. The reported analyte was qualified because the associated Calibration Blank result was greater than the MDL.
11. The reported value was qualified because serial dilution analysis was not within QC limit of 10% D.
12. This analyte is rejected because the laboratory exceeded the holding time for digestion and analysis.
13. The laboratory subtracted the method blank from the sample result. The reviewer's calculation has added the method blank result to the reported concentration.
14. The photocopy submitted is illegible. Therefore, the QA reviewer cannot read the laboratory's reported concentration result.
15. The reported or nondetected value was qualified because the MS/MSD spike recovery was less than 75 percent.
16. The reported value was qualified because the MS/MSD spike recovery was greater than 125 percent.
17. The reported value was qualified as estimated (J/UJ) but the bias is uncertain due to both high and low MS recoveries.
18. The reported values were qualified because the laboratory duplicate exceeded 35 percent RPD for results greater than 5X the reporting limit or the absolute difference exceeded two times the reporting limit for sample result less than 5 times the reporting limit.
19. The reported value was qualified because the field duplicate exceeded 35 percent RPD for results greater than 5X the reporting limit or the absolute difference exceeded two times the reporting limit for sample result less than 5 times the reporting limit.
20. The reported value was qualified because the LCS recovery was less than 80 percent.
21. The reported value was qualified because the sample moisture content was greater than 50 percent.
22. The reported value was rejected because the field duplicate absolute difference was greater than 4 times the RL or the RPD was greater than 120%.
23. The reported result was greater than the MDL but less than the RL and qualified (J) as estimated by the laboratory.
24. The field duplicate absolute difference exceeded two times the reporting limit for sample result less than 5 times the reporting limit.

25. The reported value was qualified because the LCS recovery was greater than 120 percent.

Aqueous Target Analyte Summary Hit List (Metals)

Site Name PPG Garfield Avenue Supplemental Remedial Investigation (GARIS) Forrest Street
Sampling Date February 25, 2014
Lab Name/ID Accutest, Dayton, NJ
SDG No JB60544A
Sample Matrix Groundwater
Trip Blank ID NA
Field Blank ID NA

Field Sample ID	Lab Sample ID	Analyte	Method Blank (ug/L)	Laboratory Sample Result (ug/L)	Validation Sample Result (ug/L)	RL (ug/L)	Quality Assurance Decision	NJDEP Validation Footnote
FS6GW-30.0-34.0	JB60544-7A	CHROMIUM	U	3940	3940	100		
FS6GW-40.0-44.0	JB60544-14A	CHROMIUM	U	4980	4980	100		

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

NJDEP Laboratory Footnote

1. The value reported is less than or equal to 3x the value in the method blank. It is the policy of NJDEP-DPFSR to negate the reported value due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
2. The value reported is greater than three (3) but less than ten (10) times the value in the method blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to the method blank contamination. The "B" qualifier alerts the end-user to the presence of this analyte in the method blank.
3. The value reported is less than or equal to 3x the value in the trip/field blank. It is the policy of NJDEP-DPFSR to negate the reported value as due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
4. The value reported is greater than 3x but less than ten (10) the value in the trip/field blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to trip/field blank contamination.
5. The concentration reported by the laboratory is incorrectly calculated.

6. The laboratory failed to report the presence of the analyte in the sample.
7. The reported metal value was qualified because the Calibration Verification Standard was not within the recovery range (90-110 percent).
8. In the MS/MSD Sample Analysis, this analyte fell outside the control limits of 20% RPD. Therefore, the result was qualified.
9. This analyte was qualified because the laboratory performed the MS/MSD Analysis on a field blank.
10. The reported analyte was qualified because the associated Calibration Blank result was greater than the MDL.
11. The reported value was qualified because serial dilution analysis was not within QC limit of 10% D.
12. This analyte is rejected because the laboratory exceeded the holding time for digestion and analysis.
13. The laboratory subtracted the method blank from the sample result. The reviewer's calculation has added the method blank result to the reported concentration.
14. The photocopy submitted is illegible. Therefore, the QA reviewer cannot read the laboratory's reported concentration result.
15. The reported or nondetected value was qualified because the MS/MSD spike recovery was less than 75 percent.
16. The reported value was qualified because the MS/MSD spike recovery was greater than 125 percent.
17. The reported value was qualified as estimated (J/UJ) but the bias is uncertain due to both high and low MS recoveries.
18. The reported values were qualified because the laboratory duplicate exceeded 35 percent RPD for results greater than 5X the reporting limit or the absolute difference exceeded two times the reporting limit for sample result less than 5 times the reporting limit.
19. The reported value was qualified because the field duplicate exceeded 35 percent RPD for results greater than 5X the reporting limit or the absolute difference exceeded two times the reporting limit for sample result less than 5 times the reporting limit.
20. The reported value was qualified because the LCS recovery was less than 80 percent.
21. The reported value was qualified because the sample moisture content was greater than 50 percent.

22. The reported value was rejected because the field duplicate absolute difference was greater than 4 times the RL or the RPD was greater than 120%.
23. The reported result was greater than the MDL but less than the RL and qualified (J) as estimated by the laboratory.
24. The field duplicate absolute difference exceeded two times the reporting limit for sample result less than 5 times the reporting limit.
25. The reported value was qualified because the LCS recovery was greater than 120 percent.

Attachment B

Data Validation Report Form

Client Name: PPG Industries	Project Number: 60154801.6001A
Site Location: PPG Garfield Avenue Supplemental Remedial Investigation (GARIS) Forrest Street Groundwater and Soil, Jersey City, NJ	Project Manager: William Spronz
Laboratory: Accutest, Dayton, NJ	Type of Validation: Full
Laboratory Job No: JB60544	Date Checked: 4/17/14
Validator: Paula DiMattei	Peer: Lisa Krowitz

ITEM	YES	NO	N/A	COMMENTS
Sample results included?	X			
Reporting Limits met project requirements?	X			
Field I.D. included?	X			
Laboratory I.D. included?	X			
Sample matrix included?	X			
Sample receipt temperature 2-6C?		X		One cooler was received at 1°C. No actions required.
Signed COCs included?	X			
Date of sample collection included?	X			
Date of sample digestion included?	X			
Holding time to digestion met criteria? (Soils -30 days from collection to digestion.)	X			
Date of analysis included?	X			
Holding time to analysis met criteria? (Soils -168 hours from digestion to analysis; Aqueous - 24 hours from collection to analysis.)	X			
Method reference included?	X			
Laboratory Case Narrative included?	X			

Definitions: MDL Method Detection Limit; %R Percent Recovery; RL Reporting Limit; RPD Relative Percent Difference; RSD Relative Standard Deviation :Corr Correlation Coefficient.

ITEM	YES	NO	N/A	COMMENTS
Initial calibration documentation included in lab package?	X			
1) Blank plus 4 standards (7196A) or blank plus 3 standards (7199)	X			
2) Correlation coefficient of =0.995 (7196A) or =0.999 (7199)	X			
3) Calibrate daily or each time instrument is set up.	X			
Calibration Check Standard (CCS) for 7196A and Quality Control Sample (QCS) for 7199 Included in Lab Package?	X			
1) %R criteria met? (90 - 110%)	X			
2) Correct frequency of one per every 10 samples	X			
3) CCS and QCS from independent source and at mid-level of calibration curve	X			
Calibration Blanks	X			
1) Analyzed prior to initial calibration standards and after each CCS/QCS?	X			
2) Absolute value should not exceed MDL.	X			
Method Blank, Field Blanks and/or Equipment Blanks Included in Lab Package?	X			FS-FB20140225
1) Method blank analyzed with each preparation batch?	X			
2) Absolute value should not exceed MDL.	X			
Eh and pH Data	X			
1) Eh and pH data was included and plotted for all samples?	X			
Soluble Matrix Spike Data Included in Lab Package?	X			
1) Soluble Matrix %R criteria met? (75-125%R).	X			
2) Was the spike concentration 40 mg/Kg or twice the sample concentration?	X			
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	X			
Insoluble Matrix Spike Data Included in Lab Package?	X			
1) Insoluble Matrix %R criteria met? (75-125%R).	X			
2) Was the spike concentration around 400 to 800 mg/Kg?		X		Spiked at 1440 mg/kg. No impact to data.
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	X			

ITEM	YES	NO	N/A	COMMENTS
Post Digestion Spike	X			
1) Post Digestion Spike %R criteria met? (85-115%R).	X			
2) Was the spike concentration 40 mg/Kg or twice the sample concentration?	X			
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	X			
Sample Duplicate Data Included in Lab Package?	X			Aqueous: FSGW-40.0-44.0; Soil: FS6-22.0-22.5
1) RPD criteria met? (RPD ≤20%) if both results are ≤4x RL or absolute difference ≤RL if either or both results are <4xRL.	X			
2) Was a sample duplicate analyzed at the frequency of 1 per batch or 20 samples?	X			
Was a Laboratory Control Sample (LCS) Included in Lab Package?	X			
1) %R criteria met? (80-120%R).	X			
2) Was an LCS analyzed at the frequency of 1/batch or 20 samples?	X			
Were any Field Duplicate samples submitted with this SDG?	X			FS6-24.0-24.5 and FS6-24.0-24.5X
1) Were Field duplicate RPD criteria met? (RPD≤20% for both sample results >4xRL or absolute difference ≤ RL if either or both results are <4xRL.	X			
Were all sample quantitation and reporting requirements met?	X			
1) Were all solid samples reported with percent solids > 50% ?	X			
2) Were any samples analyzed or reported with dilutions?		X		
Miscellaneous Items	X			
1) For soils by 7196A, was the pH within a range of 7.0-8.0?	X			
2) For soils by 7199, was the pH within a range of 9.0-9.5?			X	
3) For aqueous by 7196A, was the pH with a range of 1.5-2.5?	X			
4) For soils (3060A), was the digestion temperature 90-95C for at least 60 minutes?	X			
5) For 7199, was each sample injected twice and was the RPD =20?			X	

SDG#: JB60544
Batch: GN332
 Cr+6 ICAL 02/28/14
 Soil
 (p. 60 of data pkg)

x - concentration	y - response
0	0
0.01	0.009
0.05	0.044
0.1	0.091
0.3	0.269
0.5	0.444
0.8	0.691
1	0.887

(p. 60 of data pkg)

AECOM Calculated Intercept	0.0014	OK	Reported intercept	0.0014
AECOM Slope	0.8783	OK	Reported Slope	0.8783
AECOM Calculated r	0.99984	OK	Reported r	0.99984

GP78193-B1
p.60

LCS calculation

Background Absorbance	0
Total absorbance	0.811
Total absorbance - background	0.811
Instrument Concentration	0.922
Sample weight (mg/kg)	0.0025
Final Volume (L)	0.1
Dilution Factor	1

AECOM Calculated LCS Result (mg/Kg)	36.9	OK	Reported Result (mg/Kg)	36.9
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%R = Found/True*100

p. 39

True Value (mg/kg)	40
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AECOM Calculated %R	92.2	OK rounding	Reported %R	92.3
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MS calculation

JB60544-2 [FS6-22.0-22.5] pg. 60

Background reading	0
Total absorbance	0.545
Total absorbance - background	0.545
Instrument Concentration	0.6190
Sample weight (mg/kg)	0.00256
Final Volume (L)	0.1
Percent solids	0.841
Dilution Factor	50

AECOM Calculated MS Result (mg/Kg)	1440	OK	Reported Result (mg/Kg)	1440
------------------------------------	------	----	-------------------------	------

%R = Found/True*100

JB60544-2 [FS6-22.0-22.5] pg. 41

True Value (mg/kg)	1440
Native concentration (mg/Kg)	4.5

AECOM%R	99.5	OK	Reported %R	99.5
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Percent Solids

JB60544-2 [FS6-22.0-22.5] pg. 42

Empty dish weight=	29.48
Wet weight=	34.50
Dry weight=	33.7

AECOM%solids =	84.1	OK	reported %solids=	84.1
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Reporting Limit**JB60544-2 [FS6-22.0-22.5] pg. 10**

Low Standard	0.01		
Initial weight (mg/kg)	0.00253		
Final volume (L)	0.1		
Percent solids	0.841		
Dilution Factor	1		
Reporting Limit	0.47	OK rounding	Reported RL (mg/Kg)= 0.48

Sample Calculations**JB60544-2 [FS6-22.0-22.5] pg. 11, 60**

Background reading	0.004		
Total absorbance	0.089		
Total absorbance - background	0.085		
Instrument Response	0.095		
Sample weight (mg/kg)	0.00253		
Final Volume (L)	0.1		
Percent solids	0.841		
Dilution Factor	1		
AECOM Calculated Result (mg/Kg)	4.5	OK	Reported Result (mg/Kg) 4.5

JB60544-1 [FS6-20.0-20.5] pg. 10, 60

Background reading	0.005		
Total absorbance	0.196		
Total absorbance - background	0.191		
Instrument Response	0.216		
Sample weight (mg/kg)	0.00259		
Final Volume (L)	0.1		
Percent solids	0.888		
Dilution Factor	1		
AECOM Calculated Result (mg/Kg)	9.4	OK	Reported Result (mg/Kg) 9.4

Client Name: PPG Industries	Project Number: 60154801.6001A
Site Location: PPG Garfield Avenue Supplemental Remedial Investigation (GARIS) Forrest Street Groundwater and Soil, Jersey City, NJ	Project Manager: William Spronz
Laboratory: Accutest, Dayton, NJ	Type of Validation: Limited
Laboratory Job No: JB60544A	Date Checked: 4/17/14
Validator: Paula DiMattei	Peer: Lisa Krowitz

ITEM	YES	NO	N/A	COMMENTS
Sample results included?	X			
Reporting Limits met project requirements?	X			
Field I.D. included?	X			
Laboratory I.D. included?	X			
Sample matrix included?	X			
Sample receipt temperature 2-6C?		X		One cooler was received at 1°C. No actions required.
Signed COCs included?	X			
Date of sample collection included?	X			
Date of sample digestion included?	X			
Date of analysis included?	X			
Holding time met QC criteria? (Metals -180 days from sample collection; Mercury - 28 days from sample collection. If HT exceeded by 10 days R all results.	X			
Method reference included?	X			
Laboratory Case Narrative included?	X			

Definitions: MDL Method Detection Limit; %R Percent Recovery; RL Reporting Limit; RPD Relative Percent Difference; RSD Relative Standard Deviation ;Corr Correlation Coefficient.

ITEM	YES	NO	N/A	COMMENTS
Sample dilutions?		X		
Initial calibration documentation included in lab package?			X	NA for a Limited Review.
1) Calibrate daily or each time instrument is set up.			X	
2) ICP (6010) -Blank plus 1 standard? If no, reject (R) data.			X	
3) Hg (7470/7471) -Blank plus 5 standards? If no, reject (R) data.			X	
Initial Calibration Verification Standard (ICV) for ICP (6010) and Initial Calibration Check Standard (ICCS) for Hg (7470/7471) included in lab package?			X	
1) Analyzed immediately after initial calibration? If no, reject (R) data.			X	
2) %R criteria met? (90-110%). If no, J positive results for affected analyte(s) if %R between 80-89% and 111-120% and indicate bias; UJ non-detect results for affected analyte(s) if %R between 80-89% , and R all data for affected analyte(s) if %R 120%.			X	
3) Spot check ICV/ICCS results for several analytes.			X	
Continuing Calibration Verification Standard (CCV) for ICP (6010) and Calibration Check Standard (CCS) for Hg (7470/7471) included in Lab Package?			X	
1) Analyzed immediately after each ICV/ICC/CB and after every 10 samples? If no, reject (R) data.			X	
2) CCS and CCV from independent source and at mid-level of calibration curve. If no, reject (R) data.			X	
3) %R criteria met? (90-110%R). If no, J positive results for affected analyte(s) if %R between 80-89% and 111-120% and indicate bias; UJ non-detect results for affected analyte(s) if %R between 80-89% and R all data for affected analyte(s) if %R 120%.			X	
4) Spot check CCV/CCS results for several analytes.			X	
Low Calibration Standard (CRI) included in Lab Package?			X	
1) %R criteria met? - 50-150% for Co, Mn, Zn, by ICP-MS; Pb, Tl by 6010; 70-130% all others. If no, refer to ILM05.4 NJ SOP 5.A.2 for actions.			X	

ITEM	YES	NO	N/A	COMMENTS
Calibration Blanks			X	NA for a Limited Review
1) Analyzed after daily calibration and after each ICV/ICC/CCV/CCS and after every 10 samples? If no, reject (R) data.			X	
2) Absolute value 10xCB result, no qualification.			X	
Method Blank Included in Lab Package?	X			
1) Method blank analyzed with each preparation batch or every SDG, or 1/20 samples? If no, reject (R) data, except no aqueous MB required for FB/EB if only soil samples were analyzed.	X			
2) Method blank analyzed 1/20 samples? If - MB 1/25, J sample results from 21-25; -MB >1/25, R sample results after 25th sample.	X			
3) MB results nondetect? If no, -sample result 3xMB but 10xMB, no qualification.		X		See nonconformance table below.
4) Negative MB result reported? If yes, -Positive sample result		X		
Field Blanks/Equipment Blanks Included in Lab Package?	X			FS-FB2014022
1) FB/EB result non-detect? If no, -sample result 3xFB/EB but 10xFB/EB, no qualification.	X			
ICP Interference Check Sample (ICS) included in Lab Package?			X	NA for a Limited Review.
1) Analyzed at beginning of analytical run? If no, reject (R) data.			X	
2) %R criteria met? (80-120%) If no, %R>120%, no qualification if sample result non-detect; %R between 121-150%, J positive results, biased high; %R between 50-79%, J/UJ results, biased low; %R150%, reject (R) result			X	
3) Spot check accuracy of %Rs			X	
Matrix Spike/Matrix Spike Duplicate Data Included in Lab Package?	X			
1) MS/MSD %R (75-125%R) and RPD (+20%) criteria met? - %R>125% J positive results for affected analyte(s) for all samples in the same batch/SDG, accept NDs; -%R		X		See nonconformance table below.
2) Was a sample spiked at the frequency of 1/batch or 20 samples?	X			
3) Was the MS performed on a site sample?	X			Soil: FS6-22.0-22.5 and Aqueous: batch QC. Batch QC was not assessed.
4) Was the MS performed on a FB/EB or TB? If yes, J all sample data.		X		

ITEM	YES	NO	N/A	COMMENTS
Post Digestion Spike			X	NA for a Limited Review.
1) %R criteria met? (75-125%R) - %R>125% J positive results for affected analyte(s) for all samples in the same batch/SDG, accept NDs.; - %R			X	
2) Was the spike performed on a FB/EB or TB? If yes, J all sample data.			X	
3) Was a sample spiked at the frequency of 1/batch or 20 samples?			X	
Laboratory Duplicate Data Included in Lab Package?		X		MS/MSD analysis performed in lieu of laboratory duplicate analysis.
Aqueous - If RPD is >20% but 5x the QL, estimate (J) results >the QL. - If RPD is >100%, reject R results >= the QL.- If sample and/or duplicate is the QL, estimate (J) positive results 2x the QL, reject R non-detects and positive results			X	
Soil - If RPD is >35% but 5x the QL, estimate (J) results > the QL. - If RPD is >120%, reject results > the QL. - If sample and/or duplicate is 2x the QL, estimate (J) positive results 4x the QL, reject nondetects and positive results			X	
Was a Laboratory Control Sample (LCS) Included in Lab Package?	X			
1) LCS %R criteria met? (80-120%R). If no, J/UJ all affected analytes(s) for all samples in the same batch/SDG.	X			
2) Was an LCS analyzed at the frequency of 1/batch or 20 samples? If no, J/UJ affected analyte(s) for all samples in the same batch/SDG.	X			
Serial Dilution			X	NA for a Limited Review.
1) %D(25xIDL (7000) or >10xIDL (6010) and %D >10% J positive results for affected analyte(s) for all samples in the same batch/SDG, accept NDs.			X	
2) Was the frequency 1/batch or 20 samples?			X	
3) Was a site sample used?			X	
4) Was a FB/EB or TB used? If yes, J all sample data.			X	
5) Spot check accuracy of %Ds.			X	

ITEM	YES	NO	N/A	COMMENTS
Field Duplicate Data included in Lab Package?	X			FS6-24.0-24.5 and FS6-24.0-24.5X
Aqueous - If RPD is >20% but 5x the QL, estimate (J) results > the QL. - If RPD is >100%, reject R results >= the QL. - If sample and/or duplicate is the QL, estimate (J) positive results 2x the QL, reject R non-detects and positive results			X	
Soil - If RPD is >35% but 5x the QL, estimate (J) results > the QL. - If RPD is >120%, reject results > the QL. - If sample and/or duplicate is 2x the QL, estimate (J) positive results 4x the QL, reject nondetects and positive results		X		All criteria met.
Percent Solids data included in Lab Package?	X			
1) %Solids criteria (Reg 2 criteria) met? (>=50%)	X			

Laboratory Blanks

Blank ID	Analyte	Result	QL	Units	Associated Samples
MP77967-MB1	Chromium	0.15	0.99	mg/kg	All soil samples in this SDG
MP77967-MB1	Nickel	0.45	4.0	mg/kg	

Matrix Spikes

Sample ID	Analyte	Batch	MS % Recovery	MSD % Recovery	Lower Limit	Upper Limit	RPD	RPD Limit
FS6-22.0-22.5	Antimony	MP77967	41.9	48.1	75	125	ok	20

Data Validation Report

Project:	PPG Garfield Avenue Supplemental Remedial Investigation (GARIS) Forrest Street Groundwater and Soils	
Laboratory:	Accutest, Dayton, NJ	
Laboratory Job No.:	JB60888 and JB60888A	
Analysis/Method:	Hexavalent Chromium SW846 3060A/7196 Metals by ICP-AES/ SW846-6010	
Validation Level:	Full (Hexavalent Chromium) Limited (Metals)	
Site Location/Address:	Forrest Street, Jersey City, NJ	
AECOM Project No:	60154801.6001A	
Prepared by:	Paula DiMattei /AECOM	Completed on: 04/28/2014
Reviewed by:	Lisa Krowitz /AECOM	File Name: JB60888_A_2014-04-28_DV Report-F

Introduction

The data were reviewed in accordance with the FSP-QAPP and the following NJDEP validation Standard Operating Procedures (SOP):

- NJDEP Office of Data Quality SOP 5.A.10, Rev 3 (September 2009), SOP for Analytical Data Validation of Hexavalent Chromium - for USEPA SW-846 Method 3060A, USEPA SW-846 Method 7196A and USEPA SW-846 Method 7199;
- NJDEP Office of Data Quality SOP 5.A.16, Rev 1 (May 2002), Quality Assurance Data Validation of Analytical Deliverables for Inorganics (based on USEPA SW-846 Methods)

The results of quality control data analyzed with site samples were used to assess the overall reliability of the data. The following qualifiers were used to identify data quality issues:

- U: Indicates the analyte was not detected in the sample above the sample reporting limit.
- J: Indicates the result was an estimated value; the associated numerical value was an approximate concentration of the analyte in the sample.
- UJ: Indicates the analyte was not detected above the reporting limit and the reporting limit was approximate.
- R: The sample result was rejected due to serious deficiencies; the presence or absence of the analyte could not be confirmed.
- RA: The sample result was rejected but is still considered usable.

Sample Information

The samples listed below were collected by AECOM on February 28, 2014 as part of the PPG Garfield Avenue Supplemental Remedial Investigation (GARIS) Forrest Street Groundwater and Soil sampling at the PPG Forrest Street, Jersey City, NJ. Only the samples and parameters listed below were validated.

Field ID	Laboratory ID	Matrix	Fraction
FS8-0.0-0.5	JB60888-1	Soil	Hexavalent Chromium
FS8-0.0-0.5	JB60888-1A	Soil	Metals
FS8-10.0-10.5	JB60888-8	Soil	Hexavalent Chromium
FS8-10.0-10.5	JB60888-8A	Soil	Metals
FS8-12.0-12.5	JB60888-9	Soil	Hexavalent Chromium
FS8-12.0-12.5	JB60888-9A	Soil	Metals
FS8-14.0-14.5	JB60888-10	Soil	Hexavalent Chromium
FS8-14.0-14.5	JB60888-10A	Soil	Metals
FS8-16.0-16.5	JB60888-11	Soil	Hexavalent Chromium
FS8-16.0-16.5	JB60888-11A	Soil	Metals
FS8-2.0-2.5	JB60888-2	Soil	Hexavalent Chromium
FS8-2.0-2.5	JB60888-2A	Soil	Metals
FS8-2.0-2.5X (Field Duplicate of FS8-2.0-2.5)	JB60888-3	Soil	Hexavalent Chromium
FS8-2.0-2.5X (Field Duplicate of FS8-2.0-2.5)	JB60888-3A	Soil	Metals
FS8-20.0-20.5	JB60888-13	Soil	Hexavalent Chromium
FS8-20.0-20.5	JB60888-13A	Soil	Metals
FS8-22.0-22.5	JB60888-14	Soil	Hexavalent Chromium
FS8-22.0-22.5	JB60888-14A	Soil	Metals
FS8-24.0-24.5	JB60888-15	Soil	Hexavalent Chromium
FS8-24.0-24.5	JB60888-15A	Soil	Metals
FS8-26.0-26.5	JB60888-16	Soil	Hexavalent Chromium
FS8-26.0-26.5	JB60888-16A	Soil	Metals
FS8-28.0-28.5	JB60888-17	Soil	Hexavalent Chromium
FS8-28.0-28.5	JB60888-17A	Soil	Metals
FS8-30.0-30.5	JB60888-19	Soil	Hexavalent Chromium
FS8-30.0-30.5	JB60888-19A	Soil	Metals
FS8-32.0-32.5	JB60888-20	Soil	Hexavalent Chromium
FS8-32.0-32.5	JB60888-20A	Soil	Metals
FS8-34.0-34.5	JB60888-21	Soil	Hexavalent Chromium
FS8-34.0-34.5	JB60888-21A	Soil	Metals
FS8-36.0-36.5	JB60888-22	Soil	Hexavalent Chromium
FS8-36.0-36.5	JB60888-22A	Soil	Metals
FS8-38.0-38.5	JB60888-23	Soil	Hexavalent Chromium

Field ID	Laboratory ID	Matrix	Fraction
FS8-38.0-38.5	JB60888-23A	Soil	Metals
FS8-4.0-4.5	JB60888-4	Soil	Hexavalent Chromium
FS8-4.0-4.5	JB60888-4A	Soil	Metals
FS8-6.0-6.5	JB60888-5	Soil	Hexavalent Chromium
FS8-6.0-6.5	JB60888-5A	Soil	Metals
FS8-8.0-8.5	JB60888-6	Soil	Hexavalent Chromium
FS8-8.0-8.5	JB60888-6A	Soil	Metals
FS8GW-10.0-14.0	JB60888-7	Ground Water	Hexavalent Chromium
FS8GW-10.0-14.0	JB60888-7A	Ground Water	Metals
FS8GW-20.0-24.0	JB60888-12	Ground Water	Hexavalent Chromium
FS8GW-20.0-24.0	JB60888-12A	Ground Water	Metals
FS8GW-30.0-34.0	JB60888-18	Ground Water	Hexavalent Chromium
FS8GW-30.0-34.0	JB60888-18A	Ground Water	Metals
FS8GW-40.0-44.0	JB60888-24	Ground Water	Hexavalent Chromium
FS8GW-40.0-44.0	JB60888-24A	Ground Water	Metals
FS-FB20140228 (Equipment Blank)	JB60888-25	Aqueous	Hexavalent Chromium
FS-FB20140228 (Equipment Blank)	JB60888-25A	Aqueous	Metals

The samples were collected following the procedures detailed in the Remedial Investigation Work Plan - Soil for Non-Residential Chromate Chemical Production Waste Sites 114, 132, 133, 135, 137, 143, and 186, Jersey City, New Jersey, or applicable proposal or work plan, and the Field Sampling Plan/Quality Assurance Project Plan for Non-Residential and Residential Chromium Sites Hudson County, New Jersey (December 2011).

General Comments

The data package was complete. Quality control (QC) issues identified during validation are discussed below. Refer to the Target Analyte Summary Hit(s) in Attachment A for a listing of all detected results, qualified results, and associated qualifications, where applicable. The nonconformances for each section discussed below are presented in Attachment B.

The sample identified on the chain of custody and in the data package received from the laboratory as FS8-6.0-4.5 was later corrected to be FS8-6.0-6.5 per AECOM.

Hexavalent Chromium

Laboratory Blanks/Equipment Blanks

Method Blank

Negative drift for hexavalent chromium was detected in the continuing calibration blanks (CCBs) and the method blank, at comparable amounts, impacting the aqueous samples in this SDG. The nondetect hexavalent chromium result for the equipment blank FS-FB20140228 and all aqueous samples were qualified as estimated (UJ).

MS Results

Sample FS8-26.0-26.5 was selected for the matrix spike (MS) analysis associated with the soil samples in this SDG and was used for supporting data quality recommendations. The soluble and insoluble MS recoveries were 91.6% and 99.1%, respectively; which met the quality control (QC) criteria of 75-125%. The post digestion spike (PDS) recovery was 98.6%, which met the PDS criteria of 85-115%. No data qualification was required on the basis of spike recoveries.

Sample FS8GW-20.0-24.0 was selected for the MS analysis associated with the groundwater samples in this SDG. The MS recovery was 43.3%, which did not meet the QC criteria of 85-115%. Additionally, the pH-adjusted PDS was 67.3% and did not meet the PDS recovery criteria of 85-115%. Consequently, the hexavalent chromium results for all groundwater samples were qualified as estimated (UJ).

Field Duplicate Results

The field duplicate samples in this SDG were FS8-2.0-2.5 and FS8-2.0-2.5X.

The relative percent difference (RPD) for the reported hexavalent chromium field duplicate results exceeded the QC acceptance RPD; therefore, the reported hexavalent chromium results in all soil samples in this SDG were qualified as estimated (J/UJ).

Sample Results

Reported results (flagged B by the laboratory) that were less than the reporting limit (RL), but greater than or equal to the method detection limit (MDL) are approximate values and have been qualified as estimated (J).

Metals

Laboratory Blanks/Equipment Blanks

Method Blank

Negative instrument drift for nickel was detected in the method blank associated with the soil samples in this SDG. Since the results for nickel in the associated soils samples were greater than 10x the negative drift, no qualifications were required.

Negative instrument drift for thallium was detected in the method blank associated with the equipment blank FS-FB20140228 in this SDG. The nondetect result for thallium in the equipment blank was qualified as estimated (UJ) with potential low bias.

Equipment Blank

Chromium and vanadium were detected in the equipment blank associated with the soil samples in this SDG, at concentrations above the MDLs, but below the RLs. Since the associated soil sample results were greater than ten times the amount detected in the equipment blank, no qualifications were required.

MS Results

Soil sample FS8-16.0-16.5 is associated with the Method 6010 analysis of the soil samples in this SDG.

The recovery of antimony did not meet the QC criteria of 75-125%. The positive and nondetect results for antimony in the all soil samples were qualified as estimated (J/UJ) with potential low bias.

Field Duplicate Results

The field duplicate samples in this SDG were FS8-2.0-2.5 and FS8-2.0-2.5X.

The RPD for the reported vanadium field duplicate results exceeded the QC acceptance RPD of >35%, but <120%; therefore, the reported vanadium results in all the soil samples in this SDG were qualified as estimated (J).

The RPDs for the reported chromium and nickel field duplicate results exceeded the QC acceptance RPD of >120%; therefore, the reported chromium and nickel results greater than the reporting limit in all soil samples in this SDG were qualified as rejected (RA).

Sample Results

Reported results (flagged B by the laboratory) that were less than the RL, but greater than or equal to the MDL are approximate values that have been qualified as estimated (J).

Data Quality and Usability

In general, these data appear to be valid and may be used for decision-making purposes. The results for chromium and nickel in all soil samples were rejected; however, the results may be usable for project objectives as discussed below. Qualified results, if applicable, are presented in Attachments A and B.

The hexavalent chromium aqueous results in this SDG are usable as estimated values with the potential for low bias due to low soluble MS and or PDS recoveries.

The hexavalent chromium results in the equipment blank and groundwater samples are usable as estimated results with potential low bias based on negative instrument drift.

The hexavalent chromium results for all soil samples are usable as estimated values with an unknown bias due to field duplicate imprecision.

The thallium result in the equipment blank FS-FB20140228 is usable as an estimated value with potential low bias due to negative instrument drift.

The antimony results in the soil samples in this SDG are usable as estimated values with the potential for low bias due to low MS recovery.

The vanadium results in all soil samples are usable as estimated values with an unknown bias due to field duplicate imprecision.

The chromium and nickel results in all soil samples were rejected due to high field duplicate precision; however, the data user may use the results with caution as estimated values with an unknown bias due to field duplicate imprecision.

Sample results reported between the MDL and RL are usable as estimated values with an unknown directional bias.

ATTACHMENTS

Attachment A: Target Analyte Summary Hitlist(s)

Attachment B: Data Validation Report Form

Attachment A

Target Analyte Summary Hitlist(s)

Soil Target Analyte Summary Hit List (Hexavalent Chromium)

Site Name PPG Garfield Avenue Supplemental Remedial Investigation (GARIS) Forrest Street
Sampling Date February 28, 2014
Lab Name/ID Accutest, Dayton, NJ
SDG No JB60888
Sample Matrix Soil
Trip Blank ID NA
Field Blank ID FS-FB20140228

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
FS8-0.0-0.5	JB60888-1	CHROMIUM (HEXAVALENT)	U	3.3	3.3	0.47	Qualify	29
FS8-10.0-10.5	JB60888-8	CHROMIUM (HEXAVALENT)	U	0.25B	0.25	0.46	Qualify	29,31
FS8-12.0-12.5	JB60888-9	CHROMIUM (HEXAVALENT)	U	5.2	5.2	0.47	Qualify	29
FS8-14.0-14.5	JB60888-10	CHROMIUM (HEXAVALENT)	U	1.4	1.4	0.47	Qualify	29
FS8-16.0-16.5	JB60888-11	CHROMIUM (HEXAVALENT)	U	0.42B	0.42	0.47	Qualify	29,31
FS8-2.0-2.5	JB60888-2	CHROMIUM (HEXAVALENT)	U	12.4	12.4	0.49	Qualify	29
FS8-2.0-2.5X	JB60888-3	CHROMIUM (HEXAVALENT)	U	7.5	7.5	0.49	Qualify	29
FS8-20.0-20.5	JB60888-13	CHROMIUM (HEXAVALENT)	U	0.24B	0.24	0.44	Qualify	29,31
FS8-22.0-22.5	JB60888-14	CHROMIUM (HEXAVALENT)	U	0.16B	0.16	0.48	Qualify	29,31
FS8-24.0-24.5	JB60888-15	CHROMIUM (HEXAVALENT)	U	U	U	0.51	Qualify	29
FS8-26.0-26.5	JB60888-16	CHROMIUM (HEXAVALENT)	U	0.24B	0.24	0.52	Qualify	29,31
FS8-28.0-28.5	JB60888-17	CHROMIUM (HEXAVALENT)	U	0.12B	0.12	0.51	Qualify	29,31
FS8-30.0-30.5	JB60888-19	CHROMIUM (HEXAVALENT)	U	0.27B	0.27	0.48	Qualify	29,31
FS8-32.0-32.5	JB60888-20	CHROMIUM (HEXAVALENT)	U	U	U	0.48	Qualify	29
FS8-34.0-34.5	JB60888-21	CHROMIUM (HEXAVALENT)	U	0.11B	0.11	0.47	Qualify	29,31
FS8-36.0-36.5	JB60888-22	CHROMIUM (HEXAVALENT)	U	0.41B	0.41	0.49	Qualify	29,31
FS8-38.0-38.5	JB60888-23	CHROMIUM (HEXAVALENT)	U	0.32B	0.32	0.47	Qualify	29,31

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
FS8-4.0-4.5	JB60888-4	CHROMIUM (HEXAVALENT)	U	0.18B	0.18	0.53	Qualify	29,31
FS8-6.0-6.5	JB60888-5	CHROMIUM (HEXAVALENT)	U	0.17B	0.17	0.52	Qualify	29,31
FS8-8.0-8.5	JB60888-6	CHROMIUM (HEXAVALENT)	U	U	U	0.50	Qualify	29

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

NJDEP Laboratory Footnote

1. The value reported is less than or equal to 3x the value in the preparation/reagent blank. It is the policy of NJDEP-DPFSR to negate the reported value due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
2. The value reported is greater than three (3) times but less than ten (10) times the value in the preparation/reagent blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to the preparation/reagent blank contamination. The "B" qualifier alerts the end-user to the presence of this analyte in the preparation/reagent blank.
3. The value reported is less than or equal to three (3) times the value in the trip/field blank. It is the policy of NJDEP-DPFSR to negate the reported value as due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
4. The value reported is greater than three (3) times but less than ten (10) times the value in the trip/field blanks and is considered "real". However, the reported value must be quantitatively qualified "J" due to trip/field blank contamination.
5. The concentration reported by the laboratory is incorrectly calculated.
6. The laboratory failed to report the presence of the analyte in the sample.
7. The reported Hexavalent Chromium value was qualified because the Calibration Check Standard was not within the recovery range (90-110 percent).

8. In the Duplicate Sample Analysis, Hexavalent Chromium fell outside the control limits of ≤ 20 percent for sample results $> 4xRL$ or $+ RL$ for sample results $< 4xRL$. Therefore, the result was qualified.
9. This analyte was rejected because the laboratory performed the Duplicate Analysis on a field blank.
10. The reported value was qualified because the PVS recovery was greater than 115 percent.
11. The reported value was qualified because the PVS recovery was less than 85 percent.
12. The non-detected value was qualified (UJ) because the PVS recovery was less than 85 percent. The possibility of a false negative exists.
13. The reported analyte was qualified because the associated Calibration Blank result was greater than the MDL.
14. The laboratory made a transcription error. No hits were found in the raw data.
15. This analyte is qualified or rejected because the laboratory exceeded the holding time for digestion and/or analysis.
16. The laboratory subtracted the preparation/reagent blank from the sample result. The Reviewer's calculation puts the preparation/reagent blank back into the result.
17. The photocopy is unreadable. Therefore, the QA reviewer cannot read the laboratory's reported concentration result.
18. The reported value was qualified because the predigestion spike recovery was less than 75 %, but greater than 50%.
19. The reported value was qualified because the predigestion spike recovery was greater than 125 percent.
20. The non-detected value was qualified (UJ) because the redigestion spike recovery was less than 75 percent. The possibility of a false negative exists.
21. The reported result was qualified or rejected because the laboratory did not record the pH value(s) of the sample in a laboratory notebook.
22. The reported value was qualified (J/UJ) because the sample moisture content exceeded 50 percent.
23. The sample result was rejected because the soluble and insoluble matrix spike recoveries were less than 50%.

24. The detected sample result was qualified (J) because the incorrect spike concentration was used.
25. The reported sample results were rejected because the predigestion spike recovery was greater than 150 percent.
26. The reported sample results were rejected because the redigestion spike recovery was greater than 150 percent.
27. The reported value was qualified (J) because the redigestion spike recovery was less than 75 percent.
28. The reported value was qualified (J/UJ) because the sample digestion temperature was less than 90C.
29. In the Field Duplicate Sample Analysis, Hexavalent Chromium fell outside the control limits of $\leq 20\%$ for sample results $> 4xRL$ or $+ RL$ for sample results $< 4xRL$. Therefore, the result was qualified.
30. The reported value was qualified as estimated (J/UJ) but the bias is uncertain due to both high and low MS recoveries.
31. The reported result was greater than the MDL but less than the RL and qualified (J) as estimated by the laboratory.
32. The reported value was qualified because the sample replicate precision criterion of $\leq 20\%$ for method 7199 was exceeded.
33. The reported value was qualified (J/UJ) because the laboratory control sample (LCS) recovery was less than 80%.
34. The reported value was qualified (J) because the laboratory control sample (LCS) recovery was greater than 120%.
35. The reported result was qualified because the matrix spike analysis was not performed at the proper frequency.
36. The reported result was qualified because the laboratory duplicate analysis was not performed at the proper frequency.
37. The result was qualified because the cooler temperature upon sample receipt exceeded 6C.
38. The reported value was qualified because the redigestion spike recovery was greater than 125 percent.
39. The reported result was rejected because the laboratory failed to perform the reanalysis due to insufficient sample volume.
40. The reported results was qualified because the laboratory failed to analyze an ending CCB.

41. The reported result was qualified because the laboratory failed to make the proper method specific pH adjustment.
42. The reported result was rejected because the laboratory failed to reanalyze the MS and associated sample(s) due to failed MS recoveries.
43. The result was qualified because of negative instrument drift.

Aqueous Target Analyte Summary Hit List (Hexavalent Chromium)

Site Name PPG Garfield Avenue Supplemental Remedial Investigation (GARIS) Forrest Street
Sampling Date February 28, 2014
Lab Name/ID Accutest, Dayton, NJ
SDG No JB60888
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID NA

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/L)	Laboratory Sample Result (mg/L)	Validation Sample Result (mg/L)	RL (mg/L)	Quality Assurance Decision	NJDEP Validation Footnote
FS-FB20140228	JB60888-25	CHROMIUM (HEXAVALENT)	-0.0021	U	U	0.010	Qualify	43
FS8GW-10.0-14.0	JB60888-7	CHROMIUM (HEXAVALENT)	U	U	U	0.010	Qualify	12,43
FS8GW-20.0-24.0	JB60888-12	CHROMIUM (HEXAVALENT)	U	U	U	0.010	Qualify	12,43
FS8GW-30.0-34.0	JB60888-18	CHROMIUM (HEXAVALENT)	U	U	U	0.010	Qualify	12,43
FS8GW-40.0-44.0	JB60888-24	CHROMIUM (HEXAVALENT)	U	U	U	0.010	Qualify	12,43

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

NJDEP Laboratory Footnote

1. The value reported is less than or equal to 3x the value in the preparation/reagent blank. It is the policy of NJDEP-DPFSR to negate the reported value due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
2. The value reported is greater than three (3) times but less than ten (10) times the value in the preparation/reagent blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to the preparation/reagent blank contamination. The "B" qualifier alerts the end-user to the presence of this analyte in the preparation/reagent blank.
3. The value reported is less than or equal to three (3) times the value in the trip/field blank. It is the policy of NJDEP-DPFSR to negate the reported value as due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.

4. The value reported is greater than three (3) times but less than ten (10) times the value in the trip/field blanks and is considered "real". However, the reported value must be quantitatively qualified "J" due to trip/field blank contamination.
5. The concentration reported by the laboratory is incorrectly calculated.
6. The laboratory failed to report the presence of the analyte in the sample.
7. The reported Hexavalent Chromium value was qualified because the Calibration Check Standard was not within the recovery range (90-110 percent).
8. In the Duplicate Sample Analysis, Hexavalent Chromium fell outside the control limits of ≤ 20 percent for sample results $> 4xRL$ or $+ RL$ for sample results $< 4xRL$. Therefore, the result was qualified.
9. This analyte was rejected because the laboratory performed the Duplicate Analysis on a field blank.
10. The reported value was qualified because the PVS recovery was greater than 115 percent.
11. The reported value was qualified because the PVS recovery was less than 85 percent.
12. The non-detected value was qualified (UJ) because the PVS recovery was less than 85 percent. The possibility of a false negative exists.
13. The reported analyte was qualified because the associated Calibration Blank result was greater than the MDL.
14. The laboratory made a transcription error. No hits were found in the raw data.
15. This analyte is qualified or rejected because the laboratory exceeded the holding time for digestion and/or analysis.
16. The laboratory subtracted the preparation/reagent blank from the sample result. The Reviewer's calculation puts the preparation/reagent blank back into the result.
17. The photocopy is unreadable. Therefore, the QA reviewer cannot read the laboratory's reported concentration result.
18. The reported value was qualified because the predigestion spike recovery was less than 75 %, but greater than 50%.
19. The reported value was qualified because the predigestion spike recovery was greater than 125 percent.

20. The non-detected value was qualified (UJ) because the redigestion spike recovery was less than 75 percent. The possibility of a false negative exists.
21. The reported result was qualified or rejected because the laboratory did not record the pH value(s) of the sample in a laboratory notebook.
22. The reported value was qualified (J/UJ) because the sample moisture content exceeded 50 percent.
23. The sample result was rejected because the soluble and insoluble matrix spike recoveries were less than 50%.
24. The detected sample result was qualified (J) because the incorrect spike concentration was used.
25. The reported sample results were rejected because the predigestion spike recovery was greater than 150 percent.
26. The reported sample results were rejected because the redigestion spike recovery was greater than 150 percent.
27. The reported value was qualified (J) because the redigestion spike recovery was less than 75 percent.
28. The reported value was qualified (J/UJ) because the sample digestion temperature was less than 90C.
29. In the Field Duplicate Sample Analysis, Hexavalent Chromium fell outside the control limits of $\leq 20\%$ for sample results $> 4xRL$ or $+ RL$ for sample results $< 4xRL$. Therefore, the result was qualified.
30. The reported value was qualified as estimated (J/UJ) but the bias is uncertain due to both high and low MS recoveries.
31. The reported result was greater than the MDL but less than the RL and qualified (J) as estimated by the laboratory.
32. The reported value was qualified because the sample replicate precision criterion of $\leq 20\%$ for method 7199 was exceeded.
33. The reported value was qualified (J/UJ) because the laboratory control sample (LCS) recovery was less than 80%.
34. The reported value was qualified (J) because the laboratory control sample (LCS) recovery was greater than 120%.
35. The reported result was qualified because the matrix spike analysis was not performed at the proper frequency.

36. The reported result was qualified because the laboratory duplicate analysis was not performed at the proper frequency.
37. The result was qualified because the cooler temperature upon sample receipt exceeded 6C.
38. The reported value was qualified because the redigestion spike recovery was greater than 125 percent.
39. The reported result was rejected because the laboratory failed to perform the reanalysis due to insufficient sample volume.
40. The reported results was qualified because the laboratory failed to analyze an ending CCB.
41. The reported result was qualified because the laboratory failed to make the proper method specific pH adjustment.
42. The reported result was rejected because the laboratory failed to reanalyze the MS and associated sample(s) due to failed MS recoveries.
43. The result was qualified because of negative instrument drift.

Soil Target Analyte Summary Hit List (Metals)

Site Name PPG Garfield Avenue Supplemental Remedial Investigation (GARIS) Forrest Street
Sampling Date February 28, 2014
Lab Name/ID Accutest, Dayton, NJ
SDG No JB60888A
Sample Matrix Soil
Trip Blank ID NA
Field Blank ID FS-FB20140228

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
FS8-0.0-0.5	JB60888-1A	ANTIMONY	U	3.5	3.5	2.2	Qualify	15
FS8-0.0-0.5	JB60888-1A	CHROMIUM	U	1490	1490	1.1	Reject	19
FS8-0.0-0.5	JB60888-1A	NICKEL	-0.22	145	145	4.4	Reject	19
FS8-0.0-0.5	JB60888-1A	VANADIUM	U	84.8	84.8	5.5	Qualify	19
FS8-10.0-10.5	JB60888-8A	ANTIMONY	U	0.45B	0.45	2.4	Qualify	15,23
FS8-10.0-10.5	JB60888-8A	CHROMIUM	U	13.1	13.1	1.2	Reject	19
FS8-10.0-10.5	JB60888-8A	NICKEL	-0.22	8.2	8.2	4.8	Reject	19
FS8-10.0-10.5	JB60888-8A	VANADIUM	U	20.0	20.0	6.0	Qualify	19
FS8-12.0-12.5	JB60888-9A	ANTIMONY	U	0.50B	0.50	2.0	Qualify	15,23
FS8-12.0-12.5	JB60888-9A	CHROMIUM	U	23.3	23.3	1.0	Reject	19
FS8-12.0-12.5	JB60888-9A	NICKEL	-0.22	13.4	13.4	4.0	Reject	19
FS8-12.0-12.5	JB60888-9A	VANADIUM	U	27.5	27.5	5.1	Qualify	19
FS8-14.0-14.5	JB60888-10A	ANTIMONY	U	0.50B	0.50	2.3	Qualify	15,23
FS8-14.0-14.5	JB60888-10A	CHROMIUM	U	18.5	18.5	1.2	Reject	19
FS8-14.0-14.5	JB60888-10A	NICKEL	-0.22	12.3	12.3	4.6	Reject	19
FS8-14.0-14.5	JB60888-10A	VANADIUM	U	28.5	28.5	5.8	Qualify	19
FS8-16.0-16.5	JB60888-11A	ANTIMONY	U	0.27B	0.27	2.3	Qualify	15,23
FS8-16.0-16.5	JB60888-11A	CHROMIUM	U	13.0	13.0	1.1	Reject	19

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
FS8-16.0-16.5	JB60888-11A	NICKEL	-0.22	7.0	7.0	4.5	Reject	19
FS8-16.0-16.5	JB60888-11A	VANADIUM	U	13.2	13.2	5.6	Qualify	19
FS8-2.0-2.5	JB60888-2A	ANTIMONY	U	4.2	4.2	2.0	Qualify	15
FS8-2.0-2.5	JB60888-2A	CHROMIUM	U	1220	1220	0.98	Reject	19
FS8-2.0-2.5	JB60888-2A	NICKEL	-0.22	50.6	50.6	3.9	Reject	19
FS8-2.0-2.5	JB60888-2A	THALLIUM	U	0.60B	0.60	0.98	Qualify	23
FS8-2.0-2.5	JB60888-2A	VANADIUM	U	57.0	57.0	4.9	Qualify	19
FS8-2.0-2.5X	JB60888-3A	ANTIMONY	U	0.43B	0.43	2.0	Qualify	15,23
FS8-2.0-2.5X	JB60888-3A	CHROMIUM	U	11.8	11.8	0.99	Reject	19
FS8-2.0-2.5X	JB60888-3A	NICKEL	-0.22	9.2	9.2	4.0	Reject	19
FS8-2.0-2.5X	JB60888-3A	THALLIUM	U	0.32B	0.32	0.99	Qualify	23
FS8-2.0-2.5X	JB60888-3A	VANADIUM	U	17.6	17.6	5.0	Qualify	19
FS8-20.0-20.5	JB60888-13A	ANTIMONY	U	0.40B	0.40	2.2	Qualify	15,23
FS8-20.0-20.5	JB60888-13A	CHROMIUM	U	16.3	16.3	1.1	Reject	19
FS8-20.0-20.5	JB60888-13A	NICKEL	-0.22	10.3	10.3	4.4	Reject	19
FS8-20.0-20.5	JB60888-13A	VANADIUM	U	20.3	20.3	5.6	Qualify	19
FS8-22.0-22.5	JB60888-14A	ANTIMONY	U	U	U	2.0	Qualify	15
FS8-22.0-22.5	JB60888-14A	CHROMIUM	U	8.1	8.1	1.0	Reject	19
FS8-22.0-22.5	JB60888-14A	NICKEL	-0.22	3.8B	3.8	4.0	Reject	19,23
FS8-22.0-22.5	JB60888-14A	VANADIUM	U	10.0	10.0	5.0	Qualify	19
FS8-24.0-24.5	JB60888-15A	ANTIMONY	U	0.46B	0.46	2.0	Qualify	15,23
FS8-24.0-24.5	JB60888-15A	CHROMIUM	U	14.2	14.2	1.0	Reject	19
FS8-24.0-24.5	JB60888-15A	NICKEL	-0.22	12.4	12.4	4.0	Reject	19
FS8-24.0-24.5	JB60888-15A	VANADIUM	U	17.7	17.7	5.0	Qualify	19
FS8-26.0-26.5	JB60888-16A	ANTIMONY	U	U	U	2.6	Qualify	15

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
FS8-26.0-26.5	JB60888-16A	CHROMIUM	U	8.0	8.0	1.3	Reject	19
FS8-26.0-26.5	JB60888-16A	NICKEL	-0.22	5.3	5.3	5.2	Reject	19
FS8-26.0-26.5	JB60888-16A	VANADIUM	U	11.4	11.4	6.5	Qualify	19
FS8-28.0-28.5	JB60888-17A	ANTIMONY	U	0.25B	0.25	2.0	Qualify	15,23
FS8-28.0-28.5	JB60888-17A	CHROMIUM	U	10.8	10.8	1.0	Reject	19
FS8-28.0-28.5	JB60888-17A	NICKEL	-0.22	8.0	8.0	4.0	Reject	19
FS8-28.0-28.5	JB60888-17A	VANADIUM	U	14.3	14.3	5.0	Qualify	19
FS8-30.0-30.5	JB60888-19A	ANTIMONY	U	U	U	2.0	Qualify	15
FS8-30.0-30.5	JB60888-19A	CHROMIUM	U	20.4	20.4	1.0	Reject	19
FS8-30.0-30.5	JB60888-19A	NICKEL	-0.22	11.6	11.6	4.0	Reject	19
FS8-30.0-30.5	JB60888-19A	VANADIUM	U	12.4	12.4	5.1	Qualify	19
FS8-32.0-32.5	JB60888-20A	ANTIMONY	U	U	U	2.0	Qualify	15
FS8-32.0-32.5	JB60888-20A	CHROMIUM	U	6.1	6.1	1.0	Reject	19
FS8-32.0-32.5	JB60888-20A	NICKEL	-0.22	4.0	4.0	4.0	Reject	19
FS8-32.0-32.5	JB60888-20A	VANADIUM	U	9.1	9.1	5.0	Qualify	19
FS8-34.0-34.5	JB60888-21A	ANTIMONY	U	U	U	2.0	Qualify	15
FS8-34.0-34.5	JB60888-21A	CHROMIUM	U	8.2	8.2	0.98	Reject	19
FS8-34.0-34.5	JB60888-21A	NICKEL	-0.22	5.6	5.6	3.9	Reject	19
FS8-34.0-34.5	JB60888-21A	VANADIUM	U	12.1	12.1	4.9	Qualify	19
FS8-36.0-36.5	JB60888-22A	ANTIMONY	U	0.39B	0.39	2.0	Qualify	15,23
FS8-36.0-36.5	JB60888-22A	CHROMIUM	U	13.0	13.0	0.98	Reject	19
FS8-36.0-36.5	JB60888-22A	NICKEL	-0.22	10.9	10.9	3.9	Reject	19
FS8-36.0-36.5	JB60888-22A	VANADIUM	U	17.1	17.1	4.9	Qualify	19
FS8-38.0-38.5	JB60888-23A	ANTIMONY	U	0.28B	0.28	2.0	Qualify	15,23
FS8-38.0-38.5	JB60888-23A	CHROMIUM	U	9.4	9.4	1.0	Reject	19

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
FS8-38.0-38.5	JB60888-23A	NICKEL	-0.22	7.1	7.1	4.1	Reject	19
FS8-38.0-38.5	JB60888-23A	VANADIUM	U	12.9	12.9	5.1	Qualify	19
FS8-4.0-4.5	JB60888-4A	ANTIMONY	U	1.2B	1.2	2.0	Qualify	15,23
FS8-4.0-4.5	JB60888-4A	CHROMIUM	U	20.9	20.9	1.0	Reject	19
FS8-4.0-4.5	JB60888-4A	NICKEL	-0.22	25.5	25.5	4.0	Reject	19
FS8-4.0-4.5	JB60888-4A	VANADIUM	U	18.3	18.3	5.0	Qualify	19
FS8-6.0-6.5	JB60888-5A	ANTIMONY	U	1.1B	1.1	2.1	Qualify	23
FS8-6.0-6.5	JB60888-5A	CHROMIUM	U	41.1	41.1	1.0	Reject	19
FS8-6.0-6.5	JB60888-5A	NICKEL	-0.22	26.2	26.2	4.1	Reject	19
FS8-6.0-6.5	JB60888-5A	VANADIUM	U	19.2	19.2	5.1	Qualify	19
FS8-8.0-8.5	JB60888-6A	ANTIMONY	U	0.65B	0.65	1.9	Qualify	23
FS8-8.0-8.5	JB60888-6A	CHROMIUM	U	15.4	15.4	0.96	Reject	19
FS8-8.0-8.5	JB60888-6A	NICKEL	-0.22	15.0	15.0	3.8	Reject	19
FS8-8.0-8.5	JB60888-6A	THALLIUM	U	0.37B	0.37	0.96	Qualify	23
FS8-8.0-8.5	JB60888-6A	VANADIUM	U	18.7	18.7	4.8	Qualify	19

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

NJDEP Laboratory Footnote

1. The value reported is less than or equal to 3x the value in the method blank. It is the policy of NJDEP-DPFSR to negate the reported value due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
2. The value reported is greater than three (3) but less than ten (10) times the value in the method blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to the method blank contamination. The "B" qualifier alerts the end-user to the presence of this analyte in the method blank.

3. The value reported is less than or equal to 3x the value in the trip/field blank. It is the policy of NJDEP-DPFSR to negate the reported value as due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
4. The value reported is greater than 3x but less than ten (10) the value in the trip/field blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to trip/field blank contamination.
5. The concentration reported by the laboratory is incorrectly calculated.
6. The laboratory failed to report the presence of the analyte in the sample.
7. The reported metal value was qualified because the Calibration Verification Standard was not within the recovery range (90-110 percent).
8. In the MS/MSD Sample Analysis, this analyte fell outside the control limits of 20% RPD. Therefore, the result was qualified.
9. This analyte was qualified because the laboratory performed the MS/MSD Analysis on a field blank.
10. The reported analyte was qualified because the associated Calibration Blank result was greater than the MDL.
11. The reported value was qualified because serial dilution analysis was not within QC limit of 10% D.
12. This analyte is rejected because the laboratory exceeded the holding time for digestion and analysis.
13. The laboratory subtracted the method blank from the sample result. The reviewer's calculation has added the method blank result to the reported concentration.
14. The photocopy submitted is illegible. Therefore, the QA reviewer cannot read the laboratory's reported concentration result.
15. The reported or nondetected value was qualified because the MS/MSD spike recovery was less than 75 percent.
16. The reported value was qualified because the MS/MSD spike recovery was greater than 125 percent.
17. The reported value was qualified as estimated (J/UJ) but the bias is uncertain due to both high and low MS recoveries.
18. The reported values were qualified because the laboratory duplicate exceeded 35 percent RPD for results greater than 5X the reporting limit or the absolute difference exceeded two times the reporting limit for sample result less than 5 times the reporting limit.

19. The reported value was qualified because the field duplicate exceeded 35 percent RPD for results greater than 5X the reporting limit or the absolute difference exceeded two times the reporting limit for sample result less than 5 times the reporting limit.
20. The reported value was qualified because the LCS recovery was less than 80 percent.
21. The reported value was qualified because the sample moisture content was greater than 50 percent.
22. The reported value was rejected because the field duplicate absolute difference was greater than 4 times the RL or the RPD was greater than 120%.
23. The reported result was greater than the MDL but less than the RL and qualified (J) as estimated by the laboratory.
24. The field duplicate absolute difference exceeded two times the reporting limit for sample result less than 5 times the reporting limit.
25. The reported value was qualified because the LCS recovery was greater than 120 percent.
26. The result was qualified because of negative instrument drift.

Aqueous Target Analyte Summary Hit List (Metals)

Site Name PPG Garfield Avenue Supplemental Remedial Investigation (GARIS) Forrest Street
Sampling Date February 28, 2014
Lab Name/ID Accutest, Dayton, NJ
SDG No JB60888A
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID NA

Field Sample ID	Lab Sample ID	Analyte	Method Blank (ug/L)	Laboratory Sample Result (ug/L)	Validation Sample Result (ug/L)	RL (ug/L)	Quality Assurance Decision	NJDEP Validation Footnote
FS-FB20140228	JB60888-25A	CHROMIUM	U	3.4B	3.4	10	Qualify	23
FS-FB20140228	JB60888-25A	VANADIUM	U	0.80B	0.80	50	Qualify	23
FS-FB20140228	JB60888-25A	THALLIUM	-1.3	U	U	2.0	Qualify	26
FS8GW-10.0-14.0	JB60888-7A	CHROMIUM	U	2250	2250	50		
FS8GW-20.0-24.0	JB60888-12A	CHROMIUM	U	2200	2200	50		
FS8GW-30.0-34.0	JB60888-18A	CHROMIUM	U	2700	2700	50		
FS8GW-40.0-44.0	JB60888-24A	CHROMIUM	U	6090	6090	50		

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

NJDEP Laboratory Footnote

1. The value reported is less than or equal to 3x the value in the method blank. It is the policy of NJDEP-DPFSR to negate the reported value due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
2. The value reported is greater than three (3) but less than ten (10) times the value in the method blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to the method blank contamination. The "B" qualifier alerts the end-user to the presence of this analyte in the method blank.

3. The value reported is less than or equal to 3x the value in the trip/field blank. It is the policy of NJDEP-DPFSR to negate the reported value as due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
4. The value reported is greater than 3x but less than ten (10) the value in the trip/field blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to trip/field blank contamination.
5. The concentration reported by the laboratory is incorrectly calculated.
6. The laboratory failed to report the presence of the analyte in the sample.
7. The reported metal value was qualified because the Calibration Verification Standard was not within the recovery range (90-110 percent).
8. In the MS/MSD Sample Analysis, this analyte fell outside the control limits of 20% RPD. Therefore, the result was qualified.
9. This analyte was qualified because the laboratory performed the MS/MSD Analysis on a field blank.
10. The reported analyte was qualified because the associated Calibration Blank result was greater than the MDL.
11. The reported value was qualified because serial dilution analysis was not within QC limit of 10% D.
12. This analyte is rejected because the laboratory exceeded the holding time for digestion and analysis.
13. The laboratory subtracted the method blank from the sample result. The reviewer's calculation has added the method blank result to the reported concentration.
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15. The reported or nondetected value was qualified because the MS/MSD spike recovery was less than 75 percent.
16. The reported value was qualified because the MS/MSD spike recovery was greater than 125 percent.
17. The reported value was qualified as estimated (J/UJ) but the bias is uncertain due to both high and low MS recoveries.
18. The reported values were qualified because the laboratory duplicate exceeded 35 percent RPD for results greater than 5X the reporting limit or the absolute difference exceeded two times the reporting limit for sample result less than 5 times the reporting limit.

19. The reported value was qualified because the field duplicate exceeded 35 percent RPD for results greater than 5X the reporting limit or the absolute difference exceeded two times the reporting limit for sample result less than 5 times the reporting limit.
20. The reported value was qualified because the LCS recovery was less than 80 percent.
21. The reported value was qualified because the sample moisture content was greater than 50 percent.
22. The reported value was rejected because the field duplicate absolute difference was greater than 4 times the RL or the RPD was greater than 120%.
23. The reported result was greater than the MDL but less than the RL and qualified (J) as estimated by the laboratory.
24. The field duplicate absolute difference exceeded two times the reporting limit for sample result less than 5 times the reporting limit.
25. The reported value was qualified because the LCS recovery was greater than 120 percent.
26. The result was qualified because of negative instrument drift.

Attachment B

Data Validation Report Form

Client Name: PPG Industries	Project Number: 60154801.6001A
Site Location: PPG Garfield Avenue Supplemental Remedial Investigation (GARIS) Forrest Street Groundwater and Soil, Jersey City, NJ	Project Manager: William Spronz
Laboratory: Accutest, Dayton, NJ	Type of Validation: Full
Laboratory Job No: JB60888	Date Checked: 4/28/14
Validator: Paula DiMattei	Peer: Lisa Krowitz

ITEM	YES	NO	N/A	COMMENTS
Sample results included?	X			
Reporting Limits met project requirements?	X			
Field I.D. included?	X			
Laboratory I.D. included?	X			
Sample matrix included?	X			
Sample receipt temperature 2-6C?	X			
Signed COCs included?	X			
Date of sample collection included?	X			
Date of sample digestion included?	X			
Holding time to digestion met criteria? (Soils -30 days from collection to digestion.)	X			
Date of analysis included?	X			
Holding time to analysis met criteria? (Soils -168 hours from digestion to analysis; Aqueous - 24 hours from collection to analysis.)	X			
Method reference included?	X			
Laboratory Case Narrative included?	X			

Definitions: MDL Method Detection Limit; %R Percent Recovery; RL Reporting Limit; RPD Relative Percent Difference; RSD Relative Standard Deviation :Corr Correlation Coefficient.

ITEM	YES	NO	N/A	COMMENTS
Initial calibration documentation included in lab package?	X			
1) Blank plus 4 standards (7196A) or blank plus 3 standards (7199)	X			
2) Correlation coefficient of =0.995 (7196A) or =0.999 (7199)	X			
3) Calibrate daily or each time instrument is set up.	X			
Calibration Check Standard (CCS) for 7196A and Quality Control Sample (QCS) for 7199 Included in Lab Package?	X			
1) %R criteria met? (90 - 110%)	X			
2) Correct frequency of one per every 10 samples	X			
3) CCS and QCS from independent source and at mid-level of calibration curve	X			
Calibration Blanks	X			
1) Analyzed prior to initial calibration standards and after each CCS/QCS?	X			
2) Absolute value should not exceed MDL.		X		See nonconformance table below
Method Blank, Field Blanks and/or Equipment Blanks Included in Lab Package?	X			FS-FB20140228
1) Method blank analyzed with each preparation batch?	X			
2) Absolute value should not exceed MDL.	X			
Eh and pH Data	X			
1) Eh and pH data was included and plotted for all samples?	X			
Soluble Matrix Spike Data Included in Lab Package?	X			Soil: FS8-26.0-26.5 and AQ: FS8GW-20.0-24.0 (see nonconformance table below)
1) Soluble Matrix %R criteria met? (75-125%R).	X			
2) Was the spike concentration 40 mg/Kg or twice the sample concentration?	X			
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	X			
Insoluble Matrix Spike Data Included in Lab Package?	X			
1) Insoluble Matrix %R criteria met? (75-125%R).	X			
2) Was the spike concentration around 400 to 800 mg/Kg?		X		Spiked at 1450 mg/kg. No impact to data.
3) Was a sample spiked at the frequency of 1 per batch or 20	X			

ITEM	YES	NO	N/A	COMMENTS
samples?				
Post Digestion Spike	X			
1) Post Digestion Spike %R criteria met? (85-115%R).	X			
2) Was the spike concentration 40 mg/Kg or twice the sample concentration?	X			
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	X			
Sample Duplicate Data Included in Lab Package?	X			FS8-26.0-26.5
1) RPD criteria met? (RPD ≤20%) if both results are ≤4x RL or absolute difference ≤RL if either or both results are <4xRL.	X			
2) Was a sample duplicate analyzed at the frequency of 1 per batch or 20 samples?	X			
Was a Laboratory Control Sample (LCS) Included in Lab Package?	X			
1) %R criteria met? (80-120%R).	X			
2) Was an LCS analyzed at the frequency of 1/batch or 20 samples?	X			
Were any Field Duplicate samples submitted with this SDG?	X			
1) Were Field duplicate RPD criteria met? (RPD≤20% for both sample results >4xRL or absolute difference ≤ RL if either or both results are <4xRL.		X		See nonconformance table below.
Were all sample quantitation and reporting requirements met?	X			
1) Were all solid samples reported with percent solids > 50% ?	X			
2) Were any samples analyzed or reported with dilutions?		X		
Miscellaneous Items	X			
1) For soils by 7196A, was the pH within a range of 7.0-8.0?	X			
2) For soils by 7199, was the pH within a range of 9.0-9.5?			X	
3) For aqueous by 7196A, was the pH with a range of 1.5-2.5?	X			
4) For soils (3060A), was the digestion temperature 90-95C for at least 60 minutes?	X			
5) For 7199, was each sample injected twice and was the RPD =20?			X	

Laboratory Blanks

Blank ID	Analyte	Result	QL	Units	Associated Samples
GN345-MB1	CHROMIUM (HEXAVALENT)	-0.0021	0.01	mg/L	All aqueous samples

Matrix Spikes

Sample ID	Analyte	Analysis Batch	MS % Recovery	pH-adjusted PDS % Recovery	Lower Limit	Upper Limit
FS8GW-20.0-24.0	CHROMIUM (HEXAVALENT)	GN345	43.3	67.3	85	115

Field Duplicates

Sample ID	Duplicate ID	Analyte	Sample Result	Qual	Duplicate Result	Qual	QL	Units	RPD
FS8-2.0-2.5	FS8-2.0-2.5X	CHROMIUM (HEXAVALENT)	12.4		7.5		0.49	mg/kg	49.2

SDG#: JB60888
Batch: GN532
 Cr+6 ICAL 03/4/14
 Soil
 (p. 91 of data pkg)

x - concentration	y - response
0	0
0.01	0.009
0.05	0.043
0.1	0.091
0.3	0.269
0.5	0.445
0.8	0.691
1	0.889

(p. 91 of data pkg)

AECOM Calculated Intercept	0.0010	OK	Reported intercept	0.0010
AECOM Slope	0.8800	OK	Reported Slope	0.88
AECOM Calculated r	0.99981	OK	Reported r	0.99981

GP78279-B1
p.91

LCS calculation
 Background Absorbance 0
 Total absorbance 0.871
 Total absorbance - background 0.871
 Instrument Concentration 0.989
 Sample weight (mg/kg) 0.0025
 Final Volume (L) 0.1
 Dilution Factor 1

AECOM Calculated LCS Result (mg/Kg)	39.5	OK	Reported Result (mg/Kg)	39.5
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%R = Found/True*100 **p. 61**

True Value (mg/kg) 40

AECOM Calculated %R	98.9	OK rounding	Reported %R	98.8
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MS calculation **JB60888-16 [FS8-26.0-26.5]p.91**

Background reading 0
 Total absorbance 0.491
 Total absorbance - background 0.491
 Instrument Concentration 0.5568
 Sample weight (mg/kg) 0.0025
 Final Volume (L) 0.1
 Percent solids 0.775
 Dilution Factor 50

AECOM Calculated MS Result (mg/Kg)	1440	OK	Reported Result (mg/Kg)	1440
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%R = Found/True*100 **JB60888-16 [FS8-26.0-26.5]p.63**

True Value (mg/kg) 1450

Native concentration (mg/Kg) 0.24

AECOM%R	99.1	OK rounding	Reported %R	99.1
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Percent Solids **JB60888-16 [FS8-26.0-26.5]p.66**

Empty dish weight= 19.55

Wet weight= 27.15

Dry weight= 25.44

AECOM%solids =	77.5	OK	reported %solids=	77.5
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Reporting Limit**JB60888-16 [FS8-26.0-26.5] p.29**

Low Standard	0.01
Initial weight (mg/kg)	0.00241
Final volume (L)	0.1
Percent solids	0.775
Dilution Factor	1

Reporting Limit	0.54	OK rounding	Reported RL (mg/Kg)=	0.52
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Sample Calculations**JB60888-16 [FS8-26.0-26.5]p.29, 91**

Background reading	0
Total absorbance	0.005
Total absorbance - background	0.005
Instrument Response	0.005
Sample weight (mg/kg)	0.00241
Final Volume (L)	0.1
Percent solids	0.775
Dilution Factor	1

AECOM Calculated Result (mg/Kg)	0.24	OK	Reported Result (mg/Kg)	0.24
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JB60888-1 [FS8-0.0-0.5]p.14, 91

Background reading	0.011
Total absorbance	0.075
Total absorbance - background	0.064
Instrument Response	0.072
Sample weight (mg/kg)	0.0025
Final Volume (L)	0.1
Percent solids	0.86
Dilution Factor	1

AECOM Calculated Result (mg/Kg)	3.3	OK	Reported Result (mg/Kg)	3.3
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Client Name: PPG Industries	Project Number: 60154801.6001A
Site Location: PPG Garfield Avenue Supplemental Remedial Investigation (GARIS) Forrest Street Groundwater and Soil, Jersey City, NJ	Project Manager: William Spronz
Laboratory: Accutest, Dayton, NJ	Type of Validation: Limited
Laboratory Job No: JB60888A	Date Checked: 4/28/14
Validator: Paula DiMattei	Peer: Lisa Krowitz

ITEM	YES	NO	N/A	COMMENTS
Sample results included?	X			
Reporting Limits met project requirements?	X			
Field I.D. included?	X			
Laboratory I.D. included?	X			
Sample matrix included?	X			
Sample receipt temperature 2-6C?	X			
Signed COCs included?	X			
Date of sample collection included?	X			
Date of sample digestion included?	X			
Date of analysis included?	X			
Holding time met QC criteria? (Metals -180 days from sample collection; Mercury - 28 days from sample collection. If HT exceeded by 10 days R all results.	X			
Method reference included?	X			
Laboratory Case Narrative included?	X			

Definitions: MDL Method Detection Limit; %R Percent Recovery; RL Reporting Limit; RPD Relative Percent Difference; RSD Relative Standard Deviation :Corr Correlation Coefficient.

ITEM	YES	NO	N/A	COMMENTS
Sample dilutions?		X		
Initial calibration documentation included in lab package?			X	NA for Limited review
1) Calibrate daily or each time instrument is set up.			X	
2) ICP (6010) -Blank plus 1 standard? If no, reject (R) data.			X	
3) Hg (7470/7471) -Blank plus 5 standards? If no, reject (R) data.			X	
Initial Calibration Verification Standard (ICV) for ICP (6010) and Initial Calibration Check Standard (ICCS) for Hg (7470/7471) included in lab package?			X	
1) Analyzed immediately after initial calibration? If no, reject (R) data.			X	
2) %R criteria met? (90-110%). If no, J positive results for affected analyte(s) if %R between 80-89% and 111-120% and indicate bias; UJ non-detect results for affected analyte(s) if %R between 80-89% , and R all data for affected analyte(s) if %R 120%.			X	
3) Spot check ICV/ICCS results for several analytes.			X	
Continuing Calibration Verification Standard (CCV) for ICP (6010) and Calibration Check Standard (CCS) for Hg (7470/7471) included in Lab Package?			X	
1) Analyzed immediately after each ICV/ICC/CB and after every 10 samples? If no, reject (R) data.			X	
2) CCS and CCV from independent source and at mid-level of calibration curve. If no, reject (R) data.			X	
3) %R criteria met? (90-110%R). If no, J positive results for affected analyte(s) if %R between 80-89% and 111-120% and indicate bias; UJ non-detect results for affected analyte(s) if %R between 80-89% and R all data for affected analyte(s) if %R 120%.			X	
4) Spot check CCV/CCS results for several analytes.			X	
Low Calibration Standard (CRI) included in Lab Package?			X	
1) %R criteria met? - 50-150% for Co, Mn, Zn, by ICP-MS; Pb, Tl by 6010; 70-130% all others. If no, refer to ILM05.4 NJ SOP 5.A.2 for actions.			X	

ITEM	YES	NO	N/A	COMMENTS
Calibration Blanks			X	NA for a Limited review
1) Analyzed after daily calibration and after each ICV/ICC/CCV/CCS and after every 10 samples? If no, reject (R) data.			X	
2) Absolute value 10xCB result, no qualification.			X	
Method Blank Included in Lab Package?	X			
1) Method blank analyzed with each preparation batch or every SDG, or 1/20 samples? If no, reject (R) data, except no aqueous MB required for FB/EB if only soil samples were analyzed.	X			
2) Method blank analyzed 1/20 samples? If - MB 1/25, J sample results from 21-25; -MB >1/25, R sample results after 25th sample.	X			
3) MB results nondetect? If no, -sample result 3xMB but 10xMB, no qualification.		X		See nonconformance table below
4) Negative MB result reported? If yes, -Positive sample result	X			See nonconformance table below
Field Blanks/Equipment Blanks Included in Lab Package?	X			FS-FB20140228
1) FB/EB result non-detect? If no, -sample result 3xFB/EB but 10xFB/EB, no qualification.		X		See nonconformance table below
ICP Interference Check Sample (ICS) included in Lab Package?			X	NA for a Limited review
1) Analyzed at beginning of analytical run? If no, reject (R) data.			X	
2) %R criteria met? (80-120%) If no, %R>120%, no qualification if sample result non-detect; %R between 121-150%, J positive results, biased high; %R between 50-79%, J/UJ results, biased low; %R150%, reject (R) result			X	
3) Spot check accuracy of %Rs			X	
Matrix Spike/Matrix Spike Duplicate Data Included in Lab Package?	X			Soils:FS8-16.0-16.5 and Aqueous: Batch QC (not assessed).
1) MS/MSD %R (75-125%R) and RPD (+20%) criteria met? - %R>125% J positive results for affected analyte(s) for all samples in the same batch/SDG, accept NDs; -%R		X		See nonconformance table below.
2) Was a sample spiked at the frequency of 1/batch or 20 samples?	X			
3) Was the MS performed on a site sample?	X			
4) Was the MS performed on a FB/EB or TB? If yes, J all sample data.		X		

ITEM	YES	NO	N/A	COMMENTS
Post Digestion Spike			X	NA for a Limited review
1) %R criteria met? (75-125%R) - %R>125% J positive results for affected analyte(s) for all samples in the same batch/SDG, accept NDs.; - %R			X	
2) Was the spike performed on a FB/EB or TB? If yes, J all sample data.			X	
3) Was a sample spiked at the frequency of 1/batch or 20 samples?			X	
Laboratory Duplicate Data Included in Lab Package?		X		An MS/MSD was performed in lieu of a laboratory duplicate.
Aqueous - If RPD is >20% but 5x the QL, estimate (J) results >the QL. - If RPD is >100%, reject R results >/= the QL.- If sample and/or duplicate is the QL, estimate (J) positive results 2x the QL, reject R non-detects and positive results			X	
Soil - If RPD is >35% but 5x the QL, estimate (J) results > the QL. - If RPD is >120%, reject results > the QL. - If sample and/or duplicate is 2x the QL, estimate (J) positive results 4x the QL, reject nondetects and positive results			X	
Was a Laboratory Control Sample (LCS) Included in Lab Package?	X			
1) LCS %R criteria met? (80-120%R). If no, J/UJ all affected analytes(s) for all samples in the same batch/SDG.	X			
2) Was an LCS analyzed at the frequency of 1/batch or 20 samples? If no, J/UJ affected analyte(s) for all samples in the same batch/SDG.	X			
Serial Dilution			X	NA for a Limited review
1) %D(25xIDL (7000) or >10xIDL (6010) and %D >10% J positive results for affected analyte(s) for all samples in the same batch/SDG, accept NDs.			X	
2) Was the frequency 1/batch or 20 samples?			X	
3) Was a site sample used?			X	
4) Was a FB/EB or TB used? If yes, J all sample data.			X	
5) Spot check accuracy of %Ds.			X	

ITEM	YES	NO	N/A	COMMENTS
Field Duplicate Data included in Lab Package?	X			FS8-2.0-2.5 and FS8-2.0-2.5X
Aqueous - If RPD is >20% but 5x the QL, estimate (J) results > the QL. - If RPD is >100%, reject R results >= the QL. - If sample and/or duplicate is the QL, estimate (J) positive results 2x the QL, reject R non-detects and positive results			X	
Soil - If RPD is >35% but 5x the QL, estimate (J) results > the QL. - If RPD is >120%, reject results > the QL. - If sample and/or duplicate is 2x the QL, estimate (J) positive results 4x the QL, reject nondetects and positive results		X		See nonconformance table below.
Percent Solids data included in Lab Package?	X			
1) %Solids criteria (Reg 2 criteria) met? (>=50%)	X			

Laboratory Blanks

Blank ID	Analyte	Result	QL	Units	Associated Samples
MP78075-MB1	Thallium	-1.3	2.0	ug/L	FS-FB20140228
MP78086-MB1	Nickel	-0.22	4.0	mg/kg	All soil samples

Field Blanks

Blank ID	Analyte	Result	QL	Units	Associated Samples
FS-FB20140228	CHROMIUM	3.4	10	ug/l	All soil samples
FS-FB20140228	VANADIUM	0.80	50	ug/l	

Matrix Spikes

Sample ID	Analyte	Analysis Batch	MS % Recovery	MSD % Recovery	Lower Limit	Upper Limit
FS8-16.0-16.5	ANTIMONY	MP78086	55.2	50.0	75	125

Field Duplicates

Sample ID	Duplicate ID	Analyte	Sample Result	Qual	Duplicate Result	Qual	QL	Units	RPD
FS8-2.0-2.5	FS8-2.0-2.5X	Chromium	1220		11.8		0.98	mg/kg	196.2
FS8-2.0-2.5	FS8-2.0-2.5X	Nickel	50.6		9.2		3.9	mg/kg	138.5
FS8-2.0-2.5	FS8-2.0-2.5X	Vanadium	57.0		17.6		4.9	mg/kg	105.6

Data Validation Report

Project:	PPG Garfield Avenue Supplemental Remedial Investigation (GARIS) Forrest Street Groundwater and Soil	
Laboratory:	Accutest, Dayton, NJ	
Laboratory Job No.:	JB61029 and JB61029A	
Analysis/Method:	Hexavalent Chromium SW846 3060A/7196 Metals by ICP-AES/ SW846-6010	
Validation Level:	Full (Hexavalent Chromium) Limited (Metals)	
Site Location/Address:	Forrest Street, Jersey City, NJ	
AECOM Project No:	60154801.6001A	
Prepared by:	Paula DiMattei /AECOM	Completed on: 04/29/2014
Reviewed by:	Lisa Krowitz /AECOM	File Name: JB61029_A_2014-04-29_DV Report-F

Introduction

The data were reviewed in accordance with the FSP-QAPP and the following NJDEP validation Standard Operating Procedures (SOP):

- NJDEP Office of Data Quality SOP 5.A.10, Rev 3 (September 2009), SOP for Analytical Data Validation of Hexavalent Chromium - for USEPA SW-846 Method 3060A, USEPA SW-846 Method 7196A and USEPA SW-846 Method 7199;
- NJDEP Office of Data Quality SOP 5.A.16, Rev 1 (May 2002), Quality Assurance Data Validation of Analytical Deliverables for Inorganics (based on USEPA SW-846 Methods)

The results of quality control data analyzed with site samples were used to assess the overall reliability of the data. The following qualifiers were used to identify data quality issues:

- U: Indicates the analyte was not detected in the sample above the sample reporting limit.
- J: Indicates the result was an estimated value; the associated numerical value was an approximate concentration of the analyte in the sample.
- UJ: Indicates the analyte was not detected above the reporting limit and the reporting limit was approximate.
- R: The sample result was rejected due to serious deficiencies; the presence or absence of the analyte could not be confirmed.
- RA: The sample result was rejected but is still considered usable.

Sample Information

The samples listed below were collected by AECOM on March 4, 2014 as part of the PPG Garfield Avenue Supplemental Remedial Investigation (GARIS) Forrest Street Groundwater and Soil sampling at the PPG Forrest Street, Jersey City, NJ. Only the samples and parameters listed below were validated.

Field ID	Laboratory ID	Matrix	Fraction
FS10-0.3-0.8	JB61029-1	Soil	Hexavalent Chromium
FS10-0.3-0.8	JB61029-1A	Soil	Metals
FS10-10.0-10.5	JB61029-8	Soil	Hexavalent Chromium
FS10-10.0-10.5	JB61029-8A	Soil	Metals
FS10-12.0-12.5	JB61029-9	Soil	Hexavalent Chromium
FS10-12.0-12.5	JB61029-9A	Soil	Metals
FS10-2.0-2.5	JB61029-2	Soil	Hexavalent Chromium
FS10-2.0-2.5	JB61029-2A	Soil	Metals
FS10-2.0-2.5X (Field Duplicate of FS10-2.0-2.5)	JB61029-3	Soil	Hexavalent Chromium
FS10-2.0-2.5X (Field Duplicate of FS10-2.0-2.5)	JB61029-3A	Soil	Metals
FS10-20.0-20.5	JB61029-10	Soil	Hexavalent Chromium
FS10-20.0-20.5	JB61029-10A	Soil	Metals
FS10-22.0-22.5	JB61029-11	Soil	Hexavalent Chromium
FS10-22.0-22.5	JB61029-11A	Soil	Metals
FS10-24.0-24.5	JB61029-12	Soil	Hexavalent Chromium
FS10-24.0-24.5	JB61029-12A	Soil	Metals
FS10-26.0-26.5	JB61029-14	Soil	Hexavalent Chromium
FS10-26.0-26.5	JB61029-14A	Soil	Metals
FS10-28.0-28.5	JB61029-15	Soil	Hexavalent Chromium
FS10-28.0-28.5	JB61029-15A	Soil	Metals
FS10-30.0-30.5	JB61029-17	Soil	Hexavalent Chromium
FS10-30.0-30.5	JB61029-17A	Soil	Metals
FS10-32.0-32.5	JB61029-18	Soil	Hexavalent Chromium
FS10-32.0-32.5	JB61029-18A	Soil	Metals
FS10-34.0-34.5	JB61029-19	Soil	Hexavalent Chromium
FS10-34.0-34.5	JB61029-19A	Soil	Metals
FS10-36.0-36.5	JB61029-20	Soil	Hexavalent Chromium
FS10-36.0-36.5	JB61029-20A	Soil	Metals
FS10-38.0-38.5	JB61029-21	Soil	Hexavalent Chromium
FS10-38.0-38.5	JB61029-21A	Soil	Metals
FS10-4.0-4.5	JB61029-4	Soil	Hexavalent Chromium
FS10-4.0-4.5	JB61029-4A	Soil	Metals
FS10-40.0-40.5	JB61029-22	Soil	Hexavalent Chromium

Field ID	Laboratory ID	Matrix	Fraction
FS10-40.0-40.5	JB61029-22A	Soil	Metals
FS10-6.0-6.5	JB61029-5	Soil	Hexavalent Chromium
FS10-6.0-6.5	JB61029-5A	Soil	Metals
FS10-8.0-8.5	JB61029-6	Soil	Hexavalent Chromium
FS10-8.0-8.5	JB61029-6A	Soil	Metals
FS10GW-10.0-14.0	JB61029-7	Ground Water	Hexavalent Chromium
FS10GW-10.0-14.0	JB61029-7A	Ground Water	Metals
FS10GW-20.0-24.0	JB61029-13	Ground Water	Hexavalent Chromium
FS10GW-20.0-24.0	JB61029-13A	Ground Water	Metals
FS10GW-30.0-34.0	JB61029-16	Ground Water	Hexavalent Chromium
FS10GW-30.0-34.0	JB61029-16A	Ground Water	Metals
FS10GW-40.0-44.0	JB61029-23	Ground Water	Hexavalent Chromium
FS10GW-40.0-44.0	JB61029-23A	Ground Water	Metals
FS-FB20140304 (Equipment Blank)	JB61029-24	Aqueous	Hexavalent Chromium
FS-FB20140304 (Equipment Blank)	JB61029-24A	Aqueous	Metals

The samples were collected following the procedures detailed in the Remedial Investigation Work Plan - Soil for Non-Residential Chromate Chemical Production Waste Sites 114, 132, 133, 135, 137, 143, and 186, Jersey City, New Jersey, or applicable proposal or work plan, and the Field Sampling Plan/Quality Assurance Project Plan for Non-Residential and Residential Chromium Sites Hudson County, New Jersey (December 2011).

General Comments

The data package was complete. Quality control (QC) issues identified during validation are discussed below. Refer to the Target Analyte Summary Hit(s) in Attachment A for a listing of all detected results, qualified results, and associated qualifications, where applicable. The nonconformances for each section discussed below are presented in Attachment B.

Hexavalent Chromium

Laboratory Blanks/Equipment Blanks

Method Blank

Negative drift for hexavalent chromium was detected in the continuing calibration blanks (CCBs) and the method blanks, at comparable amounts, impacting the aqueous and soil samples in this SDG. The positive and nondetect hexavalent chromium result for the equipment blank FS-FB201400304, all groundwater samples, and all soil samples were qualified as estimated (J/UJ).

MS Results

Sample FS10-0.3-0.8 (JB61029-1) was selected for the matrix spike (MS) analysis associated with the soil samples in this SDG and was used for supporting data quality recommendations. The soluble and insoluble MS recoveries were 89.4% and 93.9%, respectively; which met the quality control (QC) criteria of 75-125%. The post digestion spike (PDS) recovery was 101%, which met the PDS criteria of 85-115%. No data qualification was required on the basis of spike recoveries.

Sample FS10GW-10.0-14.0 (JB61029-7) was selected for the MS analysis associated with the groundwater samples in this SDG and was used for supporting data quality recommendations. The MS recovery was 93.3%; which met the QC criteria of 85-115%. No data qualification was required on the basis of spike recoveries.

Laboratory Duplicate Precision

Sample FS10-0.3-0.8 was selected by the laboratory to demonstrate laboratory precision capabilities.

The relative percent difference (RPD) for hexavalent chromium exceeded the QC acceptance RPD; therefore, the hexavalent chromium results in all soil samples were qualified as estimated (J/UJ).

Field Duplicate Results

The field duplicate samples in this SDG were FS10-2.0-2.5 and FS10-2.0-2.5X.

The RPD for the reported hexavalent chromium field duplicate results exceeded the QC acceptance RPD; therefore, the reported hexavalent chromium results in all the soil samples in this SDG were qualified as estimated (J/UJ).

Sample Results

Reported results (flagged B by the laboratory) that were less than the reporting limit (RL), but greater than or equal to the method detection limit (MDL) are approximate values and have been qualified as estimated (J).

Metals

Laboratory Blanks/Equipment Blanks

Method Blank

Chromium was detected in the method blank (MP78101-MB1) associated with some of the soil samples in this SDG, at a concentration above the MDL, but below the RL. Since the results for chromium in the associated soil samples were greater than ten times the amount detected in the method blank, no qualifications were required.

MS Results

Sample FS10-0.3-0.8 was associated with the Method 6010 analysis of the soil samples in this SDG.

The recoveries of antimony and chromium did not meet the QC criteria of 75-125%. The positive and nondetect results for antimony in all soil samples were qualified as estimated (J/UJ) with potential for low bias. The positive results for chromium in all soil samples were qualified as estimated (J) with the potential for high bias. The positive results for vanadium in all soil samples were qualified as estimated (J) with potential bias in an unknown direction due to high MS/MSD RPD.

Sample Results

Reported results (flagged B by the laboratory) that were less than the RL, but greater than or equal to the MDL are approximate values that have been qualified as estimated (J).

Data Quality and Usability

In general, these data appear to be valid and may be used for decision-making purposes. No data were rejected. Qualified results, if applicable, are presented in Attachments A and B.

The hexavalent chromium results in all samples are usable as estimated values with a potential low bias due to negative instrument drift. In addition, all soil hexavalent chromium results are usable as estimated values due to poor laboratory duplicate and field duplicate precision.

Sample results for antimony qualified due to low MS recoveries are usable as estimated values with the potential for low bias.

Sample results for chromium qualified due to high MS recoveries are usable as estimated values with the potential for high bias.

Sample results for vanadium qualified due to poor MS/MSD precision are usable as estimated values with an unknown directional bias.

Sample results reported between the MDL and RL are usable as estimated values with an unknown directional bias.

ATTACHMENTS

Attachment A: Target Analyte Summary Hitlist(s)

Attachment B: Data Validation Report Form

Attachment A

Target Analyte Summary Hitlist(s)

Soil Target Analyte Summary Hit List (Hexavalent Chromium)

Site Name PPG Garfield Avenue Supplemental Remedial Investigation (GARIS) Forrest Street
Sampling Date March 4, 2014
Lab Name/ID Accutest, Dayton, NJ
SDG No JB61029
Sample Matrix Soil
Trip Blank ID NA
Field Blank ID FS-FB20140304

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
FS10-0.3-0.8	JB61029-1	CHROMIUM (HEXAVALENT)	-0.128	2.3	2.3	0.42	Qualify	8,29,43
FS10-10.0-10.5	JB61029-8	CHROMIUM (HEXAVALENT)	-0.128	47.0	47.0	0.50	Qualify	8,29,43
FS10-12.0-12.5	JB61029-9	CHROMIUM (HEXAVALENT)	-0.128	4.0	4.0	0.47	Qualify	8,29,43
FS10-2.0-2.5	JB61029-2	CHROMIUM (HEXAVALENT)	-0.128	21.0	21.0	0.48	Qualify	8,29,43
FS10-2.0-2.5X	JB61029-3	CHROMIUM (HEXAVALENT)	-0.128	26.3	26.3	0.49	Qualify	8,29,43
FS10-20.0-20.5	JB61029-10	CHROMIUM (HEXAVALENT)	-0.128	1.5	1.5	0.49	Qualify	8,29,43
FS10-22.0-22.5	JB61029-11	CHROMIUM (HEXAVALENT)	-0.128	1.3	1.3	0.48	Qualify	8,29,43
FS10-24.0-24.5	JB61029-12	CHROMIUM (HEXAVALENT)	-0.128	U	U	0.49	Qualify	8,29,43
FS10-26.0-26.5	JB61029-14	CHROMIUM (HEXAVALENT)	-0.128	U	U	0.48	Qualify	8,29,43
FS10-28.0-28.5	JB61029-15	CHROMIUM (HEXAVALENT)	-0.128	U	U	0.50	Qualify	8,29,43
FS10-30.0-30.5	JB61029-17	CHROMIUM (HEXAVALENT)	-0.128	U	U	0.48	Qualify	8,29,43
FS10-32.0-32.5	JB61029-18	CHROMIUM (HEXAVALENT)	-0.128	U	U	0.50	Qualify	8,29,43
FS10-34.0-34.5	JB61029-19	CHROMIUM (HEXAVALENT)	-0.128	0.58	0.58	0.48	Qualify	8,29,43
FS10-36.0-36.5	JB61029-20	CHROMIUM (HEXAVALENT)	-0.128	7.1	7.1	0.51	Qualify	8,29,43
FS10-38.0-38.5	JB61029-21	CHROMIUM (HEXAVALENT)	-0.128	U	U	0.49	Qualify	8,29,43
FS10-4.0-4.5	JB61029-4	CHROMIUM (HEXAVALENT)	-0.128	U	U	0.47	Qualify	8,29,43
FS10-40.0-40.5	JB61029-22	CHROMIUM (HEXAVALENT)	-0.128	0.58	0.58	0.49	Qualify	8,29,43
FS10-6.0-6.5	JB61029-5	CHROMIUM (HEXAVALENT)	-0.128	U	U	0.54	Qualify	8,29,43

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
FS10-8.0-8.5	JB61029-6	CHROMIUM (HEXAVALENT)	-0.128	5.6	5.6	0.52	Qualify	8,29,43

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

NJDEP Laboratory Footnote

1. The value reported is less than or equal to 3x the value in the preparation/reagent blank. It is the policy of NJDEP-DPFSR to negate the reported value due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
2. The value reported is greater than three (3) times but less than ten (10) times the value in the preparation/reagent blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to the preparation/reagent blank contamination. The "B" qualifier alerts the end-user to the presence of this analyte in the preparation/reagent blank.
3. The value reported is less than or equal to three (3) times the value in the trip/field blank. It is the policy of NJDEP-DPFSR to negate the reported value as due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
4. The value reported is greater than three (3) times but less than ten (10) times the value in the trip/field blanks and is considered "real". However, the reported value must be quantitatively qualified "J" due to trip/field blank contamination.
5. The concentration reported by the laboratory is incorrectly calculated.
6. The laboratory failed to report the presence of the analyte in the sample.
7. The reported Hexavalent Chromium value was qualified because the Calibration Check Standard was not within the recovery range (90-110 percent).
8. In the Duplicate Sample Analysis, Hexavalent Chromium fell outside the control limits of ≤ 20 percent for sample results $> 4xRL$ or $+ RL$ for sample results $< 4xRL$. Therefore, the result was qualified.
9. This analyte was rejected because the laboratory performed the Duplicate Analysis on a field blank.

10. The reported value was qualified because the PVS recovery was greater than 115 percent.
11. The reported value was qualified because the PVS recovery was less than 85 percent.
12. The non-detected value was qualified (UJ) because the PVS recovery was less than 85 percent. The possibility of a false negative exists.
13. The reported analyte was qualified because the associated Calibration Blank result was greater than the MDL.
14. The laboratory made a transcription error. No hits were found in the raw data.
15. This analyte is qualified or rejected because the laboratory exceeded the holding time for digestion and/or analysis.
16. The laboratory subtracted the preparation/reagent blank from the sample result. The Reviewer's calculation puts the preparation/reagent blank back into the result.
17. The photocopy is unreadable. Therefore, the QA reviewer cannot read the laboratory's reported concentration result.
18. The reported value was qualified because the predigestion spike recovery was less than 75 %, but greater than 50%.
19. The reported value was qualified because the predigestion spike recovery was greater than 125 percent.
20. The non-detected value was qualified (UJ) because the redigestion spike recovery was less than 75 percent. The possibility of a false negative exists.
21. The reported result was qualified or rejected because the laboratory did not record the pH value(s) of the sample in a laboratory notebook.
22. The reported value was qualified (J/UJ) because the sample moisture content exceeded 50 percent.
23. The sample result was rejected because the soluble and insoluble matrix spike recoveries were less than 50%.
24. The detected sample result was qualified (J) because the incorrect spike concentration was used.
25. The reported sample results were rejected because the predigestion spike recovery was greater than 150 percent.

26. The reported sample results were rejected because the redigestion spike recovery was greater than 150 percent.
27. The reported value was qualified (J) because the redigestion spike recovery was less than 75 percent.
28. The reported value was qualified (J/UJ) because the sample digestion temperature was less than 90C.
29. In the Field Duplicate Sample Analysis, Hexavalent Chromium fell outside the control limits of $\leq 20\%$ for sample results $> 4xRL$ or $+ RL$ for sample results $< 4xRL$. Therefore, the result was qualified.
30. The reported value was qualified as estimated (J/UJ) but the bias is uncertain due to both high and low MS recoveries.
31. The reported result was greater than the MDL but less than the RL and qualified (J) as estimated by the laboratory.
32. The reported value was qualified because the sample replicate precision criterion of $\leq 20\%$ for method 7199 was exceeded.
33. The reported value was qualified (J/UJ) because the laboratory control sample (LCS) recovery was less than 80%.
34. The reported value was qualified (J) because the laboratory control sample (LCS) recovery was greater than 120%.
35. The reported result was qualified because the matrix spike analysis was not performed at the proper frequency.
36. The reported result was qualified because the laboratory duplicate analysis was not performed at the proper frequency.
37. The result was qualified because the cooler temperature upon sample receipt exceeded 6C.
38. The reported value was qualified because the redigestion spike recovery was greater than 125 percent.
39. The reported result was rejected because the laboratory failed to perform the reanalysis due to insufficient sample volume.
40. The reported results was qualified because the laboratory failed to analyze an ending CCB.
41. The reported result was qualified because the laboratory failed to make the proper method specific pH adjustment.
42. The reported result was rejected because the laboratory failed to reanalyze the MS and associated sample(s) due to failed MS recoveries.

43. The result was qualified because of negative instrument drift.

Aqueous Target Analyte Summary Hit List (Hexavalent Chromium)

Site Name PPG Garfield Avenue Supplemental Remedial Investigation (GARIS) Forrest Street
Sampling Date March 4, 2014
Lab Name/ID Accutest, Dayton, NJ
SDG No JB61029
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID NA

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/L)	Laboratory Sample Result (mg/L)	Validation Sample Result (mg/L)	RL (mg/L)	Quality Assurance Decision	NJDEP Validation Footnote
FS-FB20140304	JB61029-24	CHROMIUM (HEXAVALENT)	-0.003	U	U	0.010	Qualify	43
FS10GW-10.0-14.0	JB61029-7	CHROMIUM (HEXAVALENT)	-0.003	U	U	0.010	Qualify	43
FS10GW-20.0-24.0	JB61029-13	CHROMIUM (HEXAVALENT)	-0.003	U	U	0.010	Qualify	43
FS10GW-30.0-34.0	JB61029-16	CHROMIUM (HEXAVALENT)	-0.003	U	U	0.010	Qualify	43
FS10GW-40.0-44.0	JB61029-23	CHROMIUM (HEXAVALENT)	-0.003	0.0036B	0.0036	0.010	Qualify	31,43

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

NJDEP Laboratory Footnote

1. The value reported is less than or equal to 3x the value in the preparation/reagent blank. It is the policy of NJDEP-DPFSR to negate the reported value due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
2. The value reported is greater than three (3) times but less than ten (10) times the value in the preparation/reagent blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to the preparation/reagent blank contamination. The "B" qualifier alerts the end-user to the presence of this analyte in the preparation/reagent blank.
3. The value reported is less than or equal to three (3) times the value in the trip/field blank. It is the policy of NJDEP-DPFSR to negate the reported value as due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.

4. The value reported is greater than three (3) times but less than ten (10) times the value in the trip/field blanks and is considered "real". However, the reported value must be quantitatively qualified "J" due to trip/field blank contamination.
5. The concentration reported by the laboratory is incorrectly calculated.
6. The laboratory failed to report the presence of the analyte in the sample.
7. The reported Hexavalent Chromium value was qualified because the Calibration Check Standard was not within the recovery range (90-110 percent).
8. In the Duplicate Sample Analysis, Hexavalent Chromium fell outside the control limits of ≤ 20 percent for sample results $> 4xRL$ or $+ RL$ for sample results $< 4xRL$. Therefore, the result was qualified.
9. This analyte was rejected because the laboratory performed the Duplicate Analysis on a field blank.
10. The reported value was qualified because the PVS recovery was greater than 115 percent.
11. The reported value was qualified because the PVS recovery was less than 85 percent.
12. The non-detected value was qualified (UJ) because the PVS recovery was less than 85 percent. The possibility of a false negative exists.
13. The reported analyte was qualified because the associated Calibration Blank result was greater than the MDL.
14. The laboratory made a transcription error. No hits were found in the raw data.
15. This analyte is qualified or rejected because the laboratory exceeded the holding time for digestion and/or analysis.
16. The laboratory subtracted the preparation/reagent blank from the sample result. The Reviewer's calculation puts the preparation/reagent blank back into the result.
17. The photocopy is unreadable. Therefore, the QA reviewer cannot read the laboratory's reported concentration result.
18. The reported value was qualified because the predigestion spike recovery was less than 75 %, but greater than 50%.
19. The reported value was qualified because the predigestion spike recovery was greater than 125 percent.

20. The non-detected value was qualified (UJ) because the redigestion spike recovery was less than 75 percent. The possibility of a false negative exists.
21. The reported result was qualified or rejected because the laboratory did not record the pH value(s) of the sample in a laboratory notebook.
22. The reported value was qualified (J/UJ) because the sample moisture content exceeded 50 percent.
23. The sample result was rejected because the soluble and insoluble matrix spike recoveries were less than 50%.
24. The detected sample result was qualified (J) because the incorrect spike concentration was used.
25. The reported sample results were rejected because the predigestion spike recovery was greater than 150 percent.
26. The reported sample results were rejected because the redigestion spike recovery was greater than 150 percent.
27. The reported value was qualified (J) because the redigestion spike recovery was less than 75 percent.
28. The reported value was qualified (J/UJ) because the sample digestion temperature was less than 90C.
29. In the Field Duplicate Sample Analysis, Hexavalent Chromium fell outside the control limits of $\leq 20\%$ for sample results $> 4xRL$ or $+ RL$ for sample results $< 4xRL$. Therefore, the result was qualified.
30. The reported value was qualified as estimated (J/UJ) but the bias is uncertain due to both high and low MS recoveries.
31. The reported result was greater than the MDL but less than the RL and qualified (J) as estimated by the laboratory.
32. The reported value was qualified because the sample replicate precision criterion of $\leq 20\%$ for method 7199 was exceeded.
33. The reported value was qualified (J/UJ) because the laboratory control sample (LCS) recovery was less than 80%.
34. The reported value was qualified (J) because the laboratory control sample (LCS) recovery was greater than 120%.
35. The reported result was qualified because the matrix spike analysis was not performed at the proper frequency.

36. The reported result was qualified because the laboratory duplicate analysis was not performed at the proper frequency.
37. The result was qualified because the cooler temperature upon sample receipt exceeded 6C.
38. The reported value was qualified because the redigestion spike recovery was greater than 125 percent.
39. The reported result was rejected because the laboratory failed to perform the reanalysis due to insufficient sample volume.
40. The reported results was qualified because the laboratory failed to analyze an ending CCB.
41. The reported result was qualified because the laboratory failed to make the proper method specific pH adjustment.
42. The reported result was rejected because the laboratory failed to reanalyze the MS and associated sample(s) due to failed MS recoveries.
43. The result was qualified because of negative instrument drift.

Soil Target Analyte Summary Hit List (Metals)

Site Name PPG Garfield Avenue Supplemental Remedial Investigation (GARIS) Forrest Street
Sampling Date March 4, 2014
Lab Name/ID Accutest, Dayton, NJ
SDG No JB61029A
Sample Matrix Soil
Trip Blank ID NA
Field Blank ID FS-FB20140304

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
FS10-0.3-0.8	JB61029-1A	ANTIMONY	U	U	U	2.1	Qualify	15
FS10-0.3-0.8	JB61029-1A	CHROMIUM	0.20	21.9	21.9	1.0	Qualify	
FS10-0.3-0.8	JB61029-1A	NICKEL	U	12.7	12.7	4.1		
FS10-0.3-0.8	JB61029-1A	THALLIUM	U	0.37B	0.37	1.0	Qualify	23
FS10-0.3-0.8	JB61029-1A	VANADIUM	U	43.5	43.5	5.1	Qualify	8
FS10-10.0-10.5	JB61029-8A	ANTIMONY	U	U	U	2.4	Qualify	15
FS10-10.0-10.5	JB61029-8A	CHROMIUM	0.20	100	100	1.2	Qualify	
FS10-10.0-10.5	JB61029-8A	NICKEL	U	10.8	10.8	4.8		
FS10-10.0-10.5	JB61029-8A	VANADIUM	U	22.6	22.6	6.1	Qualify	8
FS10-12.0-12.5	JB61029-9A	ANTIMONY	U	U	U	2.4	Qualify	15
FS10-12.0-12.5	JB61029-9A	CHROMIUM	0.20	43.9	43.9	1.2	Qualify	
FS10-12.0-12.5	JB61029-9A	NICKEL	U	12.5	12.5	4.9		
FS10-12.0-12.5	JB61029-9A	THALLIUM	U	0.38B	0.38	1.2	Qualify	23
FS10-12.0-12.5	JB61029-9A	VANADIUM	U	23.9	23.9	6.1	Qualify	8
FS10-2.0-2.5	JB61029-2A	ANTIMONY	U	2.0B	2.0	2.5	Qualify	15,23
FS10-2.0-2.5	JB61029-2A	CHROMIUM	0.20	960	960	1.3	Qualify	16
FS10-2.0-2.5	JB61029-2A	NICKEL	U	94.5	94.5	5.0		
FS10-2.0-2.5	JB61029-2A	THALLIUM	U	0.53B	0.53	1.3	Qualify	23

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
FS10-2.0-2.5	JB61029-2A	VANADIUM	U	103	103	6.3	Qualify	8
FS10-2.0-2.5X	JB61029-3A	ANTIMONY	U	2.6	2.6	2.5	Qualify	15
FS10-2.0-2.5X	JB61029-3A	CHROMIUM	0.20	1120	1120	1.3	Qualify	16
FS10-2.0-2.5X	JB61029-3A	NICKEL	U	91.3	91.3	5.1		
FS10-2.0-2.5X	JB61029-3A	THALLIUM	U	0.76B	0.76	1.3	Qualify	23
FS10-2.0-2.5X	JB61029-3A	VANADIUM	U	97.8	97.8	6.3	Qualify	8
FS10-20.0-20.5	JB61029-10A	ANTIMONY	U	U	U	2.5	Qualify	15
FS10-20.0-20.5	JB61029-10A	CHROMIUM	0.20	15.2	15.2	1.3	Qualify	16
FS10-20.0-20.5	JB61029-10A	NICKEL	U	9.5	9.5	5.1		
FS10-20.0-20.5	JB61029-10A	THALLIUM	U	0.91B	0.91	1.3	Qualify	23
FS10-20.0-20.5	JB61029-10A	VANADIUM	U	17.5	17.5	6.4	Qualify	8
FS10-22.0-22.5	JB61029-11A	ANTIMONY	U	U	U	2.4	Qualify	15
FS10-22.0-22.5	JB61029-11A	NICKEL	U	9.9	9.9	4.7		
FS10-22.0-22.5	JB61029-11A	THALLIUM	U	0.39B	0.39	1.2	Qualify	23
FS10-22.0-22.5	JB61029-11A	VANADIUM	U	16.8	16.8	5.9	Qualify	8
FS10-22.0-22.5	JB61029-11A	CHROMIUM	0.20	16.6	16.6	1.2	Qualify	16
FS10-24.0-24.5	JB61029-12A	ANTIMONY	U	U	U	2.4	Qualify	15
FS10-24.0-24.5	JB61029-12A	CHROMIUM	0.20	8.8	8.8	1.2	Qualify	16
FS10-24.0-24.5	JB61029-12A	NICKEL	U	3.4B	3.4	4.8	Qualify	23
FS10-24.0-24.5	JB61029-12A	VANADIUM	U	9.7	9.7	6.0	Qualify	8
FS10-26.0-26.5	JB61029-14A	ANTIMONY	U	U	U	2.5	Qualify	15
FS10-26.0-26.5	JB61029-14A	CHROMIUM	0.20	8.9	8.9	1.2	Qualify	16
FS10-26.0-26.5	JB61029-14A	NICKEL	U	4.4B	4.4	5.0	Qualify	23
FS10-26.0-26.5	JB61029-14A	THALLIUM	U	0.37B	0.37	1.2	Qualify	23
FS10-26.0-26.5	JB61029-14A	VANADIUM	U	10.8	10.8	6.2	Qualify	8

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
FS10-28.0-28.5	JB61029-15A	ANTIMONY	U	U	U	2.6	Qualify	15
FS10-28.0-28.5	JB61029-15A	CHROMIUM	0.20	12.1	12.1	1.3	Qualify	16
FS10-28.0-28.5	JB61029-15A	NICKEL	U	9.7	9.7	5.1		
FS10-28.0-28.5	JB61029-15A	THALLIUM	U	0.45B	0.45	1.3	Qualify	23
FS10-28.0-28.5	JB61029-15A	VANADIUM	U	16.1	16.1	6.4	Qualify	8
FS10-30.0-30.5	JB61029-17A	ANTIMONY	U	U	U	2.4	Qualify	15
FS10-30.0-30.5	JB61029-17A	CHROMIUM	0.20	19.4	19.4	1.2	Qualify	16
FS10-30.0-30.5	JB61029-17A	NICKEL	U	10.9	10.9	4.9		
FS10-30.0-30.5	JB61029-17A	THALLIUM	U	0.45B	0.45	1.2	Qualify	23
FS10-30.0-30.5	JB61029-17A	VANADIUM	U	13.4	13.4	6.1	Qualify	8
FS10-32.0-32.5	JB61029-18A	ANTIMONY	U	U	U	2.5	Qualify	15
FS10-32.0-32.5	JB61029-18A	CHROMIUM	0.20	7.4	7.4	1.3	Qualify	16
FS10-32.0-32.5	JB61029-18A	NICKEL	U	4.4B	4.4	5.0	Qualify	23
FS10-32.0-32.5	JB61029-18A	VANADIUM	U	12.1	12.1	6.3	Qualify	8
FS10-34.0-34.5	JB61029-19A	ANTIMONY	U	U	U	2.3	Qualify	15
FS10-34.0-34.5	JB61029-19A	CHROMIUM	0.20	11.4	11.4	1.2	Qualify	16
FS10-34.0-34.5	JB61029-19A	NICKEL	U	7.1	7.1	4.6		
FS10-34.0-34.5	JB61029-19A	THALLIUM	U	0.39B	0.39	1.2	Qualify	23
FS10-34.0-34.5	JB61029-19A	VANADIUM	U	13.9	13.9	5.8	Qualify	8
FS10-36.0-36.5	JB61029-20A	ANTIMONY	U	U	U	2.5	Qualify	15
FS10-36.0-36.5	JB61029-20A	CHROMIUM	0.20	17.3	17.3	1.3	Qualify	16
FS10-36.0-36.5	JB61029-20A	NICKEL	U	16.7	16.7	5.0		
FS10-36.0-36.5	JB61029-20A	THALLIUM	U	0.53B	0.53	1.3	Qualify	23
FS10-36.0-36.5	JB61029-20A	VANADIUM	U	21.4	21.4	6.3	Qualify	8
FS10-38.0-38.5	JB61029-21A	ANTIMONY	U	U	U	2.3	Qualify	15

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
FS10-38.0-38.5	JB61029-21A	CHROMIUM	0.20	10.2	10.2	1.2	Qualify	16
FS10-38.0-38.5	JB61029-21A	NICKEL	U	6.9	6.9	4.7		
FS10-38.0-38.5	JB61029-21A	VANADIUM	U	14.5	14.5	5.9	Qualify	8
FS10-4.0-4.5	JB61029-4A	ANTIMONY	U	U	U	2.4	Qualify	15
FS10-4.0-4.5	JB61029-4A	CHROMIUM	0.20	55.5	55.5	1.2	Qualify	16
FS10-4.0-4.5	JB61029-4A	NICKEL	U	20.0	20.0	4.7		
FS10-4.0-4.5	JB61029-4A	VANADIUM	U	27.6	27.6	5.9	Qualify	8
FS10-40.0-40.5	JB61029-22A	ANTIMONY	U	U	U	2.5	Qualify	15
FS10-40.0-40.5	JB61029-22A	CHROMIUM	0.20	9.3	9.3	1.3	Qualify	16
FS10-40.0-40.5	JB61029-22A	NICKEL	U	6.6	6.6	5.0		
FS10-40.0-40.5	JB61029-22A	VANADIUM	U	14.1	14.1	6.3	Qualify	8
FS10-6.0-6.5	JB61029-5A	ANTIMONY	U	U	U	2.8	Qualify	15
FS10-6.0-6.5	JB61029-5A	CHROMIUM	0.20	15.6	15.6	1.4	Qualify	16
FS10-6.0-6.5	JB61029-5A	NICKEL	U	16.8	16.8	5.5		
FS10-6.0-6.5	JB61029-5A	VANADIUM	U	20.1	20.1	6.9	Qualify	8
FS10-8.0-8.5	JB61029-6A	ANTIMONY	U	3.0	3.0	2.6	Qualify	15
FS10-8.0-8.5	JB61029-6A	CHROMIUM	0.20	2910	2910	1.3	Qualify	16
FS10-8.0-8.5	JB61029-6A	NICKEL	U	16.4	16.4	5.2		
FS10-8.0-8.5	JB61029-6A	VANADIUM	U	20.6	20.6	6.5	Qualify	8

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

NJDEP Laboratory Footnote

1. The value reported is less than or equal to 3x the value in the method blank. It is the policy of NJDEP-DPFSR to negate the reported value due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.

2. The value reported is greater than three (3) but less than ten (10) times the value in the method blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to the method blank contamination. The "B" qualifier alerts the end-user to the presence of this analyte in the method blank.
3. The value reported is less than or equal to 3x the value in the trip/field blank. It is the policy of NJDEP-DPFSR to negate the reported value as due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
4. The value reported is greater than 3x but less than ten (10) the value in the trip/field blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to trip/field blank contamination.
5. The concentration reported by the laboratory is incorrectly calculated.
6. The laboratory failed to report the presence of the analyte in the sample.
7. The reported metal value was qualified because the Calibration Verification Standard was not within the recovery range (90-110 percent).
8. In the MS/MSD Sample Analysis, this analyte fell outside the control limits of 20% RPD. Therefore, the result was qualified.
9. This analyte was qualified because the laboratory performed the MS/MSD Analysis on a field blank.
10. The reported analyte was qualified because the associated Calibration Blank result was greater than the MDL.
11. The reported value was qualified because serial dilution analysis was not within QC limit of 10% D.
12. This analyte is rejected because the laboratory exceeded the holding time for digestion and analysis.
13. The laboratory subtracted the method blank from the sample result. The reviewer's calculation has added the method blank result to the reported concentration.
14. The photocopy submitted is illegible. Therefore, the QA reviewer cannot read the laboratory's reported concentration result.
15. The reported or nondetected value was qualified because the MS/MSD spike recovery was less than 75 percent.
16. The reported value was qualified because the MS/MSD spike recovery was greater than 125 percent.

17. The reported value was qualified as estimated (J/UJ) but the bias is uncertain due to both high and low MS recoveries.
18. The reported values were qualified because the laboratory duplicate exceeded 35 percent RPD for results greater than 5X the reporting limit or the absolute difference exceeded two times the reporting limit for sample result less than 5 times the reporting limit.
19. The reported value was qualified because the field duplicate exceeded 35 percent RPD for results greater than 5X the reporting limit or the absolute difference exceeded two times the reporting limit for sample result less than 5 times the reporting limit.
20. The reported value was qualified because the LCS recovery was less than 80 percent.
21. The reported value was qualified because the sample moisture content was greater than 50 percent.
22. The reported value was rejected because the field duplicate absolute difference was greater than 4 times the RL or the RPD was greater than 120%.
23. The reported result was greater than the MDL but less than the RL and qualified (J) as estimated by the laboratory.
24. The field duplicate absolute difference exceeded two times the reporting limit for sample result less than 5 times the reporting limit.
25. The reported value was qualified because the LCS recovery was greater than 120 percent.
26. The result was qualified because of negative instrument drift.

Aqueous Target Analyte Summary Hit List (Metals)

Site Name PPG Garfield Avenue Supplemental Remedial Investigation (GARIS) Forrest Street
Sampling Date March 4, 2014
Lab Name/ID Accutest, Dayton, NJ
SDG No JB61029A
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID NA

Field Sample ID	Lab Sample ID	Analyte	Method Blank (ug/L)	Laboratory Sample Result (ug/L)	Validation Sample Result (ug/L)	RL (ug/L)	Quality Assurance Decision	NJDEP Validation Footnote
FS10GW-10.0-14.0	JB61029-7A	CHROMIUM	U	768	768	10		
FS10GW-20.0-24.0	JB61029-13A	CHROMIUM	U	1380	1380	50		
FS10GW-30.0-34.0	JB61029-16A	CHROMIUM	U	577	577	10		
FS10GW-40.0-44.0	JB61029-23A	CHROMIUM	U	1450	1450	10		

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

NJDEP Laboratory Footnote

1. The value reported is less than or equal to 3x the value in the method blank. It is the policy of NJDEP-DPFSR to negate the reported value due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
2. The value reported is greater than three (3) but less than ten (10) times the value in the method blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to the method blank contamination. The "B" qualifier alerts the end-user to the presence of this analyte in the method blank.
3. The value reported is less than or equal to 3x the value in the trip/field blank. It is the policy of NJDEP-DPFSR to negate the reported value as due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
4. The value reported is greater than 3x but less than ten (10) the value in the trip/field blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to trip/field blank contamination.

5. The concentration reported by the laboratory is incorrectly calculated.
6. The laboratory failed to report the presence of the analyte in the sample.
7. The reported metal value was qualified because the Calibration Verification Standard was not within the recovery range (90-110 percent).
8. In the MS/MSD Sample Analysis, this analyte fell outside the control limits of 20% RPD. Therefore, the result was qualified.
9. This analyte was qualified because the laboratory performed the MS/MSD Analysis on a field blank.
10. The reported analyte was qualified because the associated Calibration Blank result was greater than the MDL.
11. The reported value was qualified because serial dilution analysis was not within QC limit of 10% D.
12. This analyte is rejected because the laboratory exceeded the holding time for digestion and analysis.
13. The laboratory subtracted the method blank from the sample result. The reviewer's calculation has added the method blank result to the reported concentration.
14. The photocopy submitted is illegible. Therefore, the QA reviewer cannot read the laboratory's reported concentration result.
15. The reported or nondetected value was qualified because the MS/MSD spike recovery was less than 75 percent.
16. The reported value was qualified because the MS/MSD spike recovery was greater than 125 percent.
17. The reported value was qualified as estimated (J/UJ) but the bias is uncertain due to both high and low MS recoveries.
18. The reported values were qualified because the laboratory duplicate exceeded 35 percent RPD for results greater than 5X the reporting limit or the absolute difference exceeded two times the reporting limit for sample result less than 5 times the reporting limit.
19. The reported value was qualified because the field duplicate exceeded 35 percent RPD for results greater than 5X the reporting limit or the absolute difference exceeded two times the reporting limit for sample result less than 5 times the reporting limit.
20. The reported value was qualified because the LCS recovery was less than 80 percent.
21. The reported value was qualified because the sample moisture content was greater than 50 percent.

22. The reported value was rejected because the field duplicate absolute difference was greater than 4 times the RL or the RPD was greater than 120%.
23. The reported result was greater than the MDL but less than the RL and qualified (J) as estimated by the laboratory.
24. The field duplicate absolute difference exceeded two times the reporting limit for sample result less than 5 times the reporting limit.
25. The reported value was qualified because the LCS recovery was greater than 120 percent.
26. The result was qualified because of negative instrument drift.

Attachment B

Data Validation Report Form

Client Name: PPG Industries	Project Number: 60154801.6001A
Site Location: PPG Garfield Avenue Supplemental Remedial Investigation (GARIS) Forrest Street Groundwater and Soil, Jersey City, NJ	Project Manager: William Spronz
Laboratory: Accutest, Dayton, NJ	Type of Validation: Full
Laboratory Job No: JB61029	Date Checked: 4/29/14
Validator: Paula DiMattei	Peer: Lisa Krowitz

ITEM	YES	NO	N/A	COMMENTS
Sample results included?	X			
Reporting Limits met project requirements?	X			
Field I.D. included?	X			
Laboratory I.D. included?	X			
Sample matrix included?	X			
Sample receipt temperature 2-6C?	X			
Signed COCs included?	X			
Date of sample collection included?	X			
Date of sample digestion included?	X			
Holding time to digestion met criteria? (Soils -30 days from collection to digestion.)	X			
Date of analysis included?	X			
Holding time to analysis met criteria? (Soils -168 hours from digestion to analysis; Aqueous - 24 hours from collection to analysis.)	X			
Method reference included?	X			
Laboratory Case Narrative included?	X			

Definitions: MDL Method Detection Limit; %R Percent Recovery; RL Reporting Limit; RPD Relative Percent Difference; RSD Relative Standard Deviation :Corr Correlation Coefficient.

ITEM	YES	NO	N/A	COMMENTS
Initial calibration documentation included in lab package?	X			
1) Blank plus 4 standards (7196A) or blank plus 3 standards (7199)	X			
2) Correlation coefficient of =0.995 (7196A) or =0.999 (7199)	X			
3) Calibrate daily or each time instrument is set up.	X			
Calibration Check Standard (CCS) for 7196A and Quality Control Sample (QCS) for 7199 Included in Lab Package?	X			
1) %R criteria met? (90 - 110%)	X			
2) Correct frequency of one per every 10 samples	X			
3) CCS and QCS from independent source and at mid-level of calibration curve	X			
Calibration Blanks	X			
1) Analyzed prior to initial calibration standards and after each CCS/QCS?	X			
2) Absolute value should not exceed MDL.		X		See nonconformance table below
Method Blank, Field Blanks and/or Equipment Blanks Included in Lab Package?	X			FS-FB20140304
1) Method blank analyzed with each preparation batch?	X			
2) Absolute value should not exceed MDL.		X		See nonconformance table below
Eh and pH Data	X			
1) Eh and pH data was included and plotted for all samples?	X			
Soluble Matrix Spike Data Included in Lab Package?	X			
1) Soluble Matrix %R criteria met? (75-125%R).	X			
2) Was the spike concentration 40 mg/Kg or twice the sample concentration?	X			
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	X			
Insoluble Matrix Spike Data Included in Lab Package?	X			
1) Insoluble Matrix %R criteria met? (75-125%R).	X			
2) Was the spike concentration around 400 to 800 mg/Kg?	X			
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	X			

ITEM	YES	NO	N/A	COMMENTS
Post Digestion Spike	X			
1) Post Digestion Spike %R criteria met? (85-115%R).	X			
2) Was the spike concentration 40 mg/Kg or twice the sample concentration?	X			
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	X			
Sample Duplicate Data Included in Lab Package?	X			
1) RPD criteria met? (RPD ≤20%) if both results are ≤4x RL or absolute difference ≤RL if either or both results are <4xRL.		X		See nonconformance table below
2) Was a sample duplicate analyzed at the frequency of 1 per batch or 20 samples?	X			
Was a Laboratory Control Sample (LCS) Included in Lab Package?	X			
1) %R criteria met? (80-120%R).	X			
2) Was an LCS analyzed at the frequency of 1/batch or 20 samples?	X			
Were any Field Duplicate samples submitted with this SDG?	X			
1) Were Field duplicate RPD criteria met? (RPD≤20% for both sample results >4xRL or absolute difference ≤ RL if either or both results are <4xRL.		X		See nonconformance table below
Were all sample quantitation and reporting requirements met?	X			
1) Were all solid samples reported with percent solids > 50% ?	X			
2) Were any samples analyzed or reported with dilutions?		X		
Miscellaneous Items	X			
1) For soils by 7196A, was the pH within a range of 7.0-8.0?	X			
2) For soils by 7199, was the pH within a range of 9.0-9.5?			X	
3) For aqueous by 7196A, was the pH with a range of 1.5-2.5?	X			
4) For soils (3060A), was the digestion temperature 90-95C for at least 60 minutes?	X			
5) For 7199, was each sample injected twice and was the RPD =20?			X	

Laboratory Blanks

Blank ID	Analyte	Result	QL	Units	Associated Samples
GN547-MB1	CHROMIUM (HEXAVALENT)	-0.003	0.010	mg/L	All aqueous samples
GP78427-MP1	CHROMIUM (HEXAVALENT)	-0.128	0.40	mg/kg	All soil samples

Lab Duplicates

Sample ID	Duplicate ID	Analyte	Sample Result	Qual	Duplicate Result	Qual	QL	Units	RPD
FS10-0.3-0.8	ACTDJB61029201403111820011	CHROMIUM (HEXAVALENT)	2.3		1.8		0.42	mg/kg	24.4

Field Duplicates

Sample ID	Duplicate ID	Analyte	Sample Result	Qual	Duplicate Result	Qual	QL	Units	RPD
FS10-2.0-2.5	FS10-2.0-2.5X	CHROMIUM (HEXAVALENT)	21		26.3		0.48	mg/kg	22.4

SDG#: JB61029
Batch: GN532
 Cr+6 ICAL 03/10/14
 Soil
 (p. 83 of data pkg)

x - concentration	y - response
0	0
0.01	0.012
0.05	0.044
0.1	0.095
0.3	0.263
0.5	0.445
0.8	0.697
1	0.878

(p. 83 of data pkg)

AECOM Calculated Intercept	0.0028	OK	Reported intercept	0.0028
AECOM Slope	0.8738	OK	Reported Slope	0.8738
AECOM Calculated r	0.99994	OK	Reported r	0.99994

GP78427-B1
p.83

LCS calculation
 Background Absorbance 0
 Total absorbance 0.835
 Total absorbance - background 0.835
 Instrument Concentration 0.952
 Sample weight (mg/kg) 0.0025
 Final Volume (L) 0.1
 Dilution Factor 1

AECOM Calculated LCS Result (mg/Kg)	38.1	OK	Reported Result (mg/Kg)	38.1
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%R = Found/True*100 **p. 59**

True Value (mg/kg) 40

AECOM Calculated %R	95.2	OK rounding	Reported %R	95.3
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MS calculation **JB61029-1 [FS10-0.3-0.8]p.83**

Background reading 0
 Total absorbance 0.31
 Total absorbance - background 0.31
 Instrument Concentration 0.3516
 Sample weight (mg/kg) 0.00248
 Final Volume (L) 0.1
 Percent solids 0.954
 Dilution Factor 50

AECOM Calculated MS Result (mg/Kg)	743	OK	Reported Result (mg/Kg)	743
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%R = Found/True*100 **JB61029-1 [FS10-0.3-0.8]p.61**

True Value (mg/kg) 789

Native concentration (mg/Kg) 2.3

AECOM%R	93.9	OK	Reported %R	93.9
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Percent Solids **JB61029-1 [FS10-0.3-0.8]p.62**

Empty dish weight= 23.05

Wet weight= 30.03

Dry weight= 29.71

AECOM%solids =	95.4	OK	reported %solids=	95.4
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Reporting Limit**JB61029-1 [FS10-0.3-0.8]p.13**

Low Standard	0.01		
Initial weight (mg/kg)	0.00242		
Final volume (L)	0.1		
Percent solids	0.954		
Dilution Factor	1		
Reporting Limit	0.43	OK rounding	Reported RL (mg/Kg)= 0.42

Sample Calculations**JB61029-1 [FS10-0.3-0.8]p.13**

Background reading	0.008		
Total absorbance	0.057		
Total absorbance - background	0.049		
Instrument Response	0.053		
Sample weight (mg/kg)	0.00242		
Final Volume (L)	0.1		
Percent solids	0.954		
Dilution Factor	1		
AECOM Calculated Result (mg/Kg)	2.3	OK	Reported Result (mg/Kg) 2.3

Client Name: PPG Industries	Project Number: 60154801.6001A
Site Location: PPG Garfield Avenue Supplemental Remedial Investigation (GARIS) Forrest Street Groundwater and Soil, Jersey City, NJ	Project Manager: William Spronz
Laboratory: Accutest, Dayton, NJ	Type of Validation: Limited
Laboratory Job No: JB61029A	Date Checked: 4/29/14
Validator: Paula DiMattei	Peer: Lisa Krowitz

ITEM	YES	NO	N/A	COMMENTS
Sample results included?	X			
Reporting Limits met project requirements?	X			
Field I.D. included?	X			
Laboratory I.D. included?	X			
Sample matrix included?	X			
Sample receipt temperature 2-6C?	X			
Signed COCs included?	X			
Date of sample collection included?	X			
Date of sample digestion included?	X			
Date of analysis included?	X			
Holding time met QC criteria? (Metals -180 days from sample collection; Mercury - 28 days from sample collection. If HT exceeded by 10 days R all results.	X			
Method reference included?	X			
Laboratory Case Narrative included?	X			

Definitions: MDL Method Detection Limit; %R Percent Recovery; RL Reporting Limit; RPD Relative Percent Difference; RSD Relative Standard Deviation ;Corr Correlation Coefficient.

ITEM	YES	NO	N/A	COMMENTS
Sample dilutions?	X			
Initial calibration documentation included in lab package?			X	NA for a Limited review
1) Calibrate daily or each time instrument is set up.			X	
2) ICP (6010) -Blank plus 1 standard? If no, reject (R) data.			X	
3) Hg (7470/7471) -Blank plus 5 standards? If no, reject (R) data.			X	
Initial Calibration Verification Standard (ICV) for ICP (6010) and Initial Calibration Check Standard (ICCS) for Hg (7470/7471) included in lab package?			X	
1) Analyzed immediately after initial calibration? If no, reject (R) data.			X	
2) %R criteria met? (90-110%). If no, J positive results for affected analyte(s) if %R between 80-89% and 111-120% and indicate bias; UJ non-detect results for affected analyte(s) if %R between 80-89% , and R all data for affected analyte(s) if %R 120%.			X	
3) Spot check ICV/ICCS results for several analytes.			X	
Continuing Calibration Verification Standard (CCV) for ICP (6010) and Calibration Check Standard (CCS) for Hg (7470/7471) included in Lab Package?			X	
1) Analyzed immediately after each ICV/ICC/CB and after every 10 samples? If no, reject (R) data.			X	
2) CCS and CCV from independent source and at mid-level of calibration curve. If no, reject (R) data.			X	
3) %R criteria met? (90-110%R). If no, J positive results for affected analyte(s) if %R between 80-89% and 111-120% and indicate bias; UJ non-detect results for affected analyte(s) if %R between 80-89% and R all data for affected analyte(s) if %R 120%.			X	
4) Spot check CCV/CCS results for several analytes.			X	
Low Calibration Standard (CRI) included in Lab Package?			X	
1) %R criteria met? - 50-150% for Co, Mn, Zn, by ICP-MS; Pb, Tl by 6010; 70-130% all others. If no, refer to ILM05.4 NJ SOP 5.A.2 for actions.			X	

ITEM	YES	NO	N/A	COMMENTS
Calibration Blanks			X	NA for a Limited review
1) Analyzed after daily calibration and after each ICV/ICC/CCV/CCS and after every 10 samples? If no, reject (R) data.			X	
2) Absolute value 10xCB result, no qualification.			X	
Method Blank Included in Lab Package?	X			
1) Method blank analyzed with each preparation batch or every SDG, or 1/20 samples? If no, reject (R) data, except no aqueous MB required for FB/EB if only soil samples were analyzed.	X			
2) Method blank analyzed 1/20 samples? If - MB 1/25, J sample results from 21-25; -MB >1/25, R sample results after 25th sample.	X			
3) MB results nondetect? If no, -sample result 3xMB but 10xMB, no qualification.		X		See nonconformance table below.
4) Negative MB result reported? If yes, -Positive sample result		X		
Field Blanks/Equipment Blanks Included in Lab Package?	X			FS-FB20140304
1) FB/EB result non-detect? If no, -sample result 3xFB/EB but 10xFB/EB, no qualification.	X			
ICP Interference Check Sample (ICS) included in Lab Package?			X	NA for a Limited review
1) Analyzed at beginning of analytical run? If no, reject (R) data.			X	
2) %R criteria met? (80-120%) If no, %R>120%, no qualification if sample result non-detect; %R between 121-150%, J positive results, biased high; %R between 50-79%, J/UJ results, biased low; %R150%, reject (R) result			X	
3) Spot check accuracy of %Rs			X	
Matrix Spike/Matrix Spike Duplicate Data Included in Lab Package?	X			
1) MS/MSD %R (75-125%R) and RPD (+20%) criteria met? - %R>125% J positive results for affected analyte(s) for all samples in the same batch/SDG, accept NDs; -%R		X		See nonconformance table below.
2) Was a sample spiked at the frequency of 1/batch or 20 samples?	X			
3) Was the MS performed on a site sample?	X			Batch QC was also provided. The batch QC was not assessed.
4) Was the MS performed on a FB/EB or TB? If yes, J all sample data.		X		

ITEM	YES	NO	N/A	COMMENTS
Post Digestion Spike			X	NA for a Limited review
1) %R criteria met? (75-125%R) - %R>125% J positive results for affected analyte(s) for all samples in the same batch/SDG, accept NDs.; - %R			X	
2) Was the spike performed on a FB/EB or TB? If yes, J all sample data.			X	
3) Was a sample spiked at the frequency of 1/batch or 20 samples?			X	
Laboratory Duplicate Data Included in Lab Package?			X	MS/MSD analyses were performed in lieu of laboratory duplicate analysis.
Aqueous - If RPD is >20% but 5x the QL, estimate (J) results >the QL. - If RPD is >100%, reject R results >= the QL.- If sample and/or duplicate is the QL, estimate (J) positive results 2x the QL, reject R non-detects and positive results			X	
Soil - If RPD is >35% but 5x the QL, estimate (J) results > the QL. - If RPD is >120%, reject results > the QL. - If sample and/or duplicate is 2x the QL, estimate (J) positive results 4x the QL, reject nondetects and positive results			X	
Was a Laboratory Control Sample (LCS) Included in Lab Package?	X			
1) LCS %R criteria met? (80-120%R). If no, J/UJ all affected analytes(s) for all samples in the same batch/SDG.	X			
2) Was an LCS analyzed at the frequency of 1/batch or 20 samples? If no, J/UJ affected analyte(s) for all samples in the same batch/SDG.	X			
Serial Dilution			X	NA for a Limited review
1) %D(25xIDL (7000) or >10xIDL (6010) and %D >10% J positive results for affected analyte(s) for all samples in the same batch/SDG, accept NDs.			X	
2) Was the frequency 1/batch or 20 samples?			X	
3) Was a site sample used?			X	
4) Was a FB/EB or TB used? If yes, J all sample data.			X	
5) Spot check accuracy of %Ds.			X	

ITEM	YES	NO	N/A	COMMENTS
Field Duplicate Data included in Lab Package?	X			FS10-2.0-2.5 and FS10-2.0-2.5X
Aqueous - If RPD is >20% but 5x the QL, estimate (J) results > the QL. - If RPD is >100%, reject R results >= the QL. - If sample and/or duplicate is the QL, estimate (J) positive results 2x the QL, reject R non-detects and positive results			X	
Soil - If RPD is >35% but 5x the QL, estimate (J) results > the QL. - If RPD is >120%, reject results > the QL. - If sample and/or duplicate is 2x the QL, estimate (J) positive results 4x the QL, reject nondetects and positive results	X			
Percent Solids data included in Lab Package?	X			
1) %Solids criteria (Reg 2 criteria) met? (>=50%)	X			

Laboratory Blanks

Blank ID	Analyte	Result	QL	Units	Associated Samples
MP78101-MB1	Chromium	0.20	0.99	mg/kg	All soil samples except FS10-20.0-20.5

Matrix Spikes

Sample ID	Analyte	Analysis Batch	MS % Recovery	MSD % Recovery	Lower Limit	Upper Limit	RPD	RPD Limit
FS10-0.3-0.8	ANTIMONY	MP78101	53.9	52.8	75	125	ok	20
FS10-0.3-0.8	CHROMIUM	MP78101	140.3	ok	75	125	ok	20
FS10-0.3-0.8	VANADIUM	MP78101	ok	ok	75	125	23.4	20

Data Validation Report

Project:	PPG Garfield Avenue Supplemental Remedial Investigation (GARIS) Forrest Street Groundwater and Soil	
Laboratory:	Accutest, Dayton, NJ	
Laboratory Job No.:	JB61122, JB61122A and JB61122R	
Analysis/Method:	Hexavalent Chromium SW846 3060A/7196 Metals by ICP-AES/ SW846-6010	
Validation Level:	Full (Hexavalent Chromium) Limited (Metals)	
Site Location/Address:	Forrest Street, Jersey City, NJ	
AECOM Project No:	60154801.6001A	
Prepared by:	Paula DiMattei /AECOM	Completed on: 04/30/2014
Reviewed by:	Lisa Krowitz /AECOM	File Name: JB61122_A_R_2014-04-30_DV Report-F

Introduction

The data were reviewed in accordance with the FSP-QAPP and the following NJDEP validation Standard Operating Procedures (SOP):

- NJDEP Office of Data Quality SOP 5.A.10, Rev 3 (September 2009), SOP for Analytical Data Validation of Hexavalent Chromium - for USEPA SW-846 Method 3060A, USEPA SW-846 Method 7196A and USEPA SW-846 Method 7199;
- NJDEP Office of Data Quality SOP 5.A.16, Rev 1 (May 2002), Quality Assurance Data Validation of Analytical Deliverables for Inorganics (based on USEPA SW-846 Methods)

The results of quality control data analyzed with site samples were used to assess the overall reliability of the data. The following qualifiers were used to identify data quality issues:

- U: Indicates the analyte was not detected in the sample above the sample reporting limit.
- J: Indicates the result was an estimated value; the associated numerical value was an approximate concentration of the analyte in the sample.
- UJ: Indicates the analyte was not detected above the reporting limit and the reporting limit was approximate.
- R: The sample result was rejected due to serious deficiencies; the presence or absence of the analyte could not be confirmed.
- RA: The sample result was rejected but is still considered usable.

Sample Information

The samples listed below were collected by AECOM on March 5, 2014 as part of the PPG Garfield Avenue Supplemental Remedial Investigation (GARIS) Forrest Street Groundwater and Soil sampling at the PPG Forrest Street, Jersey City, NJ. Only the samples and parameters listed below were validated.

Field ID	Laboratory ID	Matrix	Fraction
FS9-0.3-0.8	JB61122-1	Soil	Hexavalent Chromium
FS9-0.3-0.8	JB61122-1A	Soil	Metals
FS9-0.3-0.8	JB61122-1R	Soil	Hexavalent Chromium
FS9-10.0-10.5	JB61122-8	Soil	Hexavalent Chromium
FS9-10.0-10.5	JB61122-8A	Soil	Metals
FS9-10.0-10.5	JB61122-8R	Soil	Hexavalent Chromium
FS9-12.0-12.5	JB61122-9	Soil	Hexavalent Chromium
FS9-12.0-12.5	JB61122-9A	Soil	Metals
FS9-12.0-12.5	JB61122-9R	Soil	Hexavalent Chromium
FS9-16.0-16.5	JB61122-10	Soil	Hexavalent Chromium
FS9-16.0-16.5	JB61122-10A	Soil	Metals
FS9-16.0-16.5	JB61122-10R	Soil	Hexavalent Chromium
FS9-18.0-18.5	JB61122-11	Soil	Hexavalent Chromium
FS9-18.0-18.5	JB61122-11A	Soil	Metals
FS9-18.0-18.5	JB61122-11R	Soil	Hexavalent Chromium
FS9-2.0-2.5	JB61122-2	Soil	Hexavalent Chromium
FS9-2.0-2.5	JB61122-2A	Soil	Metals
FS9-2.0-2.5	JB61122-2R	Soil	Hexavalent Chromium
FS9-2.0-2.5X (Field Duplicate of FS9-2.0-2.5)	JB61122-3	Soil	Hexavalent Chromium
FS9-2.0-2.5X (Field Duplicate of FS9-2.0-2.5)	JB61122-3A	Soil	Metals
FS9-2.0-2.5X (Field Duplicate of FS9-2.0-2.5)	JB61122-3R	Soil	Hexavalent Chromium
FS9-20.0-20.5	JB61122-13	Soil	Hexavalent Chromium
FS9-20.0-20.5	JB61122-13A	Soil	Metals
FS9-20.0-20.5	JB61122-13R	Soil	Hexavalent Chromium
FS9-22.0-22.5	JB61122-14	Soil	Hexavalent Chromium
FS9-22.0-22.5	JB61122-14A	Soil	Metals
FS9-24.0-24.5	JB61122-15	Soil	Hexavalent Chromium
FS9-24.0-24.5	JB61122-15A	Soil	Hexavalent Chromium
FS9-26.0-26.5	JB61122-16	Soil	Metals
FS9-26.0-26.5	JB61122-16A	Soil	Hexavalent Chromium
FS9-28.0-28.5	JB61122-18	Soil	Hexavalent Chromium
FS9-28.0-28.5	JB61122-18A	Soil	Metals
FS9-30.0-30.5	JB61122-19	Soil	Hexavalent Chromium

Field ID	Laboratory ID	Matrix	Fraction
FS9-30.0-30.5	JB61122-19A	Soil	Hexavalent Chromium
FS9-32.0-32.5	JB61122-20	Soil	Metals
FS9-32.0-32.5	JB61122-20A	Soil	Hexavalent Chromium
FS9-34.0-34.5	JB61122-21	Soil	Hexavalent Chromium
FS9-34.0-34.5	JB61122-21A	Soil	Metals
FS9-36.0-36.5	JB61122-22	Soil	Hexavalent Chromium
FS9-36.0-36.5	JB61122-22A	Soil	Hexavalent Chromium
FS9-38.0-38.5	JB61122-23	Soil	Metals
FS9-38.0-38.5	JB61122-23A	Soil	Hexavalent Chromium
FS9-4.0-4.5	JB61122-4	Soil	Hexavalent Chromium
FS9-4.0-4.5	JB61122-4A	Soil	Metals
FS9-4.0-4.5	JB61122-4R	Soil	Hexavalent Chromium
FS9-6.0-6.5	JB61122-5	Soil	Hexavalent Chromium
FS9-6.0-6.5	JB61122-5A	Soil	Metals
FS9-6.0-6.5	JB61122-5R	Soil	Hexavalent Chromium
FS9-8.0-8.5	JB61122-6	Soil	Hexavalent Chromium
FS9-8.0-8.5	JB61122-6A	Soil	Metals
FS9-8.0-8.5	JB61122-6R	Soil	Hexavalent Chromium
FS9GW-10.0-14.0	JB61122-7	Ground Water	Hexavalent Chromium
FS9GW-10.0-14.0	JB61122-7A	Ground Water	Metals
FS9GW-20.0-24.0	JB61122-12	Ground Water	Hexavalent Chromium
FS9GW-20.0-24.0	JB61122-12A	Ground Water	Metals
FS9GW-30.0-34.0	JB61122-17	Ground Water	Hexavalent Chromium
FS9GW-30.0-34.0	JB61122-17A	Ground Water	Metals
FS9GW-40.0-44.0	JB61122-24	Ground Water	Hexavalent Chromium
FS9GW-40.0-44.0	JB61122-24A	Ground Water	Metals
FS-FB20140305 (Equipment Blank)	JB61122-25	Aqueous	Hexavalent Chromium
FS-FB20140305 (Equipment Blank)	JB61122-25A	Aqueous	Metals
FSTP2-4.3-4.8	JB61122-26	Soil	Hexavalent Chromium
FSTP2-4.3-4.8	JB61122-26A	Soil	Metals

The samples were collected following the procedures detailed in the Remedial Investigation Work Plan - Soil for Non-Residential Chromate Chemical Production Waste Sites 114, 132, 133, 135, 137, 143, and 186, Jersey City, New Jersey, or applicable proposal or work plan, and the Field Sampling Plan/Quality Assurance Project Plan for Non-Residential and Residential Chromium Sites Hudson County, New Jersey (December 2011).

General Comments

The data package was complete. Quality control (QC) issues identified during validation are discussed below. Refer to the Target Analyte Summary Hit(s) in Attachment A for a listing of all detected results, qualified results, and associated qualifications, where applicable. The nonconformances for each section discussed below are presented in Attachment B.

Hexavalent Chromium

Laboratory Blanks/Equipment Blanks

Method Blank

Negative drift for hexavalent chromium was detected in the continuing calibration blanks (CCBs) and the method blanks, at comparable amounts, impacting the initial analysis results for the soil samples in this SDG. The positive and nondetect hexavalent chromium results reported from the initial analysis of the soil samples were qualified as estimated (J/UJ).

MS Results

There were two matrix spike (MS) samples associated with the soil samples in this SDG that were used for supporting data quality recommendations: FS9-0.3-0.8 (JB61122-1) and FS9-38.0-38.5 (JB61122-23). Sample FS9GW-10.0-14.0 (JB61122-7) is the MS sample associated with the groundwater samples in this SDG.

MS sample FS9-0.3-0.8

Sample FS9-0.3-0.8 was selected for soil matrix spike analysis and used for supporting data quality recommendations. The soluble and insoluble matrix spike (MS) recoveries from the initial batch were 69.6% and 90.4%, respectively. The soluble MS recovery did not meet the quality control (QC) criteria of 75-125%R. The post digestion spike (PDS) recovery was 96.4% which met the PDS criteria of 85-115%.

Based on poor MS recoveries, less than 75%R, the MS and associated samples were reanalyzed using Method 7196. The soluble and insoluble matrix spike recoveries from the re-analysis were 76.2% and 94.9%, respectively, which met the QC criteria of 75-125%R. The PDS result for the re-analysis batch was recovered at 93.2%, which met the PDS criteria of 85-115%.

Since the soluble MS recovery was outside the acceptable QC limit of 75-125% in the initial analysis, additional parameters were analyzed to determine if possible matrix interferences could be the cause for the poor matrix spike recoveries. All the soil samples were tested for pH and oxidation reduction potential (ORP) and plotted on an Eh/pH phase diagram chart. From this chart, the source sample for the matrix spike analysis was plotted below the phase change line, indicating reducing potential within the sample matrix, incapable of supporting hexavalent chromium. Analyses for ferrous iron, sulfide screen, and total organic carbon (TOC) were performed on the MS source sample to confirm the oxidizing/reducing potential within the sample matrix. The sulfide screen was reported as nondetect, indicating no reducing agents within the sample matrix; however, the ferrous iron (0.77%) and the TOC results (42,300 mg/kg) were positive, indicating potential reducing agents within the sample matrix.

Since the MS recoveries from the initial analysis did not meet the MS QC requirements, but were greater than 50%, the highest detected hexavalent chromium result or nondetect with the lowest reporting limit (RL) was reported for each soil sample in this SDG, except for sample FS9-38.0-38.5. No data qualification was required on the basis of spike recoveries since the MS recoveries in the reanalysis met the QC acceptance criteria.

MS sample FS9-38.0-38.5

Sample FS9-38.0-38.5 was selected for soil matrix spike analysis and used for supporting data quality recommendations. The soluble and insoluble MS recoveries were 95.0% and 93.9%, respectively; which met the QC criteria of 75-125%. The PDS recovery was 97.2%, which met the PDS criteria of 85-115%. No data qualification was required on the basis of spike recoveries.

MS sample FS9GW-10.0-14.0

Sample FS9GW-10.0-14.0 was selected for the groundwater matrix spike analysis and used for supporting data quality recommendations. The MS recovery was 86.7%, which met the QC criteria of 85-115%. No data qualification was required on the basis of spike recoveries.

Laboratory Duplicate Precision

Samples FS9-38.0-38.5 (JB61122-23) and FS9-0.3-0.8 (JB61122-1) were selected by the laboratory to demonstrate laboratory precision capabilities.

For sample FS9-38.0-38.5, the laboratory duplicate precision criteria were met.

For sample FS9-0.3-0.8, both the sample and duplicate results were less than 4 times the RL. The absolute difference was greater than the absolute difference criteria of less than or equal to the RL in the initial analysis. No actions were taken since the laboratory precision criteria were met in the reanalysis of sample FS9-0.3-0.8.

Sample Results

Reported results (flagged B by the laboratory) that were less than the RL, but greater than or equal to the method detection limit (MDL), are approximate values and have been qualified as estimated (J).

Metals

Laboratory Blanks/Equipment Blanks

Method Blank

Nickel was detected in the method blank (MP78116-MB1) associated with some of the soil samples in this SDG, at a concentration above the MDL, but below the RL. Since the results for nickel in the associated soil samples were greater than ten times the amount detected in the method blank, no qualifications were required.

Antimony was detected in the method blank (MP78120-MB1) associated with the aqueous equipment blank in this SDG, at a concentration above the MDL, but below the RL. Since antimony was not detected in the equipment blank FS-FB20140305, no qualifications were required.

Negative instrument drift for thallium was detected in the method blank associated with the equipment blank FS-FB20140305 in this SDG. The nondetect result for thallium in this equipment blank was qualified as estimated (UJ) with a potential low bias.

MS Results

There were two matrix spike samples, FS9-0.3-0.8 (JB61122-1A) and FS9-38.0-38.5 (JB61122-23A) associated with the Method 6010 analysis of the soil samples in this SDG.

For the MS analysis on sample FS9-0.3-0.8, the recoveries of antimony did not meet the QC criteria of 75-125%. The positive and nondetect results for antimony in the associated soil samples were qualified as estimated (J/UJ) with a potential low bias.

For the MS analysis on sample FS9-38.0-38.5, the recoveries of antimony did not meet the QC criteria of 75-125%. The positive and nondetect results for antimony in the associated soil samples were qualified as estimated (J/UJ) with a potential low bias.

Sample Results

Reported results (flagged B by the laboratory) that were less than the RL, but greater than or equal to the MDL are approximate values that have been qualified as estimated (J).

Data Quality and Usability

In general, these data appear to be valid and may be used for decision-making purposes. No data were rejected. Qualified results, if applicable, are presented in Attachments A and B.

The results for hexavalent chromium in select soil samples qualified for negative instrument drift are usable as estimated results with the potential for low bias.

The hexavalent chromium aqueous results in this SDG are usable as estimated values with the potential for low bias due to low soluble MS recoveries.

The thallium result for the equipment blank FS-FB20140305 is usable as an estimated nondetect with the potential low bias due to negative instrument drift.

Sample results for antimony qualified due to low MS recoveries are usable as estimated values with the potential for low bias.

Sample results reported between the MDL and RL are usable as estimated values with an unknown directional bias.

ATTACHMENTS

Attachment A: Target Analyte Summary Hitlist(s)

Attachment B: Data Validation Report Form

Attachment A

Target Analyte Summary Hitlist(s)

Soil Target Analyte Summary Hit List (Hexavalent Chromium)

Site Name PPG Garfield Avenue Supplemental Remedial Investigation (GARIS) Forrest Street
Sampling Date March 5, 2014
Lab Name/ID Accutest, Dayton, NJ
SDG No JB61122 and JB61122R
Sample Matrix Soil
Trip Blank ID NA
Field Blank ID FS-FB20140305

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
FS9-18.0-18.5	JB61122-11	CHROMIUM (HEXAVALENT)	-0.128	1.7	1.7	0.45	Qualify	18,43
FS9-30.0-30.5	JB61122-19	CHROMIUM (HEXAVALENT)	-0.128	0.30B	0.30	0.51	Qualify	18,31,43
FS9-32.0-32.5	JB61122-20	CHROMIUM (HEXAVALENT)	-0.128	0.95	0.95	0.47	Qualify	18,43
FS9-38.0-38.5	JB61122-23	CHROMIUM (HEXAVALENT)	-0.128	0.17B	0.17	0.49	Qualify	18,31,43
FSTP2-4.3-4.8	JB61122-26	CHROMIUM (HEXAVALENT)	-0.128	0.53	0.53	0.42	Qualify	18,43
FS9-0.3-0.8	JB61122-1R	CHROMIUM (HEXAVALENT)	U	0.70	0.70	0.43	Qualify	18
FS9-10.0-10.5	JB61122-8R	CHROMIUM (HEXAVALENT)	U	1.1	1.1	0.48	Qualify	18
FS9-12.0-12.5	JB61122-9R	CHROMIUM (HEXAVALENT)	U	1.6	1.6	0.50	Qualify	18
FS9-16.0-16.5	JB61122-10R	CHROMIUM (HEXAVALENT)	U	1.4	1.4	0.45	Qualify	18
FS9-2.0-2.5	JB61122-2R	CHROMIUM (HEXAVALENT)	U	32.3	32.3	0.47	Qualify	18
FS9-2.0-2.5X	JB61122-3R	CHROMIUM (HEXAVALENT)	U	37.5	37.5	0.48	Qualify	18
FS9-20.0-20.5	JB61122-13R	CHROMIUM (HEXAVALENT)	U	0.82	0.82	0.46	Qualify	18
FS9-4.0-4.5	JB61122-4R	CHROMIUM (HEXAVALENT)	U	0.23B	0.23	0.46	Qualify	18,31
FS9-6.0-6.5	JB61122-5R	CHROMIUM (HEXAVALENT)	U	0.57	0.57	0.54	Qualify	18
FS9-8.0-8.5	JB61122-6R	CHROMIUM (HEXAVALENT)	U	1.0	1.0	0.53	Qualify	18
FS9-22.0-22.5	JB61122-14	CHROMIUM (HEXAVALENT)	U	U	U	0.47	Qualify	18,43
FS9-24.0-24.5	JB61122-15	CHROMIUM (HEXAVALENT)	U	U	U	0.52	Qualify	18,43
FS9-26.0-26.5	JB61122-16	CHROMIUM (HEXAVALENT)	U	U	U	0.49	Qualify	18,43

FS9-28.0-28.5	JB61122-18	CHROMIUM (HEXAVALENT)	U	U	U	0.47	Qualify	18,43
FS9-34.0-34.5	JB61122-21	CHROMIUM (HEXAVALENT)	U	U	U	0.49	Qualify	18,43
FS9-36.0-36.5	JB61122-22	CHROMIUM (HEXAVALENT)	U	U	U	0.50	Qualify	18,43

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

NJDEP Laboratory Footnote

1. The value reported is less than or equal to 3x the value in the preparation/reagent blank. It is the policy of NJDEP-DPF SR to negate the reported value due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
2. The value reported is greater than three (3) times but less than ten (10) times the value in the preparation/reagent blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to the preparation/reagent blank contamination. The "B" qualifier alerts the end-user to the presence of this analyte in the preparation/reagent blank.
3. The value reported is less than or equal to three (3) times the value in the trip/field blank. It is the policy of NJDEP-DPF SR to negate the reported value as due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
4. The value reported is greater than three (3) times but less than ten (10) times the value in the trip/field blanks and is considered "real". However, the reported value must be quantitatively qualified "J" due to trip/field blank contamination.
5. The concentration reported by the laboratory is incorrectly calculated.
6. The laboratory failed to report the presence of the analyte in the sample.
7. The reported Hexavalent Chromium value was qualified because the Calibration Check Standard was not within the recovery range (90-110 percent).
8. In the Duplicate Sample Analysis, Hexavalent Chromium fell outside the control limits of ≤ 20 percent for sample results $> 4xRL$ or $+ RL$ for sample results $< 4xRL$. Therefore, the result was qualified.
9. This analyte was rejected because the laboratory performed the Duplicate Analysis on a field blank.

10. The reported value was qualified because the PVS recovery was greater than 115 percent.
11. The reported value was qualified because the PVS recovery was less than 85 percent.
12. The non-detected value was qualified (UJ) because the PVS recovery was less than 85 percent. The possibility of a false negative exists.
13. The reported analyte was qualified because the associated Calibration Blank result was greater than the MDL.
14. The laboratory made a transcription error. No hits were found in the raw data.
15. This analyte is qualified or rejected because the laboratory exceeded the holding time for digestion and/or analysis.
16. The laboratory subtracted the preparation/reagent blank from the sample result. The Reviewer's calculation puts the preparation/reagent blank back into the result.
17. The photocopy is unreadable. Therefore, the QA reviewer cannot read the laboratory's reported concentration result.
18. The reported value was qualified because the predigestion spike recovery was less than 75 %, but greater than 50%.
19. The reported value was qualified because the predigestion spike recovery was greater than 125 percent.
20. The non-detected value was qualified (UJ) because the redigestion spike recovery was less than 75 percent. The possibility of a false negative exists.
21. The reported result was qualified or rejected because the laboratory did not record the pH value(s) of the sample in a laboratory notebook.
22. The reported value was qualified (J/UJ) because the sample moisture content exceeded 50 percent.
23. The sample result was rejected because the soluble and insoluble matrix spike recoveries were less than 50%.
24. The detected sample result was qualified (J) because the incorrect spike concentration was used.
25. The reported sample results were rejected because the predigestion spike recovery was greater than 150 percent.

26. The reported sample results were rejected because the redigestion spike recovery was greater than 150 percent.
27. The reported value was qualified (J) because the redigestion spike recovery was less than 75 percent.
28. The reported value was qualified (J/UJ) because the sample digestion temperature was less than 90C.
29. In the Field Duplicate Sample Analysis, Hexavalent Chromium fell outside the control limits of $\leq 20\%$ for sample results $> 4xRL$ or $+ RL$ for sample results $< 4xRL$. Therefore, the result was qualified.
30. The reported value was qualified as estimated (J/UJ) but the bias is uncertain due to both high and low MS recoveries.
31. The reported result was greater than the MDL but less than the RL and qualified (J) as estimated by the laboratory.
32. The reported value was qualified because the sample replicate precision criterion of $\leq 20\%$ for method 7199 was exceeded.
33. The reported value was qualified (J/UJ) because the laboratory control sample (LCS) recovery was less than 80%.
34. The reported value was qualified (J) because the laboratory control sample (LCS) recovery was greater than 120%.
35. The reported result was qualified because the matrix spike analysis was not performed at the proper frequency.
36. The reported result was qualified because the laboratory duplicate analysis was not performed at the proper frequency.
37. The result was qualified because the cooler temperature upon sample receipt exceeded 6C.
38. The reported value was qualified because the redigestion spike recovery was greater than 125 percent.
39. The reported result was rejected because the laboratory failed to perform the reanalysis due to insufficient sample volume.
40. The reported results was qualified because the laboratory failed to analyze an ending CCB.
41. The reported result was qualified because the laboratory failed to make the proper method specific pH adjustment.
42. The reported result was rejected because the laboratory failed to reanalyze the MS and associated sample(s) due to failed MS recoveries.

43. The result was qualified because of negative instrument drift.

Aqueous Target Analyte Summary Hit List (Hexavalent Chromium)

Site Name PPG Garfield Avenue Supplemental Remedial Investigation (GARIS) Forrest Street
Sampling Date March 5, 2014
Lab Name/ID Accutest, Dayton, NJ
SDG No JB61122 and JB61122R
Sample Matrix Groundwater
Trip Blank ID NA
Field Blank ID NA

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/L)	Laboratory Sample Result (mg/L)	Validation Sample Result (mg/L)	RL (mg/L)	Quality Assurance Decision	NJDEP Validation Footnote
FS9GW-30.0-34.0	JB61122-17	CHROMIUM (HEXAVALENT)	U	0.0034B	0.0034	0.010	Qualify	31

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

NJDEP Laboratory Footnote

- The value reported is less than or equal to 3x the value in the preparation/reagent blank. It is the policy of NJDEP-DPFSR to negate the reported value due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
- The value reported is greater than three (3) times but less than ten (10) times the value in the preparation/reagent blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to the preparation/reagent blank contamination. The "B" qualifier alerts the end-user to the presence of this analyte in the preparation/reagent blank.
- The value reported is less than or equal to three (3) times the value in the trip/field blank. It is the policy of NJDEP-DPFSR to negate the reported value as due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
- The value reported is greater than three (3) times but less than ten (10) times the value in the trip/field blanks and is considered "real". However, the reported value must be quantitatively qualified "J" due to trip/field blank contamination.
- The concentration reported by the laboratory is incorrectly calculated.

6. The laboratory failed to report the presence of the analyte in the sample.
7. The reported Hexavalent Chromium value was qualified because the Calibration Check Standard was not within the recovery range (90-110 percent).
8. In the Duplicate Sample Analysis, Hexavalent Chromium fell outside the control limits of ≤ 20 percent for sample results $> 4xRL$ or $+ RL$ for sample results $< 4xRL$. Therefore, the result was qualified.
9. This analyte was rejected because the laboratory performed the Duplicate Analysis on a field blank.
10. The reported value was qualified because the PVS recovery was greater than 115 percent.
11. The reported value was qualified because the PVS recovery was less than 85 percent.
12. The non-detected value was qualified (UJ) because the PVS recovery was less than 85 percent. The possibility of a false negative exists.
13. The reported analyte was qualified because the associated Calibration Blank result was greater than the MDL.
14. The laboratory made a transcription error. No hits were found in the raw data.
15. This analyte is qualified or rejected because the laboratory exceeded the holding time for digestion and/or analysis.
16. The laboratory subtracted the preparation/reagent blank from the sample result. The Reviewer's calculation puts the preparation/reagent blank back into the result.
17. The photocopy is unreadable. Therefore, the QA reviewer cannot read the laboratory's reported concentration result.
18. The reported value was qualified because the predigestion spike recovery was less than 75 %, but greater than 50%.
19. The reported value was qualified because the predigestion spike recovery was greater than 125 percent.
20. The non-detected value was qualified (UJ) because the redigestion spike recovery was less than 75 percent. The possibility of a false negative exists.
21. The reported result was qualified or rejected because the laboratory did not record the pH value(s) of the sample in a laboratory notebook.

22. The reported value was qualified (J/UJ) because the sample moisture content exceeded 50 percent.
23. The sample result was rejected because the soluble and insoluble matrix spike recoveries were less than 50%.
24. The detected sample result was qualified (J) because the incorrect spike concentration was used.
25. The reported sample results were rejected because the predigestion spike recovery was greater than 150 percent.
26. The reported sample results were rejected because the redigestion spike recovery was greater than 150 percent.
27. The reported value was qualified (J) because the redigestion spike recovery was less than 75 percent.
28. The reported value was qualified (J/UJ) because the sample digestion temperature was less than 90C.
29. In the Field Duplicate Sample Analysis, Hexavalent Chromium fell outside the control limits of $\leq 20\%$ for sample results $> 4xRL$ or $+ RL$ for sample results $< 4xRL$. Therefore, the result was qualified.
30. The reported value was qualified as estimated (J/UJ) but the bias is uncertain due to both high and low MS recoveries.
31. The reported result was greater than the MDL but less than the RL and qualified (J) as estimated by the laboratory.
32. The reported value was qualified because the sample replicate precision criterion of $\leq 20\%$ for method 7199 was exceeded.
33. The reported value was qualified (J/UJ) because the laboratory control sample (LCS) recovery was less than 80%.
34. The reported value was qualified (J) because the laboratory control sample (LCS) recovery was greater than 120%.
35. The reported result was qualified because the matrix spike analysis was not performed at the proper frequency.
36. The reported result was qualified because the laboratory duplicate analysis was not performed at the proper frequency.
37. The result was qualified because the cooler temperature upon sample receipt exceeded 6C.
38. The reported value was qualified because the redigestion spike recovery was greater than 125 percent.

39. The reported result was rejected because the laboratory failed to perform the reanalysis due to insufficient sample volume.
40. The reported results was qualified because the laboratory failed to analyze an ending CCB.
41. The reported result was qualified because the laboratory failed to make the proper method specific pH adjustment.
42. The reported result was rejected because the laboratory failed to reanalyze the MS and associated sample(s) due to failed MS recoveries.
43. The result was qualified because of negative instrument drift.

Soil Target Analyte Summary Hit List (Metals)

Site Name PPG Garfield Avenue Supplemental Remedial Investigation (GARIS) Forrest Street
Sampling Date March 5, 2014
Lab Name/ID Accutest, Dayton, NJ
SDG No JB61122A
Sample Matrix Soil
Trip Blank ID NA
Field Blank ID FS-FB20140305

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
FS9-0.3-0.8	JB61122-1A	ANTIMONY	U	0.67B	0.67	2.1	Qualify	15,23
FS9-0.3-0.8	JB61122-1A	CHROMIUM	U	10.5	10.5	1.1		
FS9-0.3-0.8	JB61122-1A	NICKEL	0.15	14.7	14.7	4.3		
FS9-0.3-0.8	JB61122-1A	THALLIUM	U	0.61B	0.61	1.1	Qualify	23
FS9-0.3-0.8	JB61122-1A	VANADIUM	U	44.4	44.4	5.4		
FS9-10.0-10.5	JB61122-8A	ANTIMONY	U	0.40B	0.40	2.5	Qualify	15,23
FS9-10.0-10.5	JB61122-8A	CHROMIUM	U	14.6	14.6	1.2		
FS9-10.0-10.5	JB61122-8A	NICKEL	0.15	10.9	10.9	5.0		
FS9-10.0-10.5	JB61122-8A	VANADIUM	U	24.2	24.2	6.2		
FS9-12.0-12.5	JB61122-9A	ANTIMONY	U	0.46B	0.46	2.5	Qualify	15,23
FS9-12.0-12.5	JB61122-9A	CHROMIUM	U	23.6	23.6	1.2		
FS9-12.0-12.5	JB61122-9A	NICKEL	0.15	15.4	15.4	5.0		
FS9-12.0-12.5	JB61122-9A	VANADIUM	U	26.1	26.1	6.2		
FS9-16.0-16.5	JB61122-10A	ANTIMONY	U	0.49B	0.49	2.2	Qualify	15,23
FS9-16.0-16.5	JB61122-10A	CHROMIUM	U	14.6	14.6	1.1		
FS9-16.0-16.5	JB61122-10A	NICKEL	0.15	19.8	19.8	4.5		
FS9-16.0-16.5	JB61122-10A	VANADIUM	U	26.5	26.5	5.6		
FS9-18.0-18.5	JB61122-11A	ANTIMONY	U	0.61B	0.61	2.2	Qualify	15,23

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
FS9-18.0-18.5	JB61122-11A	CHROMIUM	U	18.0	18.0	1.1		
FS9-18.0-18.5	JB61122-11A	NICKEL	0.15	14.6	14.6	4.4		
FS9-18.0-18.5	JB61122-11A	VANADIUM	U	21.1	21.1	5.5		
FS9-2.0-2.5	JB61122-2A	ANTIMONY	U	U	U	2.4	Qualify	15
FS9-2.0-2.5	JB61122-2A	CHROMIUM	U	1060	1060	1.2		
FS9-2.0-2.5	JB61122-2A	NICKEL	0.15	117	117	4.8		
FS9-2.0-2.5	JB61122-2A	THALLIUM	U	0.75B	0.75	1.2	Qualify	23
FS9-2.0-2.5	JB61122-2A	VANADIUM	U	160	160	6.0		
FS9-2.0-2.5X	JB61122-3A	ANTIMONY	U	U	U	2.3	Qualify	15
FS9-2.0-2.5X	JB61122-3A	CHROMIUM	U	883	883	1.2		
FS9-2.0-2.5X	JB61122-3A	NICKEL	0.15	106	106	4.6		
FS9-2.0-2.5X	JB61122-3A	THALLIUM	U	0.83B	0.83	1.2	Qualify	23
FS9-2.0-2.5X	JB61122-3A	VANADIUM	U	162	162	5.8		
FS9-20.0-20.5	JB61122-13A	ANTIMONY	U	0.62B	0.62	2.3	Qualify	15,23
FS9-20.0-20.5	JB61122-13A	CHROMIUM	U	17.4	17.4	1.1		
FS9-20.0-20.5	JB61122-13A	NICKEL	0.15	14.5	14.5	4.6		
FS9-20.0-20.5	JB61122-13A	VANADIUM	U	22.2	22.2	5.7		
FS9-22.0-22.5	JB61122-14A	ANTIMONY	U	U	U	2.2	Qualify	15
FS9-22.0-22.5	JB61122-14A	CHROMIUM	U	10.7	10.7	1.1		
FS9-22.0-22.5	JB61122-14A	NICKEL	0.15	6.8	6.8	4.5		
FS9-22.0-22.5	JB61122-14A	VANADIUM	U	14.3	14.3	5.6		
FS9-24.0-24.5	JB61122-15A	ANTIMONY	U	0.32B	0.32	2.7	Qualify	15,23
FS9-24.0-24.5	JB61122-15A	CHROMIUM	U	12.5	12.5	1.4		
FS9-24.0-24.5	JB61122-15A	NICKEL	0.15	10.7	10.7	5.4		
FS9-24.0-24.5	JB61122-15A	VANADIUM	U	16.7	16.7	6.8		

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
FS9-26.0-26.5	JB61122-16A	ANTIMONY	U	0.34B	0.34	2.4	Qualify	15,23
FS9-26.0-26.5	JB61122-16A	CHROMIUM	U	7.6	7.6	1.2		
FS9-26.0-26.5	JB61122-16A	NICKEL	0.15	5.1	5.1	4.7		
FS9-26.0-26.5	JB61122-16A	VANADIUM	U	12.6	12.6	5.9		
FS9-28.0-28.5	JB61122-18A	ANTIMONY	U	0.32B	0.32	2.3	Qualify	15,23
FS9-28.0-28.5	JB61122-18A	CHROMIUM	U	7.8	7.8	1.1		
FS9-28.0-28.5	JB61122-18A	NICKEL	0.15	5.5	5.5	4.6		
FS9-28.0-28.5	JB61122-18A	VANADIUM	U	12.6	12.6	5.7		
FS9-30.0-30.5	JB61122-19A	ANTIMONY	U	0.36B	0.36	2.4	Qualify	15,23
FS9-30.0-30.5	JB61122-19A	CHROMIUM	U	12.1	12.1	1.2		
FS9-30.0-30.5	JB61122-19A	NICKEL	0.15	8.9	8.9	4.8		
FS9-30.0-30.5	JB61122-19A	VANADIUM	U	15.1	15.1	6.0		
FS9-32.0-32.5	JB61122-20A	ANTIMONY	U	0.31B	0.31	2.4	Qualify	15,23
FS9-32.0-32.5	JB61122-20A	CHROMIUM	U	8.1	8.1	1.2		
FS9-32.0-32.5	JB61122-20A	NICKEL	0.15	4.6B	4.6	4.8	Qualify	23
FS9-32.0-32.5	JB61122-20A	VANADIUM	U	10.2	10.2	5.9		
FS9-34.0-34.5	JB61122-21A	ANTIMONY	U	0.57B	0.57	2.4	Qualify	15,23
FS9-34.0-34.5	JB61122-21A	CHROMIUM	U	13.7	13.7	1.2		
FS9-34.0-34.5	JB61122-21A	NICKEL	0.15	12.5	12.5	4.8		
FS9-34.0-34.5	JB61122-21A	VANADIUM	U	18.4	18.4	6.0		
FS9-36.0-36.5	JB61122-22A	ANTIMONY	U	0.42B	0.42	2.4	Qualify	15,23
FS9-36.0-36.5	JB61122-22A	CHROMIUM	U	11.2	11.2	1.2		
FS9-36.0-36.5	JB61122-22A	NICKEL	0.15	9.1	9.1	4.8		
FS9-36.0-36.5	JB61122-22A	VANADIUM	U	16.6	16.6	6.0		
FS9-38.0-38.5	JB61122-23A	ANTIMONY	U	U	U	2.4	Qualify	15

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
FS9-38.0-38.5	JB61122-23A	NICKEL	U	8.7	8.7	4.8		
FS9-38.0-38.5	JB61122-23A	THALLIUM	U	0.63B	0.63	1.2	Qualify	23
FS9-38.0-38.5	JB61122-23A	VANADIUM	U	18.6	18.6	6.0		
FS9-38.0-38.5	JB61122-23A	CHROMIUM	U	10.6	10.6	1.2		
FS9-4.0-4.5	JB61122-4A	ANTIMONY	U	0.98B	0.98	2.3	Qualify	15,23
FS9-4.0-4.5	JB61122-4A	CHROMIUM	U	8.8	8.8	1.2		
FS9-4.0-4.5	JB61122-4A	NICKEL	0.15	10.7	10.7	4.7		
FS9-4.0-4.5	JB61122-4A	VANADIUM	U	17.9	17.9	5.8		
FS9-6.0-6.5	JB61122-5A	ANTIMONY	U	1.4B	1.4	2.6	Qualify	15,23
FS9-6.0-6.5	JB61122-5A	CHROMIUM	U	20.0	20.0	1.3		
FS9-6.0-6.5	JB61122-5A	NICKEL	0.15	32.1	32.1	5.3		
FS9-6.0-6.5	JB61122-5A	VANADIUM	U	27.3	27.3	6.6		
FS9-8.0-8.5	JB61122-6A	ANTIMONY	U	0.82B	0.82	2.6	Qualify	15,23
FS9-8.0-8.5	JB61122-6A	CHROMIUM	U	15.6	15.6	1.3		
FS9-8.0-8.5	JB61122-6A	NICKEL	0.15	17.5	17.5	5.2		
FS9-8.0-8.5	JB61122-6A	VANADIUM	U	21.8	21.8	6.4		
FSTP2-4.3-4.8	JB61122-26A	ANTIMONY	U	U	U	2.1	Qualify	15
FSTP2-4.3-4.8	JB61122-26A	CHROMIUM	U	5.7	5.7	1.0		
FSTP2-4.3-4.8	JB61122-26A	NICKEL	U	9.4	9.4	4.1		
FSTP2-4.3-4.8	JB61122-26A	VANADIUM	U	88.3	88.3	5.2		

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

NJDEP Laboratory Footnote

1. The value reported is less than or equal to 3x the value in the method blank. It is the policy of NJDEP-DPFSR to negate the reported value due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
2. The value reported is greater than three (3) but less than ten (10) times the value in the method blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to the method blank contamination. The "B" qualifier alerts the end-user to the presence of this analyte in the method blank.
3. The value reported is less than or equal to 3x the value in the trip/field blank. It is the policy of NJDEP-DPFSR to negate the reported value as due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
4. The value reported is greater than 3x but less than ten (10) the value in the trip/field blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to trip/field blank contamination.
5. The concentration reported by the laboratory is incorrectly calculated.
6. The laboratory failed to report the presence of the analyte in the sample.
7. The reported metal value was qualified because the Calibration Verification Standard was not within the recovery range (90-110 percent).
8. In the MS/MSD Sample Analysis, this analyte fell outside the control limits of 20% RPD. Therefore, the result was qualified.
9. This analyte was qualified because the laboratory performed the MS/MSD Analysis on a field blank.
10. The reported analyte was qualified because the associated Calibration Blank result was greater than the MDL.
11. The reported value was qualified because serial dilution analysis was not within QC limit of 10% D.
12. This analyte is rejected because the laboratory exceeded the holding time for digestion and analysis.
13. The laboratory subtracted the method blank from the sample result. The reviewer's calculation has added the method blank result to the reported concentration.

14. The photocopy submitted is illegible. Therefore, the QA reviewer cannot read the laboratory's reported concentration result.
15. The reported or nondetected value was qualified because the MS/MSD spike recovery was less than 75 percent.
16. The reported value was qualified because the MS/MSD spike recovery was greater than 125 percent.
17. The reported value was qualified as estimated (J/UJ) but the bias is uncertain due to both high and low MS recoveries.
18. The reported values were qualified because the laboratory duplicate exceeded 35 percent RPD for results greater than 5X the reporting limit or the absolute difference exceeded two times the reporting limit for sample result less than 5 times the reporting limit.
19. The reported value was qualified because the field duplicate exceeded 35 percent RPD for results greater than 5X the reporting limit or the absolute difference exceeded two times the reporting limit for sample result less than 5 times the reporting limit.
20. The reported value was qualified because the LCS recovery was less than 80 percent.
21. The reported value was qualified because the sample moisture content was greater than 50 percent.
22. The reported value was rejected because the field duplicate absolute difference was greater than 4 times the RL or the RPD was greater than 120%.
23. The reported result was greater than the MDL but less than the RL and qualified (J) as estimated by the laboratory.
24. The field duplicate absolute difference exceeded two times the reporting limit for sample result less than 5 times the reporting limit.
25. The reported value was qualified because the LCS recovery was greater than 120 percent.
26. The result was qualified because of negative instrument drift.

Aqueous Target Analyte Summary Hit List (Metals)

Site Name PPG Garfield Avenue Supplemental Remedial Investigation (GARIS) Forrest Street
Sampling Date March 5, 2014
Lab Name/ID Accutest, Dayton, NJ
SDG No JB61122A
Sample Matrix Groundwater
Trip Blank ID NA
Field Blank ID NA

Field Sample ID	Lab Sample ID	Analyte	Method Blank (ug/L)	Laboratory Sample Result (ug/L)	Validation Sample Result (ug/L)	RL (ug/L)	Quality Assurance Decision	NJDEP Validation Footnote
FS-FB20140305	JB61122-25A	THALLIUM	-1.8	U	U	2.0	Qualify	26
FS9GW-10.0-14.0	JB61122-7A	CHROMIUM	U	1580	1580	20		
FS9GW-20.0-24.0	JB61122-12A	CHROMIUM	U	1620	1620	20		
FS9GW-30.0-34.0	JB61122-17A	CHROMIUM	U	2230	2230	20		
FS9GW-40.0-44.0	JB61122-24A	CHROMIUM	U	1960	1960	20		

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

NJDEP Laboratory Footnote

1. The value reported is less than or equal to 3x the value in the method blank. It is the policy of NJDEP-DPFSR to negate the reported value due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
2. The value reported is greater than three (3) but less than ten (10) times the value in the method blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to the method blank contamination. The "B" qualifier alerts the end-user to the presence of this analyte in the method blank.
3. The value reported is less than or equal to 3x the value in the trip/field blank. It is the policy of NJDEP-DPFSR to negate the reported value as due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.

4. The value reported is greater than 3x but less than ten (10) the value in the trip/field blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to trip/field blank contamination.
5. The concentration reported by the laboratory is incorrectly calculated.
6. The laboratory failed to report the presence of the analyte in the sample.
7. The reported metal value was qualified because the Calibration Verification Standard was not within the recovery range (90-110 percent).
8. In the MS/MSD Sample Analysis, this analyte fell outside the control limits of 20% RPD. Therefore, the result was qualified.
9. This analyte was qualified because the laboratory performed the MS/MSD Analysis on a field blank.
10. The reported analyte was qualified because the associated Calibration Blank result was greater than the MDL.
11. The reported value was qualified because serial dilution analysis was not within QC limit of 10% D.
12. This analyte is rejected because the laboratory exceeded the holding time for digestion and analysis.
13. The laboratory subtracted the method blank from the sample result. The reviewer's calculation has added the method blank result to the reported concentration.
14. The photocopy submitted is illegible. Therefore, the QA reviewer cannot read the laboratory's reported concentration result.
15. The reported or nondetected value was qualified because the MS/MSD spike recovery was less than 75 percent.
16. The reported value was qualified because the MS/MSD spike recovery was greater than 125 percent.
17. The reported value was qualified as estimated (J/UJ) but the bias is uncertain due to both high and low MS recoveries.
18. The reported values were qualified because the laboratory duplicate exceeded 35 percent RPD for results greater than 5X the reporting limit or the absolute difference exceeded two times the reporting limit for sample result less than 5 times the reporting limit.
19. The reported value was qualified because the field duplicate exceeded 35 percent RPD for results greater than 5X the reporting limit or the absolute difference exceeded two times the reporting limit for sample result less than 5 times the reporting limit.

20. The reported value was qualified because the LCS recovery was less than 80 percent.
21. The reported value was qualified because the sample moisture content was greater than 50 percent.
22. The reported value was rejected because the field duplicate absolute difference was greater than 4 times the RL or the RPD was greater than 120%.
23. The reported result was greater than the MDL but less than the RL and qualified (J) as estimated by the laboratory.
24. The field duplicate absolute difference exceeded two times the reporting limit for sample result less than 5 times the reporting limit.
25. The reported value was qualified because the LCS recovery was greater than 120 percent.
26. The result was qualified because of negative instrument drift.

Attachment B

Data Validation Report Form

Client Name: PPG Industries	Project Number: 60154801.6001A
Site Location: PPG Garfield Avenue Supplemental Remedial Investigation (GARIS) Forrest Street Groundwater and Soil, Jersey City, NJ	Project Manager: William Spronz
Laboratory: Accutest, Dayton, NJ	Type of Validation: Full
Laboratory Job No: JB61122 and JB61122R	Date Checked: 4/30/14
Validator: Paula DiMattei	Peer: Lisa Krowitz

ITEM	YES	NO	N/A	COMMENTS
Sample results included?	X			
Reporting Limits met project requirements?	X			
Field I.D. included?	X			
Laboratory I.D. included?	X			
Sample matrix included?	X			
Sample receipt temperature 2-6C?	X			
Signed COCs included?	X			
Date of sample collection included?	X			
Date of sample digestion included?	X			
Holding time to digestion met criteria? (Soils -30 days from collection to digestion.)	X			
Date of analysis included?	X			
Holding time to analysis met criteria? (Soils -168 hours from digestion to analysis; Aqueous - 24 hours from collection to analysis.)	X			
Method reference included?	X			
Laboratory Case Narrative included?	X			

Definitions: MDL Method Detection Limit; %R Percent Recovery; RL Reporting Limit; RPD Relative Percent Difference; RSD Relative Standard Deviation :Corr Correlation Coefficient.

ITEM	YES	NO	N/A	COMMENTS
Initial calibration documentation included in lab package?	X			
1) Blank plus 4 standards (7196A) or blank plus 3 standards (7199)	X			
2) Correlation coefficient of =0.995 (7196A) or =0.999 (7199)	X			
3) Calibrate daily or each time instrument is set up.	X			
Calibration Check Standard (CCS) for 7196A and Quality Control Sample (QCS) for 7199 Included in Lab Package?	X			
1) %R criteria met? (90 - 110%)	X			
2) Correct frequency of one per every 10 samples	X			
3) CCS and QCS from independent source and at mid-level of calibration curve	X			
Calibration Blanks	X			
1) Analyzed prior to initial calibration standards and after each CCS/QCS?	X			
2) Absolute value should not exceed MDL.		X		See nonconformance table below
Method Blank, Field Blanks and/or Equipment Blanks Included in Lab Package?	X			FS-FB20140305
1) Method blank analyzed with each preparation batch?	X			See nonconformance table below.
2) Absolute value should not exceed MDL.		X		
Eh and pH Data	X			
1) Eh and pH data was included and plotted for all samples?	X			
Soluble Matrix Spike Data Included in Lab Package?	X			
1) Soluble Matrix %R criteria met? (75-125%R).		X		See nonconformance table below
2) Was the spike concentration 40 mg/Kg or twice the sample concentration?	X			
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	X			
Insoluble Matrix Spike Data Included in Lab Package?	X			
1) Insoluble Matrix %R criteria met? (75-125%R).	X			
2) Was the spike concentration around 400 to 800 mg/Kg?		X		Spiked at 707 mg/kg, 1270 mg/kg, and 1170 mg/kg. No impact to data.
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	X			

ITEM	YES	NO	N/A	COMMENTS
Post Digestion Spike	X			
1) Post Digestion Spike %R criteria met? (85-115%R).	X			
2) Was the spike concentration 40 mg/Kg or twice the sample concentration?	X			
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	X			
Sample Duplicate Data Included in Lab Package?	X			
1) RPD criteria met? (RPD ≤20%) if both results are ≤4x RL or absolute difference ≤RL if either or both results are <4xRL.		X		See nonconformance table below.
2) Was a sample duplicate analyzed at the frequency of 1 per batch or 20 samples?	X			
Was a Laboratory Control Sample (LCS) Included in Lab Package?	X			
1) %R criteria met? (80-120%R).	X			
2) Was an LCS analyzed at the frequency of 1/batch or 20 samples?	X			
Were any Field Duplicate samples submitted with this SDG?	X			FS9-2.0-2.5 and FS9-2.0-2.5X
1) Were Field duplicate RPD criteria met? (RPD≤20% for both sample results >4xRL or absolute difference ≤ RL if either or both results are <4xRL.	X			
Were all sample quantitation and reporting requirements met?	X			
1) Were all solid samples reported with percent solids > 50% ?	X			
2) Were any samples analyzed or reported with dilutions?		X		
Miscellaneous Items	X			
1) For soils by 7196A, was the pH within a range of 7.0-8.0?	X			
2) For soils by 7199, was the pH within a range of 9.0-9.5?			X	
3) For aqueous by 7196A, was the pH with a range of 1.5-2.5?	X			
4) For soils (3060A), was the digestion temperature 90-95C for at least 60 minutes?	X			
5) For 7199, was each sample injected twice and was the RPD =20?			X	

Laboratory Blanks

Blank ID	Analyte	Result	QL	Units	Associated Samples
GP78431-MB1	CHROMIUM (HEXAVALENT)	-0.128	0.40	mg/kg	FS9-22.0-22.5 FS9-24.0-24.5 FS9-26.0-26.5 FS9-28.0-28.5 FS9-30.0-30.5 FS9-32.0-32.5 FS9-34.0-34.5 FS9-36.0-36.5 FS9-38.0-38.5 FSTP2-4.3-4.8
GP78429-MB1	CHROMIUM (HEXAVALENT)	-0.128	0.40	mg/kg	FS9-0.3-0.8 FS9-10.0-10.5 FS9-12.0-12.5 FS9-16.0-16.5 FS9-18.0-18.5 FS9-2.0-2.5 FS9-2.0-2.5X FS9-20.0-20.5 FS9-4.0-4.5 FS9-6.0-6.5 FS9-8.0-8.5

Matrix Spikes

Sample ID	Analyte	Analysis Batch	Matrix Spike	% Recovery	Lower Limit	Upper Limit	PDS	PDS Limit
FS9-0.3-0.8	CHROMIUM (HEXAVALENT)	GP78431/GN869	Soluble	69.6	75	125	96.4	85-115
FS9-0.3-0.8	CHROMIUM (HEXAVALENT)	GP78431/GN869	Insoluble	90.4	75	125		

Lab Duplicates

Sample ID	Duplicate ID	Analyte	Sample Result	Qual	Duplicate Result	Qual	QL	Units	RPD
FS9-0.3-0.8	ACTDJB61122201403131758017	CHROMIUM (HEXAVALENT)	0.11	B	0.61		0.43	mg/kg	138.9

SDG#: JB61122
Batch: GN869
 Cr+6 ICAL 03/10/14
 Soil
 (p. 92 of data pkg)

x - concentration	y - response
0	0
0.01	0.012
0.05	0.044
0.1	0.095
0.3	0.263
0.5	0.445
0.8	0.697
1	0.878

(p. 92 of data pkg)

AECOM Calculated Intercept	0.0028	OK	Reported intercept	0.0028
AECOM Slope	0.8738	OK	Reported Slope	0.8738
AECOM Calculated r	0.99994	OK	Reported r	0.99994

GP78431-B1
p.92

LCS calculation
 Background Absorbance 0
 Total absorbance 0.844
 Total absorbance - background 0.844
 Instrument Concentration 0.963
 Sample weight (mg/kg) 0.0025
 Final Volume (L) 0.1
 Dilution Factor 1

AECOM Calculated LCS Result (mg/Kg)	38.5	OK	Reported Result (mg/Kg)	38.5
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%R = Found/True*100 **p. 65**

True Value (mg/kg) 40

AECOM Calculated %R	96.3	OK	Reported %R	96.3
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MS calculation **JB61122-1 [FS9-0.3-0.8]p.92**

Background reading 0
 Total absorbance 0.257
 Total absorbance - background 0.257
 Instrument Concentration 0.2909
 Sample weight (mg/kg) 0.00242
 Final Volume (L) 0.1
 Percent solids 0.941
 Dilution Factor 50

AECOM Calculated MS Result (mg/Kg)	639	OK	Reported Result (mg/Kg)	639
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%R = Found/True*100 **JB61122-1 [FS9-0.3-0.8]p.67**

True Value (mg/kg) 707
 Native concentration (mg/Kg) 0.11

AECOM%R	90.3	OK rounding	Reported %R	90.4
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Percent Solids **JB61122-1 [FS9-0.3-0.8]p.68**

Empty dish weight= 23
 Wet weight= 29.11
 Dry weight= 28.75

AECOM%solids =	94.1	OK	reported %solids=	94.1
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Reporting Limit

JB61122-1 [FS9-0.3-0.8]p.14

Low Standard	0.01
Initial weight (mg/kg)	0.0024
Final volume (L)	0.1
Percent solids	0.941
Dilution Factor	1

Reporting Limit	0.44	OK rounding	Reported RL (mg/Kg)=	0.43
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Sample Calculations

JB61122-1 [FS9-0.3-0.8]p.14, 92

Background reading	0.017
Total absorbance	0.022
Total absorbance - background	0.005
Instrument Response	0.003
Sample weight (mg/kg)	0.0024
Final Volume (L)	0.1
Percent solids	0.941
Dilution Factor	1

AECOM Calculated Result (mg/Kg)	0.11	OK	Reported Result (mg/Kg)	0.11
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SDG#: JB61122R

Batch: GN1326

Cr+6 ICAL 03/17/14

Soil

(p. 106 of data pkg)

x - concentration	y - response
0	0
0.01	0.009
0.05	0.043
0.1	0.091
0.3	0.269
0.5	0.445
0.8	0.693
1	0.892

(p. 106 of data pkg)

AECOM Calculated Intercept	0.0007	OK	Reported intercept	0.0007
AECOM Slope	0.8828	OK	Reported Slope	0.8828
AECOM Calculated r	0.99982	OK	Reported r	0.99982

Sample Calculations

JB61122-1R [FS9-0.3-0.8]p.9, 106

Background reading	0.011
Total absorbance	0.026
Total absorbance - background	0.015
Instrument Response	0.016
Sample weight (mg/kg)	0.00247
Final Volume (L)	0.1
Percent solids	0.941
Dilution Factor	1

AECOM Calculated Result (mg/Kg)	0.70	OK	Reported Result (mg/Kg)	0.70
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Client Name: PPG Industries	Project Number: 60154801.6001A
Site Location: PPG Garfield Avenue Supplemental Remedial Investigation (GARIS) Forrest Street Groundwater and Soil, Jersey City, NJ	Project Manager: William Spronz
Laboratory: Accutest, Dayton, NJ	Type of Validation: Limited
Laboratory Job No: JB61122A	Date Checked: 4/30/14
Validator: Paula DiMattei	Peer: Lisa Krowitz

ITEM	YES	NO	N/A	COMMENTS
Sample results included?	X			
Reporting Limits met project requirements?	X			
Field I.D. included?	X			
Laboratory I.D. included?	X			
Sample matrix included?	X			
Sample receipt temperature 2-6C?	X			
Signed COCs included?	X			
Date of sample collection included?	X			
Date of sample digestion included?	X			
Date of analysis included?	X			
Holding time met QC criteria? (Metals -180 days from sample collection; Mercury - 28 days from sample collection. If HT exceeded by 10 days R all results.	X			
Method reference included?	X			
Laboratory Case Narrative included?	X			

Definitions: MDL Method Detection Limit; %R Percent Recovery; RL Reporting Limit; RPD Relative Percent Difference; RSD Relative Standard Deviation ;Corr Correlation Coefficient.

ITEM	YES	NO	N/A	COMMENTS
Sample dilutions?	X			
Initial calibration documentation included in lab package?			X	NA for a Limited review
1) Calibrate daily or each time instrument is set up.			X	
2) ICP (6010) -Blank plus 1 standard? If no, reject (R) data.			X	
3) Hg (7470/7471) -Blank plus 5 standards? If no, reject (R) data.			X	
Initial Calibration Verification Standard (ICV) for ICP (6010) and Initial Calibration Check Standard (ICCS) for Hg (7470/7471) included in lab package?			X	
1) Analyzed immediately after initial calibration? If no, reject (R) data.			X	
2) %R criteria met? (90-110%). If no, J positive results for affected analyte(s) if %R between 80-89% and 111-120% and indicate bias; UJ non-detect results for affected analyte(s) if %R between 80-89% , and R all data for affected analyte(s) if %R 120%.			X	
3) Spot check ICV/ICCS results for several analytes.			X	
Continuing Calibration Verification Standard (CCV) for ICP (6010) and Calibration Check Standard (CCS) for Hg (7470/7471) included in Lab Package?			X	
1) Analyzed immediately after each ICV/ICC/CB and after every 10 samples? If no, reject (R) data.			X	
2) CCS and CCV from independent source and at mid-level of calibration curve. If no, reject (R) data.			X	
3) %R criteria met? (90-110%R). If no, J positive results for affected analyte(s) if %R between 80-89% and 111-120% and indicate bias; UJ non-detect results for affected analyte(s) if %R between 80-89% and R all data for affected analyte(s) if %R 120%.			X	
4) Spot check CCV/CCS results for several analytes.			X	
Low Calibration Standard (CRI) included in Lab Package?			X	
1) %R criteria met? - 50-150% for Co, Mn, Zn, by ICP-MS; Pb, Tl by 6010; 70-130% all others. If no, refer to ILM05.4 NJ SOP 5.A.2 for actions.			X	

ITEM	YES	NO	N/A	COMMENTS
Calibration Blanks			X	NA for a Limited review
1) Analyzed after daily calibration and after each ICV/ICC/CCV/CCS and after every 10 samples? If no, reject (R) data.			X	
2) Absolute value 10xCB result, no qualification.			X	
Method Blank Included in Lab Package?	X			
1) Method blank analyzed with each preparation batch or every SDG, or 1/20 samples? If no, reject (R) data, except no aqueous MB required for FB/EB if only soil samples were analyzed.	X			
2) Method blank analyzed 1/20 samples? If - MB 1/25, J sample results from 21-25; -MB >1/25, R sample results after 25th sample.	X			
3) MB results nondetect? If no, -sample result 3xMB but 10xMB, no qualification.		X		See nonconformance table below.
4) Negative MB result reported? If yes, -Positive sample result	X			See nonconformance table below.
Field Blanks/Equipment Blanks Included in Lab Package?	X			FS-FB20140305
1) FB/EB result non-detect? If no, -sample result 3xFB/EB but 10xFB/EB, no qualification.	X			
ICP Interference Check Sample (ICS) included in Lab Package?			X	NA for a Limited review
1) Analyzed at beginning of analytical run? If no, reject (R) data.			X	
2) %R criteria met? (80-120%) If no, %R>120%, no qualification if sample result non-detect; %R between 121-150%, J positive results, biased high; %R between 50-79%, J/UJ results, biased low; %R150%, reject (R) result			X	
3) Spot check accuracy of %Rs			X	
Matrix Spike/Matrix Spike Duplicate Data Included in Lab Package?	X			Soil: FS9-0.3-0.8 and FS9-38.0-38.5 Aqueous: Batch QC (not evaluated)
1) MS/MSD %R (75-125%R) and RPD (+20%) criteria met? - %R>125% J positive results for affected analyte(s) for all samples in the same batch/SDG, accept NDs; -%R		X		See nonconformance table below.
2) Was a sample spiked at the frequency of 1/batch or 20 samples?	X			
3) Was the MS performed on a site sample?	X			
4) Was the MS performed on a FB/EB or TB? If yes, J all sample data.		X		

ITEM	YES	NO	N/A	COMMENTS
Post Digestion Spike			X	NA for a Limited review
1) %R criteria met? (75-125%R) - %R>125% J positive results for affected analyte(s) for all samples in the same batch/SDG, accept NDs.; - %R			X	
2) Was the spike performed on a FB/EB or TB? If yes, J all sample data.			X	
3) Was a sample spiked at the frequency of 1/batch or 20 samples?			X	
Laboratory Duplicate Data Included in Lab Package?		X		MS/MSD analyses were performed in lieu of laboratory duplicate analysis.
Aqueous - If RPD is >20% but 5x the QL, estimate (J) results >the QL. - If RPD is >100%, reject R results >/= the QL.- If sample and/or duplicate is the QL, estimate (J) positive results 2x the QL, reject R non-detects and positive results			X	
Soil - If RPD is >35% but 5x the QL, estimate (J) results > the QL. - If RPD is >120%, reject results > the QL. - If sample and/or duplicate is 2x the QL, estimate (J) positive results 4x the QL, reject nondetects and positive results			X	
Was a Laboratory Control Sample (LCS) Included in Lab Package?	X			
1) LCS %R criteria met? (80-120%R). If no, J/UJ all affected analytes(s) for all samples in the same batch/SDG.	X			
2) Was an LCS analyzed at the frequency of 1/batch or 20 samples? If no, J/UJ affected analyte(s) for all samples in the same batch/SDG.	X			
Serial Dilution			X	NA for a Limited review
1) %D(25xIDL (7000) or >10xIDL (6010) and %D >10% J positive results for affected analyte(s) for all samples in the same batch/SDG, accept NDs.			X	
2) Was the frequency 1/batch or 20 samples?			X	
3) Was a site sample used?			X	
4) Was a FB/EB or TB used? If yes, J all sample data.			X	
5) Spot check accuracy of %Ds.			X	

ITEM	YES	NO	N/A	COMMENTS
Field Duplicate Data included in Lab Package?	X			FS9-2.0-2.5 and FS9-2.0-2.5X
Aqueous - If RPD is >20% but 5x the QL, estimate (J) results > the QL. - If RPD is >100%, reject R results >= the QL. - If sample and/or duplicate is the QL, estimate (J) positive results 2x the QL, reject R non-detects and positive results			X	
Soil - If RPD is >35% but 5x the QL, estimate (J) results > the QL. - If RPD is >120%, reject results > the QL. - If sample and/or duplicate is 2x the QL, estimate (J) positive results 4x the QL, reject nondetects and positive results	X			
Percent Solids data included in Lab Package?	X			
1) %Solids criteria (Reg 2 criteria) met? (>=50%)	X			

Laboratory Blanks

Blank ID	Analyte	Result	QL	Units	Associated Samples
MP78120-MB1	Antimony	2.4	6.0	ug/L	FS-FB20140305
MP78120-MB1	Thallium	-1.8	2.0	ug/L	
MP78116-MB1	Nickel	0.15	4.0	mg/kg	All soils except FS9-38.0-38.5 and FSTP-4.3-4.8

Matrix Spikes

Sample ID	Analyte	Analysis Batch	MS % Recovery	MSD % Recovery	Lower Limit	Upper Limit
FS9-0.3-0.8	ANTIMONY	MP78116	50.1	51.7	75	125
FS9-38.0-38.5	ANTIMONY	MP78119	67.8	72.2	75	125

Data Validation Report

Project:	PPG Garfield Avenue Supplemental Remedial Investigation (GARIS) Forrest Street Groundwater and Soil	
Laboratory:	Accutest, Dayton, NJ	
Laboratory Job No.:	JB61462 and JB61462A	
Analysis/Method:	Hexavalent Chromium SW846 3060A/7196 Metals by ICP-AES/ SW846-6010	
Validation Level:	Full (Hexavalent chromium) Limited (Metals)	
Site Location/Address:	Forrest Street, Jersey City, NJ	
AECOM Project No:	60154801.6001A	
Prepared by:	Paula DiMattei /AECOM	Completed on: 05/18/2014
Reviewed by:	Lisa Krowitz /AECOM	File Name: JB61462_A_2014-05-18_DV Report-F

Introduction

The data were reviewed in accordance with the FSP-QAPP and the following NJDEP validation Standard Operating Procedures (SOP):

- NJDEP Office of Data Quality SOP 5.A.10, Rev 3 (September 2009), SOP for Analytical Data Validation of Hexavalent Chromium - for USEPA SW-846 Method 3060A, USEPA SW-846 Method 7196A and USEPA SW-846 Method 7199;
- NJDEP Office of Data Quality SOP 5.A.16, Rev 1 (May 2002), Quality Assurance Data Validation of Analytical Deliverables for Inorganics (based on USEPA SW-846 Methods)

The results of quality control data analyzed with site samples were used to assess the overall reliability of the data. The following qualifiers were used to identify data quality issues:

- U: Indicates the analyte was not detected in the sample above the sample reporting limit.
- J: Indicates the result was an estimated value; the associated numerical value was an approximate concentration of the analyte in the sample.
- UJ: Indicates the analyte was not detected above the reporting limit and the reporting limit was approximate.
- R: The sample result was rejected due to serious deficiencies; the presence or absence of the analyte could not be confirmed.
- RA: The sample result was rejected but is still considered usable.

Sample Information

The samples listed below were collected by AECOM on March 10, 2014 as part of the PPG Garfield Avenue Supplemental Remedial Investigation (GARIS) Forrest Street Groundwater and Soil sampling at the PPG Forrest Street, Jersey City, NJ. Only the samples and parameters listed below were validated.

Field ID	Laboratory ID	Matrix	Fraction
EF-57A-10.0-10.5	JB61462-2	Soil	Hexavalent Chromium
EF-57A-10.0-10.5	JB61462-2A	Soil	Metals
EF-57A-10.0-14.0	JB61462-1	Ground Water	Hexavalent Chromium
EF-57A-10.0-14.0	JB61462-1A	Ground Water	Metals
EF-57A-13.5-14.0	JB61462-3	Soil	Hexavalent Chromium
EF-57A-13.5-14.0	JB61462-3A	Soil	Metals
EF-57A-13.5-14.0X (Field Duplicate of EF-57A-13.5-14.0)	JB61462-4	Soil	Hexavalent Chromium
EF-57A-13.5-14.0X (Field Duplicate of EF-57A-13.5-14.0)	JB61462-4A	Soil	Metals
EF-57A-20.0-20.5	JB61462-6	Soil	Hexavalent Chromium
EF-57A-20.0-20.5	JB61462-6A	Soil	Metals
EF-57A-20.0-24.0	JB61462-5	Ground Water	Hexavalent Chromium
EF-57A-20.0-24.0	JB61462-5A	Ground Water	Metals
EF-57A-22.0-22.5	JB61462-7	Soil	Hexavalent Chromium
EF-57A-22.0-22.5	JB61462-7A	Soil	Metals
EF-57A-24.0-24.5	JB61462-8	Soil	Hexavalent Chromium
EF-57A-24.0-24.5	JB61462-8A	Soil	Metals
EF-57A-26.0-26.5	JB61462-10	Soil	Hexavalent Chromium
EF-57A-26.0-26.5	JB61462-10A	Soil	Metals
EF-57A-28.0-28.5	JB61462-11	Soil	Hexavalent Chromium
EF-57A-28.0-28.5	JB61462-11A	Soil	Metals
EF-57A-30.0-30.5	JB61462-12	Soil	Hexavalent Chromium
EF-57A-30.0-30.5	JB61462-12A	Soil	Metals
EF-57A-30.0-34.0	JB61462-9	Ground Water	Hexavalent Chromium
EF-57A-30.0-34.0	JB61462-9A	Ground Water	Metals
EF-57A-32.0-32.5	JB61462-13	Soil	Hexavalent Chromium
EF-57A-32.0-32.5	JB61462-13A	Soil	Metals
EF-57A-34.0-34.5	JB61462-14	Soil	Hexavalent Chromium
EF-57A-34.0-34.5	JB61462-14A	Soil	Metals
EF-57A-36.0-36.5	JB61462-15	Soil	Hexavalent Chromium
EF-57A-36.0-36.5	JB61462-15A	Soil	Metals
EF-57A-38.0-38.5	JB61462-16	Soil	Hexavalent Chromium
EF-57A-38.0-38.5	JB61462-16A	Soil	Metals
EF-57A-40.0-44.0	JB61462-17	Ground Water	Hexavalent Chromium

Field ID	Laboratory ID	Matrix	Fraction
EF-57A-40.0-44.0	JB61462-17A	Ground Water	Metals
EF-57A-40.0-44.0X (Field Duplicate of EF-57A-40.0-44.0)	JB61462-18	Ground Water	Hexavalent Chromium
EF-57A-40.0-44.0X (Field Duplicate of EF-57A-40.0-44.0)	JB61462-18A	Ground Water	Metals
FS-FB20140310 (Equipment Blank)	JB61462-19	Aqueous	Hexavalent Chromium
FS-FB20140310 (Equipment Blank)	JB61462-19A	Aqueous	Metals

The samples were collected following the procedures detailed in the Remedial Investigation Work Plan - Soil for Non-Residential Chromate Chemical Production Waste Sites 114, 132, 133, 135, 137, 143, and 186, Jersey City, New Jersey, or applicable proposal or work plan, and the Field Sampling Plan/Quality Assurance Project Plan for Non-Residential and Residential Chromium Sites Hudson County, New Jersey (December 2011).

General Comments

The data package was complete. Quality control (QC) issues identified during validation are discussed below. Refer to the Target Analyte Summary Hit(s) in Attachment A for a listing of all detected results, qualified results, and associated qualifications, where applicable. The nonconformances for each section discussed below are presented in Attachment B.

Hexavalent Chromium

Laboratory Blanks/Equipment Blanks

Method Blank

Negative drift for hexavalent chromium was detected in the continuing calibration blanks (CCBs) and the method blank, at comparable amounts, impacting all aqueous samples in this SDG. The positive and nondetect hexavalent chromium results for the equipment blank and groundwater samples were qualified as estimated (J/UJ).

MS Results

Sample EF-57A-20.0-24.0 (JB61462-5) was selected for the matrix spike (MS) analysis associated with the groundwater samples in this SDG and was used for supporting data quality recommendations. The MS recovery was 80.0%, which did not meet the quality control (QC) criteria of 85-115%. Additionally, the post digestion spike (PDS) recovery was 82%, which did not meet the PDS criteria of 85-115%. The positive and nondetect hexavalent chromium results for all aqueous samples were qualified as estimated (J/UJ).

Sample EF-57A-10.0-10.5 (JB61462-2) was selected for the MS analysis associated with the soil samples in this SDG and was used for supporting data quality recommendations. The soluble and insoluble MS recoveries were 95.7% and 91.8%, respectively; which met the QC criteria of 75-125%. The PDS recovery was 94.8%, which met the PDS criteria of 85-115%. No data qualification was required on the basis of spike recoveries.

Sample Results

Reported results (flagged B by the laboratory) that were less than the reporting limit (RL), but greater than or equal to the method detection limit (MDL) are approximate values and have been qualified as estimated (J).

Metals

Laboratory Blanks/Equipment Blanks

Method Blank

Thallium was detected in the method blank (MP78220-MB1) associated with the equipment blank in this SDG, at a concentration above the MDL, but below the RL. Thallium was not detected in the equipment blank FS-FB20140310; therefore, qualification of the data was not required.

MS Results

MS/MSD analysis was performed on sample EF-57A-20.0-24.0 (JB61462-5A) in association with the Method 6010 analysis of the groundwater samples in this SDG. The recovery of chromium did not meet the QC criteria of 75-125%. The positive results for chromium in all aqueous samples were qualified as estimated (J) with potential for low bias.

MS/MSD analysis was performed on sample EF-57A-10.0-10.5 (JB61462-2A) in association with the Method 6010 analysis of the soil samples in this SDG. The recovery of antimony did not meet the QC criteria of 75-125%. The positive and nondetect results for antimony in all soil samples were qualified as estimated (J/UJ) with potential for low bias.

Field Duplicate Results

The groundwater field duplicate samples in this SDG were EF-57A-40.0-44.0 and EF-57A-40.0-44.0X.

The relative percent difference (RPD) for the reported chromium field duplicate results exceeded the QC acceptance RPD of <20% and <100%; therefore, the reported chromium results in all the aqueous samples in this SDG were qualified as estimated (J).

Sample Results

Reported results (flagged B by the laboratory) that were less than the RL, but greater than or equal to the MDL are approximate values that have been qualified as estimated (J).

Data Quality and Usability

In general, these data appear to be valid and may be used for decision-making purposes. No data were rejected. Qualified results, if applicable, are presented in Attachments A and B.

The hexavalent chromium results in all aqueous samples are usable as estimated values with potential low bias due to negative instrument drift, and low MS and PDS recoveries.

The chromium results in all the aqueous samples are usable as estimated, bias low results due to low MS recoveries. In addition, the results were estimated due to poor field duplicate precision.

Soil sample results for antimony qualified due to low MS recoveries are usable as estimated values with the potential for low bias.

Sample results reported between the MDL and RL are usable as estimated values with an unknown directional bias.

ATTACHMENTS

Attachment A: Target Analyte Summary Hitlist(s)

Attachment B: Data Validation Report Form

Attachment A

Target Analyte Summary Hitlist(s)

Soil Target Analyte Summary Hit List (Hexavalent Chromium)

Site Name PPG Garfield Avenue Supplemental Remedial Investigation (GARIS) Forrest Street
Sampling Date March 10, 2014
Lab Name/ID Accutest, Dayton, NJ
SDG No JB61462
Sample Matrix Soil
Trip Blank ID NA
Field Blank ID FS-FB20140310

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
EF-57A-10.0-10.5	JB61462-2	CHROMIUM (HEXAVALENT)	U	8.8	8.8	0.47		
EF-57A-13.5-14.0	JB61462-3	CHROMIUM (HEXAVALENT)	U	6.2	6.2	0.45		
EF-57A-13.5-14.0X	JB61462-4	CHROMIUM (HEXAVALENT)	U	6.9	6.9	0.46		
EF-57A-20.0-20.5	JB61462-6	CHROMIUM (HEXAVALENT)	U	7.1	7.1	0.45		
EF-57A-22.0-22.5	JB61462-7	CHROMIUM (HEXAVALENT)	U	3.5	3.5	0.48		
EF-57A-24.0-24.5	JB61462-8	CHROMIUM (HEXAVALENT)	U	0.53	0.53	0.48		
EF-57A-26.0-26.5	JB61462-10	CHROMIUM (HEXAVALENT)	U	0.14B	0.14	0.49	Qualify	31
EF-57A-28.0-28.5	JB61462-11	CHROMIUM (HEXAVALENT)	U	0.61	0.61	0.51		
EF-57A-30.0-30.5	JB61462-12	CHROMIUM (HEXAVALENT)	U	0.54	0.54	0.48		
EF-57A-32.0-32.5	JB61462-13	CHROMIUM (HEXAVALENT)	U	0.61	0.61	0.50		
EF-57A-34.0-34.5	JB61462-14	CHROMIUM (HEXAVALENT)	U	0.087B	0.087	0.49	Qualify	31
EF-57A-36.0-36.5	JB61462-15	CHROMIUM (HEXAVALENT)	U	0.085B	0.085	0.49	Qualify	31

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

NJDEP Laboratory Footnote

1. The value reported is less than or equal to 3x the value in the preparation/reagent blank. It is the policy of NJDEP-DPFSSR to negate the reported value due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
2. The value reported is greater than three (3) times but less than ten (10) times the value in the preparation/reagent blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to the preparation/reagent blank contamination. The "B" qualifier alerts the end-user to the presence of this analyte in the preparation/reagent blank.
3. The value reported is less than or equal to three (3) times the value in the trip/field blank. It is the policy of NJDEP-DPFSSR to negate the reported value as due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
4. The value reported is greater than three (3) times but less than ten (10) times the value in the trip/field blanks and is considered "real". However, the reported value must be quantitatively qualified "J" due to trip/field blank contamination.
5. The concentration reported by the laboratory is incorrectly calculated.
6. The laboratory failed to report the presence of the analyte in the sample.
7. The reported Hexavalent Chromium value was qualified because the Calibration Check Standard was not within the recovery range (90-110 percent).
8. In the Duplicate Sample Analysis, Hexavalent Chromium fell outside the control limits of ≤ 20 percent for sample results $> 4xRL$ or $+ RL$ for sample results $< 4xRL$. Therefore, the result was qualified.
9. This analyte was rejected because the laboratory performed the Duplicate Analysis on a field blank.
10. The reported value was qualified because the PVS recovery was greater than 115 percent.
11. The reported value was qualified because the PVS recovery was less than 85 percent.
12. The non-detected value was qualified (UJ) because the PVS recovery was less than 85 percent. The possibility of a false negative exists.

13. The reported analyte was qualified because the associated Calibration Blank result was greater than the MDL.
14. The laboratory made a transcription error. No hits were found in the raw data.
15. This analyte is qualified or rejected because the laboratory exceeded the holding time for digestion and/or analysis.
16. The laboratory subtracted the preparation/reagent blank from the sample result. The Reviewer's calculation puts the preparation/reagent blank back into the result.
17. The photocopy is unreadable. Therefore, the QA reviewer cannot read the laboratory's reported concentration result.
18. The reported value was qualified because the predigestion spike recovery was less than 75 %, but greater than 50%.
19. The reported value was qualified because the predigestion spike recovery was greater than 125 percent.
20. The non-detected value was qualified (UJ) because the redigestion spike recovery was less than 75 percent. The possibility of a false negative exists.
21. The reported result was qualified or rejected because the laboratory did not record the pH value(s) of the sample in a laboratory notebook.
22. The reported value was qualified (J/UJ) because the sample moisture content exceeded 50 percent.
23. The sample result was rejected because the soluble and insoluble matrix spike recoveries were less than 50%.
24. The detected sample result was qualified (J) because the incorrect spike concentration was used.
25. The reported sample results were rejected because the predigestion spike recovery was greater than 150 percent.
26. The reported sample results were rejected because the redigestion spike recovery was greater than 150 percent.
27. The reported value was qualified (J) because the redigestion spike recovery was less than 75 percent.
28. The reported value was qualified (J/UJ) because the sample digestion temperature was less than 90C.

29. In the Field Duplicate Sample Analysis, Hexavalent Chromium fell outside the control limits of $\leq 20\%$ for sample results $> 4xRL$ or $+ RL$ for sample results $< 4xRL$. Therefore, the result was qualified.
30. The reported value was qualified as estimated (J/UJ) but the bias is uncertain due to both high and low MS recoveries.
31. The reported result was greater than the MDL but less than the RL and qualified (J) as estimated by the laboratory.
32. The reported value was qualified because the sample replicate precision criterion of $\leq 20\%$ for method 7199 was exceeded.
33. The reported value was qualified (J/UJ) because the laboratory control sample (LCS) recovery was less than 80%.
34. The reported value was qualified (J) because the laboratory control sample (LCS) recovery was greater than 120%.
35. The reported result was qualified because the matrix spike analysis was not performed at the proper frequency.
36. The reported result was qualified because the laboratory duplicate analysis was not performed at the proper frequency.
37. The result was qualified because the cooler temperature upon sample receipt exceeded 6C.
38. The reported value was qualified because the redigestion spike recovery was greater than 125 percent.
39. The reported result was rejected because the laboratory failed to perform the reanalysis due to insufficient sample volume.
40. The reported results was qualified because the laboratory failed to analyze an ending CCB.
41. The reported result was qualified because the laboratory failed to make the proper method specific pH adjustment.
42. The reported result was rejected because the laboratory failed to reanalyze the MS and associated sample(s) due to failed MS recoveries.
43. The result was qualified due to negative instrument drift.

Aqueous Target Analyte Summary Hit List (Hexavalent Chromium)

Site Name PPG Garfield Avenue Supplemental Remedial Investigation (GARIS) Forrest Street
Sampling Date March 10, 2014
Lab Name/ID Accutest, Dayton, NJ
SDG No JB61462
Sample Matrix Groundwater
Trip Blank ID NA
Field Blank ID NA

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/L)	Laboratory Sample Result (mg/L)	Validation Sample Result (mg/L)	RL (mg/L)	Quality Assurance Decision	NJDEP Validation Footnote
EF-57A-10.0-14.0	JB61462-1	CHROMIUM (HEXAVALENT)	-0.006	0.067	0.067	0.010	Qualify	11,43
EF-57A-20.0-24.0	JB61462-5	CHROMIUM (HEXAVALENT)	-0.006	U	U	0.010	Qualify	11,43
EF-57A-30.0-34.0	JB61462-9	CHROMIUM (HEXAVALENT)	-0.006	U	U	0.010	Qualify	11,43
EF-57A-40.0-44.0	JB61462-17	CHROMIUM (HEXAVALENT)	-0.006	U	U	0.010	Qualify	11,43
EF-57A-40.0-44.0X	JB61462-18	CHROMIUM (HEXAVALENT)	-0.006	U	U	0.010	Qualify	11,43
FS-FB20140310	JB61462-19	CHROMIUM (HEXAVALENT)	-0.006	U	U	0.010	Qualify	11,43

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

NJDEP Laboratory Footnote

1. The value reported is less than or equal to 3x the value in the preparation/reagent blank. It is the policy of NJDEP-DPFSR to negate the reported value due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
2. The value reported is greater than three (3) times but less than ten (10) times the value in the preparation/reagent blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to the preparation/reagent blank contamination. The "B" qualifier alerts the end-user to the presence of this analyte in the preparation/reagent blank.
3. The value reported is less than or equal to three (3) times the value in the trip/field blank. It is the policy of NJDEP-DPFSR to negate the reported value as due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.

4. The value reported is greater than three (3) times but less than ten (10) times the value in the trip/field blanks and is considered "real". However, the reported value must be quantitatively qualified "J" due to trip/field blank contamination.
5. The concentration reported by the laboratory is incorrectly calculated.
6. The laboratory failed to report the presence of the analyte in the sample.
7. The reported Hexavalent Chromium value was qualified because the Calibration Check Standard was not within the recovery range (90-110 percent).
8. In the Duplicate Sample Analysis, Hexavalent Chromium fell outside the control limits of ≤ 20 percent for sample results $> 4xRL$ or $+ RL$ for sample results $< 4xRL$. Therefore, the result was qualified.
9. This analyte was rejected because the laboratory performed the Duplicate Analysis on a field blank.
10. The reported value was qualified because the PVS recovery was greater than 115 percent.
11. The reported value was qualified because the PVS recovery was less than 85 percent.
12. The non-detected value was qualified (UJ) because the PVS recovery was less than 85 percent. The possibility of a false negative exists.
13. The reported analyte was qualified because the associated Calibration Blank result was greater than the MDL.
14. The laboratory made a transcription error. No hits were found in the raw data.
15. This analyte is qualified or rejected because the laboratory exceeded the holding time for digestion and/or analysis.
16. The laboratory subtracted the preparation/reagent blank from the sample result. The Reviewer's calculation puts the preparation/reagent blank back into the result.
17. The photocopy is unreadable. Therefore, the QA reviewer cannot read the laboratory's reported concentration result.
18. The reported value was qualified because the predigestion spike recovery was less than 75 %, but greater than 50%.
19. The reported value was qualified because the predigestion spike recovery was greater than 125 percent.

20. The non-detected value was qualified (UJ) because the redigestion spike recovery was less than 75 percent. The possibility of a false negative exists.
21. The reported result was qualified or rejected because the laboratory did not record the pH value(s) of the sample in a laboratory notebook.
22. The reported value was qualified (J/UJ) because the sample moisture content exceeded 50 percent.
23. The sample result was rejected because the soluble and insoluble matrix spike recoveries were less than 50%.
24. The detected sample result was qualified (J) because the incorrect spike concentration was used.
25. The reported sample results were rejected because the predigestion spike recovery was greater than 150 percent.
26. The reported sample results were rejected because the redigestion spike recovery was greater than 150 percent.
27. The reported value was qualified (J) because the redigestion spike recovery was less than 75 percent.
28. The reported value was qualified (J/UJ) because the sample digestion temperature was less than 90C.
29. In the Field Duplicate Sample Analysis, Hexavalent Chromium fell outside the control limits of $\leq 20\%$ for sample results $> 4xRL$ or $+ RL$ for sample results $< 4xRL$. Therefore, the result was qualified.
30. The reported value was qualified as estimated (J/UJ) but the bias is uncertain due to both high and low MS recoveries.
31. The reported result was greater than the MDL but less than the RL and qualified (J) as estimated by the laboratory.
32. The reported value was qualified because the sample replicate precision criterion of $\leq 20\%$ for method 7199 was exceeded.
33. The reported value was qualified (J/UJ) because the laboratory control sample (LCS) recovery was less than 80%.
34. The reported value was qualified (J) because the laboratory control sample (LCS) recovery was greater than 120%.
35. The reported result was qualified because the matrix spike analysis was not performed at the proper frequency.

36. The reported result was qualified because the laboratory duplicate analysis was not performed at the proper frequency.
37. The result was qualified because the cooler temperature upon sample receipt exceeded 6C.
38. The reported value was qualified because the redigestion spike recovery was greater than 125 percent.
39. The reported result was rejected because the laboratory failed to perform the reanalysis due to insufficient sample volume.
40. The reported results was qualified because the laboratory failed to analyze an ending CCB.
41. The reported result was qualified because the laboratory failed to make the proper method specific pH adjustment.
42. The reported result was rejected because the laboratory failed to reanalyze the MS and associated sample(s) due to failed MS recoveries.
43. The result was qualified due to negative instrument drift.

Soil Target Analyte Summary Hit List (Metals)

Site Name PPG Garfield Avenue Supplemental Remedial Investigation (GARIS) Forrest Street
Sampling Date March 10, 2014
Lab Name/ID Accutest, Dayton, NJ
SDG No JB61462A
Sample Matrix Soil
Trip Blank ID NA
Field Blank ID FS-FB20140310

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
EF-57A-10.0-10.5	JB61462-2A	ANTIMONY	U	0.32B	0.32	2.3	Qualify	15,23
EF-57A-10.0-10.5	JB61462-2A	CHROMIUM	U	61.3	61.3	1.2		
EF-57A-10.0-10.5	JB61462-2A	NICKEL	U	11.8	11.8	4.6		
EF-57A-10.0-10.5	JB61462-2A	VANADIUM	U	20.2	20.2	5.8		
EF-57A-13.5-14.0	JB61462-3A	ANTIMONY	U	0.40B	0.40	2.3	Qualify	15,23
EF-57A-13.5-14.0	JB61462-3A	CHROMIUM	U	61.8	61.8	1.2		
EF-57A-13.5-14.0	JB61462-3A	NICKEL	U	12.4	12.4	4.6		
EF-57A-13.5-14.0	JB61462-3A	VANADIUM	U	22.8	22.8	5.8		
EF-57A-13.5-14.0X	JB61462-4A	ANTIMONY	U	0.35B	0.35	2.4	Qualify	15,23
EF-57A-13.5-14.0X	JB61462-4A	CHROMIUM	U	76.9	76.9	1.2		
EF-57A-13.5-14.0X	JB61462-4A	NICKEL	U	11.7	11.7	4.8		
EF-57A-13.5-14.0X	JB61462-4A	VANADIUM	U	22.8	22.8	6.0		
EF-57A-20.0-20.5	JB61462-6A	ANTIMONY	U	0.41B	0.41	2.2	Qualify	15,23
EF-57A-20.0-20.5	JB61462-6A	CHROMIUM	U	26.0	26.0	1.1		
EF-57A-20.0-20.5	JB61462-6A	NICKEL	U	9.1	9.1	4.5		
EF-57A-20.0-20.5	JB61462-6A	VANADIUM	U	18.5	18.5	5.6		
EF-57A-22.0-22.5	JB61462-7A	ANTIMONY	U	U	U	2.3	Qualify	15
EF-57A-22.0-22.5	JB61462-7A	CHROMIUM	U	22.7	22.7	1.2		

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
EF-57A-22.0-22.5	JB61462-7A	NICKEL	U	5.6	5.6	4.6		
EF-57A-22.0-22.5	JB61462-7A	VANADIUM	U	10.2	10.2	5.8		
EF-57A-24.0-24.5	JB61462-8A	ANTIMONY	U	U	U	2.4	Qualify	15
EF-57A-24.0-24.5	JB61462-8A	CHROMIUM	U	8.5	8.5	1.2		
EF-57A-24.0-24.5	JB61462-8A	NICKEL	U	4.5B	4.5	4.8	Qualify	23
EF-57A-24.0-24.5	JB61462-8A	VANADIUM	U	10.4	10.4	6.0		
EF-57A-26.0-26.5	JB61462-10A	ANTIMONY	U	U	U	2.5	Qualify	15
EF-57A-26.0-26.5	JB61462-10A	CHROMIUM	U	6.1	6.1	1.2		
EF-57A-26.0-26.5	JB61462-10A	NICKEL	U	3.6B	3.6	4.9	Qualify	23
EF-57A-26.0-26.5	JB61462-10A	VANADIUM	U	9.4	9.4	6.1		
EF-57A-28.0-28.5	JB61462-11A	ANTIMONY	U	U		2.7	Qualify	15
EF-57A-28.0-28.5	JB61462-11A	CHROMIUM	U	8.9	8.9	1.3		
EF-57A-28.0-28.5	JB61462-11A	NICKEL	U	5.8	5.8	5.4		
EF-57A-28.0-28.5	JB61462-11A	VANADIUM	U	11.4	11.4	6.7		
EF-57A-30.0-30.5	JB61462-12A	ANTIMONY	U	U	U	2.3	Qualify	15
EF-57A-30.0-30.5	JB61462-12A	CHROMIUM	U	11.7	11.7	1.2		
EF-57A-30.0-30.5	JB61462-12A	NICKEL	U	4.3B	4.3	4.6	Qualify	23
EF-57A-30.0-30.5	JB61462-12A	VANADIUM	U	9.9	9.9	5.8		
EF-57A-32.0-32.5	JB61462-13A	ANTIMONY	U	U	U	2.5	Qualify	15
EF-57A-32.0-32.5	JB61462-13A	CHROMIUM	U	10.3	10.3	1.2		
EF-57A-32.0-32.5	JB61462-13A	NICKEL	U	4.3B	4.3	4.9	Qualify	23
EF-57A-32.0-32.5	JB61462-13A	VANADIUM	U	10.7	10.7	6.2		
EF-57A-34.0-34.5	JB61462-14A	ANTIMONY	U	0.43B	0.43	2.4	Qualify	15,23
EF-57A-34.0-34.5	JB61462-14A	CHROMIUM	U	15.0	15.0	1.2		
EF-57A-34.0-34.5	JB61462-14A	NICKEL	U	10.9	10.9	4.8		

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
EF-57A-34.0-34.5	JB61462-14A	VANADIUM	U	16.9	16.9	6.0		
EF-57A-36.0-36.5	JB61462-15A	ANTIMONY	U	0.65B	0.65	2.4	Qualify	15,23
EF-57A-36.0-36.5	JB61462-15A	CHROMIUM	U	21.6	21.6	1.2		
EF-57A-36.0-36.5	JB61462-15A	NICKEL	U	23.0	23.0	4.8		
EF-57A-36.0-36.5	JB61462-15A	VANADIUM	U	26.3	26.3	6.0		
EF-57A-36.0-36.5	JB61462-15A	THALLIUM	U	0.90B	0.90	1.2	Qualify	23
EF-57A-38.0-38.5	JB61462-16A	ANTIMONY	U	U	U	2.5	Qualify	15
EF-57A-38.0-38.5	JB61462-16A	CHROMIUM	U	10.8	10.8	1.2		
EF-57A-38.0-38.5	JB61462-16A	NICKEL	U	8.8	8.8	5.0		
EF-57A-38.0-38.5	JB61462-16A	VANADIUM	U	14.7	14.7	6.2		

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

NJDEP Laboratory Footnote

1. The value reported is less than or equal to 3x the value in the method blank. It is the policy of NJDEP-DPFSR to negate the reported value due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
2. The value reported is greater than three (3) but less than ten (10) times the value in the method blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to the method blank contamination. The "B" qualifier alerts the end-user to the presence of this analyte in the method blank.
3. The value reported is less than or equal to 3x the value in the trip/field blank. It is the policy of NJDEP-DPFSR to negate the reported value as due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
4. The value reported is greater than 3x but less than ten (10) the value in the trip/field blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to trip/field blank contamination.

5. The concentration reported by the laboratory is incorrectly calculated.
6. The laboratory failed to report the presence of the analyte in the sample.
7. The reported metal value was qualified because the Calibration Verification Standard was not within the recovery range (90-110 percent).
8. In the MS/MSD Sample Analysis, this analyte fell outside the control limits of 20% RPD. Therefore, the result was qualified.
9. This analyte was qualified because the laboratory performed the MS/MSD Analysis on a field blank.
10. The reported analyte was qualified because the associated Calibration Blank result was greater than the MDL.
11. The reported value was qualified because serial dilution analysis was not within QC limit of 10% D.
12. This analyte is rejected because the laboratory exceeded the holding time for digestion and analysis.
13. The laboratory subtracted the method blank from the sample result. The reviewer's calculation has added the method blank result to the reported concentration.
14. The photocopy submitted is illegible. Therefore, the QA reviewer cannot read the laboratory's reported concentration result.
15. The reported or nondetected value was qualified because the MS/MSD spike recovery was less than 75 percent.
16. The reported value was qualified because the MS/MSD spike recovery was greater than 125 percent.
17. The reported value was qualified as estimated (J/UJ) but the bias is uncertain due to both high and low MS recoveries.
18. The reported values were qualified because the laboratory duplicate exceeded 35 percent RPD for results greater than 5X the reporting limit or the absolute difference exceeded two times the reporting limit for sample result less than 5 times the reporting limit.
19. The reported value was qualified because the field duplicate exceeded 35 percent RPD for results greater than 5X the reporting limit or the absolute difference exceeded two times the reporting limit for sample result less than 5 times the reporting limit.
20. The reported value was qualified because the LCS recovery was less than 80 percent.
21. The reported value was qualified because the sample moisture content was greater than 50 percent.

22. The reported value was rejected because the field duplicate absolute difference was greater than 4 times the RL or the RPD was greater than 120%.
23. The reported result was greater than the MDL but less than the RL and qualified (J) as estimated by the laboratory.
24. The field duplicate absolute difference exceeded two times the reporting limit for sample result less than 5 times the reporting limit.
25. The reported value was qualified because the LCS recovery was greater than 120 percent.
26. The reported value was qualified because the field duplicate exceeded 20 percent RPD for results greater than 5X the reporting limit or the absolute difference exceeded the reporting limit for sample result less than 5 times the reporting limit.

Aqueous Target Analyte Summary Hit List (Metals)

Site Name PPG Garfield Avenue Supplemental Remedial Investigation (GARIS) Forrest Street
Sampling Date March 10, 2014
Lab Name/ID Accutest, Dayton, NJ
SDG No JB61462A
Sample Matrix Groundwater
Trip Blank ID NA
Field Blank ID NA

Field Sample ID	Lab Sample ID	Analyte	Method Blank (ug/L)	Laboratory Sample Result (ug/L)	Validation Sample Result (ug/L)	RL (ug/L)	Quality Assurance Decision	NJDEP Validation Footnote
EF-57A-10.0-14.0	JB61462-1A	CHROMIUM	U	15600	15600	50	Qualify	15,26
EF-57A-20.0-24.0	JB61462-5A	CHROMIUM	U	3220	3220	50	Qualify	15,26
EF-57A-30.0-34.0	JB61462-9A	CHROMIUM	U	3110	3110	20	Qualify	15,26
EF-57A-40.0-44.0	JB61462-17A	CHROMIUM	U	7020	7020	50	Qualify	15,26
EF-57A-40.0-44.0X	JB61462-18A	CHROMIUM	U	4610	4610	50	Qualify	15,26

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

NJDEP Laboratory Footnote

1. The value reported is less than or equal to 3x the value in the method blank. It is the policy of NJDEP-DPFSR to negate the reported value due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
2. The value reported is greater than three (3) but less than ten (10) times the value in the method blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to the method blank contamination. The "B" qualifier alerts the end-user to the presence of this analyte in the method blank.
3. The value reported is less than or equal to 3x the value in the trip/field blank. It is the policy of NJDEP-DPFSR to negate the reported value as due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.

4. The value reported is greater than 3x but less than ten (10) the value in the trip/field blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to trip/field blank contamination.
5. The concentration reported by the laboratory is incorrectly calculated.
6. The laboratory failed to report the presence of the analyte in the sample.
7. The reported metal value was qualified because the Calibration Verification Standard was not within the recovery range (90-110 percent).
8. In the MS/MSD Sample Analysis, this analyte fell outside the control limits of 20% RPD. Therefore, the result was qualified.
9. This analyte was qualified because the laboratory performed the MS/MSD Analysis on a field blank.
10. The reported analyte was qualified because the associated Calibration Blank result was greater than the MDL.
11. The reported value was qualified because serial dilution analysis was not within QC limit of 10% D.
12. This analyte is rejected because the laboratory exceeded the holding time for digestion and analysis.
13. The laboratory subtracted the method blank from the sample result. The reviewer's calculation has added the method blank result to the reported concentration.
14. The photocopy submitted is illegible. Therefore, the QA reviewer cannot read the laboratory's reported concentration result.
15. The reported or nondetected value was qualified because the MS/MSD spike recovery was less than 75 percent.
16. The reported value was qualified because the MS/MSD spike recovery was greater than 125 percent.
17. The reported value was qualified as estimated (J/UJ) but the bias is uncertain due to both high and low MS recoveries.
18. The reported values were qualified because the laboratory duplicate exceeded 35 percent RPD for results greater than 5X the reporting limit or the absolute difference exceeded two times the reporting limit for sample result less than 5 times the reporting limit.
19. The reported value was qualified because the field duplicate exceeded 35 percent RPD for results greater than 5X the reporting limit or the absolute difference exceeded two times the reporting limit for sample result less than 5 times the reporting limit.

20. The reported value was qualified because the LCS recovery was less than 80 percent.
21. The reported value was qualified because the sample moisture content was greater than 50 percent.
22. The reported value was rejected because the field duplicate absolute difference was greater than 4 times the RL or the RPD was greater than 120%.
23. The reported result was greater than the MDL but less than the RL and qualified (J) as estimated by the laboratory.
24. The field duplicate absolute difference exceeded two times the reporting limit for sample result less than 5 times the reporting limit.
25. The reported value was qualified because the LCS recovery was greater than 120 percent.
26. The reported value was qualified because the field duplicate exceeded 20 percent RPD for results greater than 5X the reporting limit or the absolute difference exceeded the reporting limit for sample result less than 5 times the reporting limit.

Attachment B

Data Validation Report Form

Client Name: PPG Industries	Project Number: 60154801.6001A
Site Location: PPG Garfield Avenue Supplemental Remedial Investigation (GARIS) Forrest Street Groundwater and Soil, Jersey City, NJ	Project Manager: William Spronz
Laboratory: Accutest, Dayton, NJ	Type of Validation: Full
Laboratory Job No: JB61462	Date Checked: 5/18/14
Validator: Paula DiMattei	Peer: Lisa Krowitz

ITEM	YES	NO	N/A	COMMENTS
Sample results included?	X			
Reporting Limits met project requirements?	X			
Field I.D. included?	X			
Laboratory I.D. included?	X			
Sample matrix included?	X			
Sample receipt temperature 2-6C?	X			
Signed COCs included?	X			
Date of sample collection included?	X			
Date of sample digestion included?	X			
Holding time to digestion met criteria? (Soils -30 days from collection to digestion.)	X			
Date of analysis included?	X			
Holding time to analysis met criteria? (Soils -168 hours from digestion to analysis; Aqueous - 24 hours from collection to analysis.)	X			
Method reference included?	X			
Laboratory Case Narrative included?	X			

Definitions: MDL Method Detection Limit; %R Percent Recovery; RL Reporting Limit; RPD Relative Percent Difference; RSD Relative Standard Deviation :Corr Correlation Coefficient.

ITEM	YES	NO	N/A	COMMENTS
Initial calibration documentation included in lab package?	X			
1) Blank plus 4 standards (7196A) or blank plus 3 standards (7199)	X			
2) Correlation coefficient of =0.995 (7196A) or =0.999 (7199)	X			
3) Calibrate daily or each time instrument is set up.	X			
Calibration Check Standard (CCS) for 7196A and Quality Control Sample (QCS) for 7199 Included in Lab Package?	X			
1) %R criteria met? (90 - 110%)	X			
2) Correct frequency of one per every 10 samples	X			
3) CCS and QCS from independent source and at mid-level of calibration curve	X			
Calibration Blanks	X			
1) Analyzed prior to initial calibration standards and after each CCS/QCS?	X			
2) Absolute value should not exceed MDL.		X		See nonconformance table below
Method Blank, Field Blanks and/or Equipment Blanks Included in Lab Package?	X			FS-FB20140310
1) Method blank analyzed with each preparation batch?	X			
2) Absolute value should not exceed MDL.		X		See nonconformance table below
Eh and pH Data	X			
1) Eh and pH data was included and plotted for all samples?	X			
Soluble Matrix Spike Data Included in Lab Package?	X			Soil: EF-57A-10.0-10.5 AQ: EF-57A-20.0-24.0 (see nonconformance table below for the AQ MS results)
1) Soluble Matrix %R criteria met? (75-125%R).	X			
2) Was the spike concentration 40 mg/Kg or twice the sample concentration?	X			
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	X			
Insoluble Matrix Spike Data Included in Lab Package?	X			
1) Insoluble Matrix %R criteria met? (75-125%R).	X			
2) Was the spike concentration around 400 to 800 mg/Kg?		X		Spiked at 1180 mg/kg. No impact to data.
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	X			

ITEM	YES	NO	N/A	COMMENTS
Post Digestion Spike	X			
1) Post Digestion Spike %R criteria met? (85-115%R).	X			Criteria were met for soils but not for AQ.
2) Was the spike concentration 40 mg/Kg or twice the sample concentration?	X			
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	X			
Sample Duplicate Data Included in Lab Package?	X			Soil: EF-57A-10.0-10.5 and AQ: EF-57A-20.0-24.0
1) RPD criteria met? (RPD ≤20%) if both results are ≤4x RL or absolute difference ≤RL if either or both results are <4xRL.	X			
2) Was a sample duplicate analyzed at the frequency of 1 per batch or 20 samples?	X			
Was a Laboratory Control Sample (LCS) Included in Lab Package?	X			
1) %R criteria met? (80-120%R).	X			
2) Was an LCS analyzed at the frequency of 1/batch or 20 samples?	X			
Were any Field Duplicate samples submitted with this SDG?	X			Soil: EF-57A-13.5-14.0/EF-57A-13.5-14.0X and EF-57A-40.0-44.0/EF-57A-40.0-44.0X
1) Were Field duplicate RPD criteria met? (RPD≤20% for both sample results >4xRL or absolute difference ≤ RL if either or both results are <4xRL.	X			
Were all sample quantitation and reporting requirements met?	X			
1) Were all solid samples reported with percent solids > 50% ?	X			
2) Were any samples analyzed or reported with dilutions?		X		
Miscellaneous Items	X			
1) For soils by 7196A, was the pH within a range of 7.0-8.0?	X			
2) For soils by 7199, was the pH within a range of 9.0-9.5?			X	
3) For aqueous by 7196A, was the pH with a range of 1.5-2.5?	X			
4) For soils (3060A), was the digestion temperature 90-95C for at least 60 minutes?	X			
5) For 7199, was each sample injected twice and was the RPD =20?			X	

Laboratory Blanks

Blank ID	Analyte	Result	QL	Units	Associated Samples
GN909-MB1	CHROMIUM (HEXAVALENT)	-0.006	0.01	mg/L	All aqueous samples

Matrix Spikes

Sample ID	Analyte	Analysis Batch	MS % Recovery	Lower Limit	Upper Limit	pH-adjusted PDS % Recovery	QC Limits
EF-57A-20.0-24.0	CHROMIUM (HEXAVALENT)	GN909	80.0	85	115	82	85-115

SDG#: JB61462
Batch: GN1243
 Cr+6 ICAL 03/15/14
 Soil
 (p. 61 of data pkg)

x - concentration	y - response
0	0
0.01	0.008
0.05	0.044
0.1	0.089
0.3	0.267
0.5	0.444
0.8	0.689
1	0.887

(p. 61 of data pkg)

AECOM Calculated Intercept	0.0005	OK	Reported intercept	0.0005
AECOM Slope	0.8783	OK	Reported Slope	0.8783
AECOM Calculated r	0.99981	OK	Reported r	0.99981

LCS calculation

GP78581-B1 p.316

Background Absorbance	0
Total absorbance	0.839
Total absorbance - background	0.839
Instrument Concentration	0.955
Sample weight (mg/kg)	0.0025
Final Volume (L)	0.1
Dilution Factor	1

AECOM Calculated LCS Result (mg/Kg)	38.2	OK	Reported Result (mg/Kg)	38.2
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%R = Found/True*100

p. 49

True Value (mg/kg)	40
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AECOM Calculated %R	95.5	OK	Reported %R	95.5
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MS calculation

JB61462-2 [EF-57A-10.0-10.5]p.61

Background reading	0
Total absorbance	0.394
Total absorbance - background	0.394
Instrument Concentration	0.4480
Sample weight (mg/kg)	0.00242
Final Volume (L)	0.1
Percent solids	0.847
Dilution Factor	50

AECOM Calculated MS Result (mg/Kg)	1090	OK	Reported Result (mg/Kg)	1090
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%R = Found/True*100

JB61462-2 [EF-57A-10.0-10.5]p.51

True Value (mg/kg)	1180
Native concentration (mg/Kg)	8.8

AECOM%R	91.9	OK rounding	Reported %R	91.8
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Percent Solids

JB61462-2 [EF-57A-10.0-10.5]p.52

Empty dish weight=	27.98
Wet weight=	35.29
Dry weight=	34.17

AECOM%solids =	84.7	OK	reported %solids=	84.7
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Reporting Limit**JB61462-2 [EF-57A-10.0-10.5]p.12**

Low Standard	0.01		
Initial weight (mg/kg)	0.00243		
Final volume (L)	0.1		
Percent solids	0.847		
Dilution Factor	1		
Reporting Limit	0.49	OK rounding	Reported RL (mg/Kg)= 0.47

Sample Calculations**JB61462-2 [EF-57A-10.0-10.5]p.12, 61**

Background reading	0		
Total absorbance	0.159		
Total absorbance - background	0.159		
Instrument Response	0.180		
Sample weight (mg/kg)	0.00243		
Final Volume (L)	0.1		
Percent solids	0.847		
Dilution Factor	1		
AECOM Calculated Result (mg/Kg)	8.8	OK	Reported Result (mg/Kg) 8.8

JB61462-3 [EF-57A-13.5-14.0]p.13, 61

Background reading	0.001		
Total absorbance	0.123		
Total absorbance - background	0.122		
Instrument Response	0.138		
Sample weight (mg/kg)	0.00252		
Final Volume (L)	0.1		
Percent solids	0.886		
Dilution Factor	1		
AECOM Calculated Result (mg/Kg)	6.2	OK	Reported Result (mg/Kg) 6.2

Client Name: PPG Industries	Project Number: 60154801.6001A
Site Location: PPG Garfield Avenue Supplemental Remedial Investigation (GARIS) Forrest Street Groundwater and Soils, Jersey City, NJ	Project Manager: William Spronz
Laboratory: Accutest, Dayton, NJ	Type of Validation: Limited
Laboratory Job No: JB61462A	Date Checked: 5/18/14
Validator: Paula DiMattei	Peer: Lisa Krowitz

ITEM	YES	NO	N/A	COMMENTS
Sample results included?	X			
Reporting Limits met project requirements?	X			
Field I.D. included?	X			
Laboratory I.D. included?	X			
Sample matrix included?	X			
Sample receipt temperature 2-6C?	X			
Signed COCs included?	X			
Date of sample collection included?	X			
Date of sample digestion included?	X			
Date of analysis included?	X			
Holding time met QC criteria? (Metals -180 days from sample collection; Mercury - 28 days from sample collection. If HT exceeded by 10 days R all results.	X			
Method reference included?	X			
Laboratory Case Narrative included?	X			

Definitions: MDL Method Detection Limit; %R Percent Recovery; RL Reporting Limit; RPD Relative Percent Difference; RSD Relative Standard Deviation ;Corr Correlation Coefficient.

ITEM	YES	NO	N/A	COMMENTS
Sample dilutions?	X			
Initial calibration documentation included in lab package?			X	NA for a Limited review
1) Calibrate daily or each time instrument is set up.			X	
2) ICP (6010) -Blank plus 1 standard? If no, reject (R) data.			X	
3) Hg (7470/7471) -Blank plus 5 standards? If no, reject (R) data.			X	
Initial Calibration Verification Standard (ICV) for ICP (6010) and Initial Calibration Check Standard (ICCS) for Hg (7470/7471) included in lab package?			X	
1) Analyzed immediately after initial calibration? If no, reject (R) data.			X	
2) %R criteria met? (90-110%). If no, J positive results for affected analyte(s) if %R between 80-89% and 111-120% and indicate bias; UJ non-detect results for affected analyte(s) if %R between 80-89% , and R all data for affected analyte(s) if %R 120%.			X	
3) Spot check ICV/ICCS results for several analytes.			X	
Continuing Calibration Verification Standard (CCV) for ICP (6010) and Calibration Check Standard (CCS) for Hg (7470/7471) included in Lab Package?			X	
1) Analyzed immediately after each ICV/ICC/CB and after every 10 samples? If no, reject (R) data.			X	
2) CCS and CCV from independent source and at mid-level of calibration curve. If no, reject (R) data.			X	
3) %R criteria met? (90-110%R). If no, J positive results for affected analyte(s) if %R between 80-89% and 111-120% and indicate bias; UJ non-detect results for affected analyte(s) if %R between 80-89% and R all data for affected analyte(s) if %R 120%.			X	
4) Spot check CCV/CCS results for several analytes.			X	
Low Calibration Standard (CRI) included in Lab Package?			X	
1) %R criteria met? - 50-150% for Co, Mn, Zn, by ICP-MS; Pb, Tl by 6010; 70-130% all others. If no, refer to ILM05.4 NJ SOP 5.A.2 for actions.			X	

ITEM	YES	NO	N/A	COMMENTS
Calibration Blanks			X	
1) Analyzed after daily calibration and after each ICV/ICC/CCV/CCS and after every 10 samples? If no, reject (R) data.			X	
2) Absolute value 10xCB result, no qualification.			X	
Method Blank Included in Lab Package?	X			
1) Method blank analyzed with each preparation batch or every SDG, or 1/20 samples? If no, reject (R) data, except no aqueous MB required for FB/EB if only soil samples were analyzed.	X			
2) Method blank analyzed 1/20 samples? If - MB 1/25, J sample results from 21-25; -MB >1/25, R sample results after 25th sample.	X			
3) MB results nondetect? If no, -sample result 3xMB but 10xMB, no qualification.		X		See nonconformance table below.
4) Negative MB result reported? If yes, -Positive sample result		X		
Field Blanks/Equipment Blanks Included in Lab Package?	X			FS-FB20140310
1) FB/EB result non-detect? If no, -sample result 3xFB/EB but 10xFB/EB, no qualification.	X			
ICP Interference Check Sample (ICS) included in Lab Package?			X	NA for a Limited review
1) Analyzed at beginning of analytical run? If no, reject (R) data.			X	
2) %R criteria met? (80-120%) If no, %R>120%, no qualification if sample result non-detect; %R between 121-150%, J positive results, biased high; %R between 50-79%, J/UJ results, biased low; %R150%, reject (R) result			X	
3) Spot check accuracy of %Rs			X	
Matrix Spike/Matrix Spike Duplicate Data Included in Lab Package?	X			Soil: EF-57A-10.0-10.5 and AQ: EF-57A-20.0-24.0
1) MS/MSD %R (75-125%R) and RPD (+20%) criteria met? - %R>125% J positive results for affected analyte(s) for all samples in the same batch/SDG, accept NDs; -%R		X		see nonconformance table below.
2) Was a sample spiked at the frequency of 1/batch or 20 samples?	X			
3) Was the MS performed on a site sample?	X			
4) Was the MS performed on a FB/EB or TB? If yes, J all sample data.		X		

ITEM	YES	NO	N/A	COMMENTS
Post Digestion Spike			X	NA for a Limited review
1) %R criteria met? (75-125%R) - %R>125% J positive results for affected analyte(s) for all samples in the same batch/SDG, accept NDs.; - %R			X	
2) Was the spike performed on a FB/EB or TB? If yes, J all sample data.			X	
3) Was a sample spiked at the frequency of 1/batch or 20 samples?			X	
Laboratory Duplicate Data Included in Lab Package?		X		MS/MSD analyses were performed in lieu of a laboratory duplicate analysis.
Aqueous - If RPD is >20% but 5x the QL, estimate (J) results >the QL. - If RPD is >100%, reject R results >/= the QL.- If sample and/or duplicate is the QL, estimate (J) positive results 2x the QL, reject R non-detects and positive results			X	
Soil - If RPD is >35% but 5x the QL, estimate (J) results > the QL. - If RPD is >120%, reject results > the QL. - If sample and/or duplicate is 2x the QL, estimate (J) positive results 4x the QL, reject nondetects and positive results			X	
Was a Laboratory Control Sample (LCS) Included in Lab Package?	X			
1) LCS %R criteria met? (80-120%R). If no, J/UJ all affected analytes(s) for all samples in the same batch/SDG.	X			
2) Was an LCS analyzed at the frequency of 1/batch or 20 samples? If no, J/UJ affected analyte(s) for all samples in the same batch/SDG.	X			
Serial Dilution			X	NA for a Limited review
1) %D(25xIDL (7000) or >10xIDL (6010) and %D >10% J positive results for affected analyte(s) for all samples in the same batch/SDG, accept NDs.			X	
2) Was the frequency 1/batch or 20 samples?			X	
3) Was a site sample used?			X	
4) Was a FB/EB or TB used? If yes, J all sample data.			X	
5) Spot check accuracy of %Ds.			X	

ITEM	YES	NO	N/A	COMMENTS
Field Duplicate Data included in Lab Package?	X			Soil: EF-57A-13.5-14.0/EF-57A-13.-14.0X and EF-57A-40.0-44.0/EF-57A-40.0-44.0X
Aqueous - If RPD is >20% but 5x the QL, estimate (J) results > the QL. - If RPD is >100%, reject R results >= the QL. - If sample and/or duplicate is the QL, estimate (J) positive results 2x the QL, reject R non-detects and positive results		X		see nonconformance table below.
Soil - If RPD is >35% but 5x the QL, estimate (J) results > the QL. - If RPD is >120%, reject results > the QL. - If sample and/or duplicate is 2x the QL, estimate (J) positive results 4x the QL, reject nondetects and positive results	X			
Percent Solids data included in Lab Package?	X			
1) %Solids criteria (Reg 2 criteria) met? (>=50%)	X			

Laboratory Blanks

Blank ID	Analyte	Result	QL	Units	Associated Samples
MP78220-MB1	Thallium	1.5	10	µg/L	FS-FB20140310

Matrix Spikes

Sample ID	Analyte	MS % Recovery	MSD % Recovery	Lower Limit	Upper Limit
EF-57A-10.0-10.5	ANTIMONY	43.5	42.0	75	125
EF-57A-20.0-24.0	CHROMIUM	ok	53.0	75	125

Field Duplicates

Sample ID	Duplicate ID	Analyte	Sample Result	Qual	Duplicate Result	Qual	QL	Units	RPD
EF-57A-40.0-44.0	EF-57A-40.0-44.0X	Chromium	7020		4610		50	ug/L	41.4

Data Validation Report

Project:	PPG Garfield Avenue Supplemental Remedial Investigation (GARIS) Forrest Street Groundwater and Soil	
Laboratory:	Accutest, Dayton, NJ	
Laboratory Job No.:	JB61703 and JB61703A	
Analysis/Method:	Hexavalent Chromium SW846 3060A/7196 Metals by ICP-AES/ SW846-6010	
Validation Level:	Full (Hexavalent chromium) Limited (Metals)	
Site Location/Address:	Forrest Street, Jersey City, NJ	
AECOM Project No:	60154801.6001A	
Prepared by:	Paula DiMattei /AECOM	Completed on: 05/19/2014
Reviewed by:	Lisa Krowitz /AECOM	File Name: JB61703_A_2014-05-19_DV Report-F

Introduction

The data were reviewed in accordance with the FSP-QAPP and the following NJDEP validation Standard Operating Procedures (SOP):

- NJDEP Office of Data Quality SOP 5.A.10, Rev 3 (September 2009), SOP for Analytical Data Validation of Hexavalent Chromium - for USEPA SW-846 Method 3060A, USEPA SW-846 Method 7196A and USEPA SW-846 Method 7199;
- NJDEP Office of Data Quality SOP 5.A.16, Rev 1 (May 2002), Quality Assurance Data Validation of Analytical Deliverables for Inorganics (based on USEPA SW-846 Methods)

The results of quality control data analyzed with site samples were used to assess the overall reliability of the data. The following qualifiers were used to identify data quality issues:

- U: Indicates the analyte was not detected in the sample above the sample reporting limit.
- J: Indicates the result was an estimated value; the associated numerical value was an approximate concentration of the analyte in the sample.
- UJ: Indicates the analyte was not detected above the reporting limit and the reporting limit was approximate.
- R: The sample result was rejected due to serious deficiencies; the presence or absence of the analyte could not be confirmed.
- RA: The sample result was rejected but is still considered usable.

Sample Information

The samples listed below were collected by AECOM on March 12, 2014 as part of the PPG Garfield Avenue Supplemental Remedial Investigation (GARIS) Forrest Street Groundwater and Soil sampling at the PPG Forrest Street, Jersey City, NJ. Only the samples and parameters listed below were validated.

Field ID	Laboratory ID	Matrix	Fraction
EF-112A-10.0-10.5	JB61703-4	Soil	Hexavalent Chromium
EF-112A-10.0-10.5	JB61703-4A	Soil	Metals
EF-112A-10.0-14.0	JB61703-2	Ground Water	Hexavalent Chromium
EF-112A-10.0-14.0	JB61703-2A	Ground Water	Metals
EF-112A-12.0-12.5	JB61703-5	Soil	Hexavalent Chromium
EF-112A-12.0-12.5	JB61703-5A	Soil	Metals
EF-112A-14.0-14.5	JB61703-6	Soil	Hexavalent Chromium
EF-112A-14.0-14.5	JB61703-6A	Soil	Metals
EF-112A-14.0-14.5X (Field Duplicate of EF-112A-14.0-14.5)	JB61703-7	Soil	Hexavalent Chromium
EF-112A-14.0-14.5X (Field Duplicate of EF-112A-14.0-14.5)	JB61703-7A	Soil	Metals
EF-112A-16.0-16.5	JB61703-8	Soil	Hexavalent Chromium
EF-112A-16.0-16.5	JB61703-8A	Soil	Metals
EF-112A-18.0-18.5	JB61703-9	Soil	Hexavalent Chromium
EF-112A-18.0-18.5	JB61703-9A	Soil	Metals
EF-112A-2.0-2.5	JB61703-1	Soil	Hexavalent Chromium
EF-112A-2.0-2.5	JB61703-1A	Soil	Metals
EF-112A-20.0-20.5	JB61703-10	Soil	Hexavalent Chromium
EF-112A-20.0-20.5	JB61703-10A	Soil	Metals
EF-112A-20.0-24.0	JB61703-3	Ground Water	Hexavalent Chromium
EF-112A-20.0-24.0	JB61703-3A	Ground Water	Metals
EF-112A-22.0-22.5	JB61703-11	Soil	Hexavalent Chromium
EF-112A-22.0-22.5	JB61703-11A	Soil	Metals
EF-112A-24.0-24.5	JB61703-12	Soil	Hexavalent Chromium
EF-112A-24.0-24.5	JB61703-12A	Soil	Metals
EF-112A-26.0-26.5	JB61703-13	Soil	Hexavalent Chromium
EF-112A-26.0-26.5	JB61703-13A	Soil	Metals
EF-112A-28.0-28.5	JB61703-14	Soil	Hexavalent Chromium
EF-112A-28.0-28.5	JB61703-14A	Soil	Metals
EF-112A-30.0-30.5	JB61703-24	Soil	Hexavalent Chromium
EF-112A-30.0-30.5	JB61703-24A	Soil	Metals
EF-112A-30.0-34.0	JB61703-15	Ground Water	Hexavalent Chromium
EF-112A-30.0-34.0	JB61703-15A	Ground Water	Metals
EF-112A-32.0-32.5	JB61703-16	Soil	Hexavalent Chromium

Field ID	Laboratory ID	Matrix	Fraction
EF-112A-32.0-32.5	JB61703-16A	Soil	Metals
EF-112A-34.0-34.5	JB61703-17	Soil	Hexavalent Chromium
EF-112A-34.0-34.5	JB61703-17A	Soil	Metals
EF-112A-36.0-36.5	JB61703-18	Soil	Hexavalent Chromium
EF-112A-36.0-36.5	JB61703-18A	Soil	Metals
EF-112A-38.0-38.5	JB61703-19	Soil	Hexavalent Chromium
EF-112A-38.0-38.5	JB61703-19A	Soil	Metals
EF-112A-4.0-4.5	JB61703-21	Soil	Hexavalent Chromium
EF-112A-4.0-4.5	JB61703-21A	Soil	Metals
EF-112A-40.0-44.0	JB61703-20	Ground Water	Hexavalent Chromium
EF-112A-40.0-44.0	JB61703-20A	Ground Water	Metals
EF-112A-6.0-6.5	JB61703-22	Soil	Hexavalent Chromium
EF-112A-6.0-6.5	JB61703-22A	Soil	Metals
EF-112A-8.0-8.5	JB61703-23	Soil	Hexavalent Chromium
EF-112A-8.0-8.5	JB61703-23A	Soil	Metals
FS-FB20140312 (Equipment Blank)	JB61703-25	Aqueous	Hexavalent Chromium
FS-FB20140312 (Equipment Blank)	JB61703-25A	Aqueous	Metals

The samples were collected following the procedures detailed in the Remedial Investigation Work Plan - Soil for Non-Residential Chromate Chemical Production Waste Sites 114, 132, 133, 135, 137, 143, and 186, Jersey City, New Jersey, or applicable proposal or work plan, and the Field Sampling Plan/Quality Assurance Project Plan for Non-Residential and Residential Chromium Sites Hudson County, New Jersey (December 2011).

General Comments

The data package was complete. Quality control (QC) issues identified during validation are discussed below. Refer to the Target Analyte Summary Hit(s) in Attachment A for a listing of all detected results, qualified results, and associated qualifications, where applicable. The nonconformances for each section discussed below are presented in Attachment B.

Hexavalent Chromium

Laboratory Blanks/Equipment Blanks

Method Blank

Negative drift for hexavalent chromium was detected in the continuing calibration blanks (CCBs) and the method blank, at comparable amounts, impacting all aqueous samples in this SDG. The positive and nondetect hexavalent chromium results for the equipment blank and groundwater samples were qualified as estimated (J/UJ).

MS Results

Sample EF-112A-10.0-14.0 (JB61703-2) was selected for the matrix spike (MS) analysis associated with the groundwater samples in this SDG and was used for supporting data quality recommendations. The MS recovery was 86.7%, which met the quality control (AC) criteria of 85-115%. No data qualification was required on the basis of spike recoveries.

Sample EF-112A-12.0-12.5 (JB61703-5) was selected for the MS analysis associated with the soil samples in this SDG and was used for supporting data quality recommendations. The soluble and insoluble MS recoveries were 92.9% and 90.6%, respectively; which met the QC criteria of 75-125%. The post digestion spike (PDS) recovery was 95.7%, which met the PDS criteria of 85-115%. No data qualification was required on the basis of spike recoveries.

Sample Results

Reported results (flagged B by the laboratory) that were less than the reporting limit (RL), but greater than or equal to the method detection limit (MDL) are approximate values and have been qualified as estimated (J).

Metals

Laboratory Blanks/Equipment Blanks

Method Blank

Chromium and nickel were detected in the method blank (MP78275-MB1) associated with all of the soil samples in this SDG, at concentrations above the MDLs, but below the RLs. Since the results for chromium and nickel in the associated soil samples were greater than ten times the amount detected in the method blank, no qualifications were required.

MS Results

MS/MSD analysis was performed on soil sample EF-112A-12.0-12.5 (JB61703-5A) in association with the Method 6010 analysis of the soil samples in this SDG.

The recoveries of antimony and chromium did not meet the QC criteria of 75-125%. The positive and nondetect results for antimony in all soil samples were qualified as estimated (J/UJ) with potential for low bias. No qualifications were required for chromium since the spiked sample concentration was greater than four times the matrix spike amount.

Sample Results

Reported results (flagged B by the laboratory) that were less than the RL, but greater than or equal to the MDL are approximate values that have been qualified as estimated (J).

Data Quality and Usability

In general, these data appear to be valid and may be used for decision-making purposes. No data were rejected. Qualified results, if applicable, are presented in Attachments A and B.

The hexavalent chromium results in all aqueous samples are usable as estimated values with potential low bias due to negative instrument drift.

Soil sample results for antimony qualified due to low MS recoveries are usable as estimated values with the potential for low bias.

Sample results reported between the MDL and RL are usable as estimated values with an unknown directional bias.

ATTACHMENTS

Attachment A: Target Analyte Summary Hitlist(s)

Attachment B: Data Validation Report Form

Attachment A

Target Analyte Summary Hitlist(s)

Soil Target Analyte Summary Hit List (Hexavalent Chromium)

Site Name PPG Garfield Avenue Supplemental Remedial Investigation (GARIS) Forrest Street
Sampling Date March 12, 2014
Lab Name/ID Accutest, Dayton, NJ
SDG No JB61703
Sample Matrix Soil
Trip Blank ID NA
Field Blank ID FS-FB20140312

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
EF-112A-10.0-10.5	JB61703-4	CHROMIUM (HEXAVALENT)	U	26.2	26.2	0.48		
EF-112A-12.0-12.5	JB61703-5	CHROMIUM (HEXAVALENT)	U	54.8	54.8	1.0		
EF-112A-14.0-14.5	JB61703-6	CHROMIUM (HEXAVALENT)	U	5.5	5.5	0.48		
EF-112A-14.0-14.5X	JB61703-7	CHROMIUM (HEXAVALENT)	U	5.4	5.4	0.47		
EF-112A-16.0-16.5	JB61703-8	CHROMIUM (HEXAVALENT)	U	6.6	6.6	0.45		
EF-112A-18.0-18.5	JB61703-9	CHROMIUM (HEXAVALENT)	U	29.6	29.6	0.47		
EF-112A-2.0-2.5	JB61703-1	CHROMIUM (HEXAVALENT)	U	25.6	25.6	0.47		
EF-112A-20.0-20.5	JB61703-10	CHROMIUM (HEXAVALENT)	U	19.8	19.8	0.46		
EF-112A-22.0-22.5	JB61703-11	CHROMIUM (HEXAVALENT)	U	22.6	22.6	0.46		
EF-112A-24.0-24.5	JB61703-12	CHROMIUM (HEXAVALENT)	U	14.0	14.0	0.46		
EF-112A-26.0-26.5	JB61703-13	CHROMIUM (HEXAVALENT)	U	86.8	86.8	0.97		
EF-112A-28.0-28.5	JB61703-14	CHROMIUM (HEXAVALENT)	U	33.2	33.2	0.48		
EF-112A-30.0-30.5	JB61703-24	CHROMIUM (HEXAVALENT)	U	17.0	17.0	0.50		
EF-112A-32.0-32.5	JB61703-16	CHROMIUM (HEXAVALENT)	U	7.4	7.4	0.50		
EF-112A-34.0-34.5	JB61703-17	CHROMIUM (HEXAVALENT)	U	4.1	4.1	0.48		
EF-112A-38.0-38.5	JB61703-19	CHROMIUM (HEXAVALENT)	U	0.17B	0.17	0.49	Qualify	31
EF-112A-4.0-4.5	JB61703-21	CHROMIUM (HEXAVALENT)	U	3.2	3.2	0.47		
EF-112A-6.0-6.5	JB61703-22	CHROMIUM (HEXAVALENT)	U	30.8	30.8	0.51		

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
EF-112A-8.0-8.5	JB61703-23	CHROMIUM (HEXAVALENT)	U	121	121	2.4		

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

NJDEP Laboratory Footnote

1. The value reported is less than or equal to 3x the value in the preparation/reagent blank. It is the policy of NJDEP-DPFSR to negate the reported value due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
2. The value reported is greater than three (3) times but less than ten (10) times the value in the preparation/reagent blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to the preparation/reagent blank contamination. The "B" qualifier alerts the end-user to the presence of this analyte in the preparation/reagent blank.
3. The value reported is less than or equal to three (3) times the value in the trip/field blank. It is the policy of NJDEP-DPFSR to negate the reported value as due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
4. The value reported is greater than three (3) times but less than ten (10) times the value in the trip/field blanks and is considered "real". However, the reported value must be quantitatively qualified "J" due to trip/field blank contamination.
5. The concentration reported by the laboratory is incorrectly calculated.
6. The laboratory failed to report the presence of the analyte in the sample.
7. The reported Hexavalent Chromium value was qualified because the Calibration Check Standard was not within the recovery range (90-110 percent).
8. In the Duplicate Sample Analysis, Hexavalent Chromium fell outside the control limits of ≤ 20 percent for sample results $> 4xRL$ or $+ RL$ for sample results $< 4xRL$. Therefore, the result was qualified.
9. This analyte was rejected because the laboratory performed the Duplicate Analysis on a field blank.

10. The reported value was qualified because the PVS recovery was greater than 115 percent.
11. The reported value was qualified because the PVS recovery was less than 85 percent.
12. The non-detected value was qualified (UJ) because the PVS recovery was less than 85 percent. The possibility of a false negative exists.
13. The reported analyte was qualified because the associated Calibration Blank result was greater than the MDL.
14. The laboratory made a transcription error. No hits were found in the raw data.
15. This analyte is qualified or rejected because the laboratory exceeded the holding time for digestion and/or analysis.
16. The laboratory subtracted the preparation/reagent blank from the sample result. The Reviewer's calculation puts the preparation/reagent blank back into the result.
17. The photocopy is unreadable. Therefore, the QA reviewer cannot read the laboratory's reported concentration result.
18. The reported value was qualified because the predigestion spike recovery was less than 75 %, but greater than 50%.
19. The reported value was qualified because the predigestion spike recovery was greater than 125 percent.
20. The non-detected value was qualified (UJ) because the redigestion spike recovery was less than 75 percent. The possibility of a false negative exists.
21. The reported result was qualified or rejected because the laboratory did not record the pH value(s) of the sample in a laboratory notebook.
22. The reported value was qualified (J/UJ) because the sample moisture content exceeded 50 percent.
23. The sample result was rejected because the soluble and insoluble matrix spike recoveries were less than 50%.
24. The detected sample result was qualified (J) because the incorrect spike concentration was used.
25. The reported sample results were rejected because the predigestion spike recovery was greater than 150 percent.

26. The reported sample results were rejected because the redigestion spike recovery was greater than 150 percent.
27. The reported value was qualified (J) because the redigestion spike recovery was less than 75 percent.
28. The reported value was qualified (J/UJ) because the sample digestion temperature was less than 90C.
29. In the Field Duplicate Sample Analysis, Hexavalent Chromium fell outside the control limits of $\leq 20\%$ for sample results $> 4xRL$ or $+ RL$ for sample results $< 4xRL$. Therefore, the result was qualified.
30. The reported value was qualified as estimated (J/UJ) but the bias is uncertain due to both high and low MS recoveries.
31. The reported result was greater than the MDL but less than the RL and qualified (J) as estimated by the laboratory.
32. The reported value was qualified because the sample replicate precision criterion of $\leq 20\%$ for method 7199 was exceeded.
33. The reported value was qualified (J/UJ) because the laboratory control sample (LCS) recovery was less than 80%.
34. The reported value was qualified (J) because the laboratory control sample (LCS) recovery was greater than 120%.
35. The reported result was qualified because the matrix spike analysis was not performed at the proper frequency.
36. The reported result was qualified because the laboratory duplicate analysis was not performed at the proper frequency.
37. The result was qualified because the cooler temperature upon sample receipt exceeded 6C.
38. The reported value was qualified because the redigestion spike recovery was greater than 125 percent.
39. The reported result was rejected because the laboratory failed to perform the reanalysis due to insufficient sample volume.
40. The reported results was qualified because the laboratory failed to analyze an ending CCB.
41. The reported result was qualified because the laboratory failed to make the proper method specific pH adjustment.
42. The reported result was rejected because the laboratory failed to reanalyze the MS and associated sample(s) due to failed MS recoveries.

43. The result was qualified due to negative instrument drift.

Aqueous Target Analyte Summary Hit List (Hexavalent Chromium)

Site Name PPG Garfield Avenue Supplemental Remedial Investigation (GARIS) Forrest Street
Sampling Date March 12, 2014
Lab Name/ID Accutest, Dayton, NJ
SDG No JB61703
Sample Matrix Groundwater
Trip Blank ID NA
Field Blank ID NA

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/L)	Laboratory Sample Result (mg/L)	Validation Sample Result (mg/L)	RL (mg/L)	Quality Assurance Decision	NJDEP Validation Footnote
EF-112A-10.0-14.0	JB61703-2	CHROMIUM (HEXAVALENT)	-0.003	U	U	0.010	Qualify	43
EF-112A-20.0-24.0	JB61703-3	CHROMIUM (HEXAVALENT)	-0.003	0.061	0.061	0.010	Qualify	43
EF-112A-30.0-34.0	JB61703-15	CHROMIUM (HEXAVALENT)	-0.003	0.66	0.66	0.010	Qualify	43
EF-112A-40.0-44.0	JB61703-20	CHROMIUM (HEXAVALENT)	-0.003	U	U	0.010	Qualify	43
FS-FB20140312	JB61703-25	CHROMIUM (HEXAVALENT)	-0.003	U	U	0.010	Qualify	43

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

NJDEP Laboratory Footnote

1. The value reported is less than or equal to 3x the value in the preparation/reagent blank. It is the policy of NJDEP-DPFSR to negate the reported value due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
2. The value reported is greater than three (3) times but less than ten (10) times the value in the preparation/reagent blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to the preparation/reagent blank contamination. The "B" qualifier alerts the end-user to the presence of this analyte in the preparation/reagent blank.
3. The value reported is less than or equal to three (3) times the value in the trip/field blank. It is the policy of NJDEP-DPFSR to negate the reported value as due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.

4. The value reported is greater than three (3) times but less than ten (10) times the value in the trip/field blanks and is considered "real". However, the reported value must be quantitatively qualified "J" due to trip/field blank contamination.
5. The concentration reported by the laboratory is incorrectly calculated.
6. The laboratory failed to report the presence of the analyte in the sample.
7. The reported Hexavalent Chromium value was qualified because the Calibration Check Standard was not within the recovery range (90-110 percent).
8. In the Duplicate Sample Analysis, Hexavalent Chromium fell outside the control limits of ≤ 20 percent for sample results $> 4xRL$ or $+ RL$ for sample results $< 4xRL$. Therefore, the result was qualified.
9. This analyte was rejected because the laboratory performed the Duplicate Analysis on a field blank.
10. The reported value was qualified because the PVS recovery was greater than 115 percent.
11. The reported value was qualified because the PVS recovery was less than 85 percent.
12. The non-detected value was qualified (UJ) because the PVS recovery was less than 85 percent. The possibility of a false negative exists.
13. The reported analyte was qualified because the associated Calibration Blank result was greater than the MDL.
14. The laboratory made a transcription error. No hits were found in the raw data.
15. This analyte is qualified or rejected because the laboratory exceeded the holding time for digestion and/or analysis.
16. The laboratory subtracted the preparation/reagent blank from the sample result. The Reviewer's calculation puts the preparation/reagent blank back into the result.
17. The photocopy is unreadable. Therefore, the QA reviewer cannot read the laboratory's reported concentration result.
18. The reported value was qualified because the predigestion spike recovery was less than 75 %, but greater than 50%.
19. The reported value was qualified because the predigestion spike recovery was greater than 125 percent.

20. The non-detected value was qualified (UJ) because the redigestion spike recovery was less than 75 percent. The possibility of a false negative exists.
21. The reported result was qualified or rejected because the laboratory did not record the pH value(s) of the sample in a laboratory notebook.
22. The reported value was qualified (J/UJ) because the sample moisture content exceeded 50 percent.
23. The sample result was rejected because the soluble and insoluble matrix spike recoveries were less than 50%.
24. The detected sample result was qualified (J) because the incorrect spike concentration was used.
25. The reported sample results were rejected because the predigestion spike recovery was greater than 150 percent.
26. The reported sample results were rejected because the redigestion spike recovery was greater than 150 percent.
27. The reported value was qualified (J) because the redigestion spike recovery was less than 75 percent.
28. The reported value was qualified (J/UJ) because the sample digestion temperature was less than 90C.
29. In the Field Duplicate Sample Analysis, Hexavalent Chromium fell outside the control limits of $\leq 20\%$ for sample results $> 4xRL$ or $+ RL$ for sample results $< 4xRL$. Therefore, the result was qualified.
30. The reported value was qualified as estimated (J/UJ) but the bias is uncertain due to both high and low MS recoveries.
31. The reported result was greater than the MDL but less than the RL and qualified (J) as estimated by the laboratory.
32. The reported value was qualified because the sample replicate precision criterion of $\leq 20\%$ for method 7199 was exceeded.
33. The reported value was qualified (J/UJ) because the laboratory control sample (LCS) recovery was less than 80%.
34. The reported value was qualified (J) because the laboratory control sample (LCS) recovery was greater than 120%.
35. The reported result was qualified because the matrix spike analysis was not performed at the proper frequency.

36. The reported result was qualified because the laboratory duplicate analysis was not performed at the proper frequency.
37. The result was qualified because the cooler temperature upon sample receipt exceeded 6C.
38. The reported value was qualified because the redigestion spike recovery was greater than 125 percent.
39. The reported result was rejected because the laboratory failed to perform the reanalysis due to insufficient sample volume.
40. The reported results was qualified because the laboratory failed to analyze an ending CCB.
41. The reported result was qualified because the laboratory failed to make the proper method specific pH adjustment.
42. The reported result was rejected because the laboratory failed to reanalyze the MS and associated sample(s) due to failed MS recoveries.
43. The result was qualified due to negative instrument drift.

Soil Target Analyte Summary Hit List (Metals)

Site Name PPG Garfield Avenue Supplemental Remedial Investigation (GARIS) Forrest Street
Sampling Date March 12, 2014
Lab Name/ID Accutest, Dayton, NJ
SDG No JB61703A
Sample Matrix Soil
Trip Blank ID NA
Field Blank ID FS-FB20140312

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
EF-112A-10.0-10.5	JB61703-4A	ANTIMONY	U	0.46B	0.46	2.3	Qualify	15,23
EF-112A-10.0-10.5	JB61703-4A	CHROMIUM	0.15	313	313	1.2		
EF-112A-10.0-10.5	JB61703-4A	NICKEL	0.19	10.6	10.6	4.6		
EF-112A-10.0-10.5	JB61703-4A	VANADIUM	U	19.8	19.8	5.8		
EF-112A-12.0-12.5	JB61703-5A	ANTIMONY	U	0.43B	0.43	2.6	Qualify	15,23
EF-112A-12.0-12.5	JB61703-5A	CHROMIUM	0.15	205	205	1.3		
EF-112A-12.0-12.5	JB61703-5A	NICKEL	0.19	12.2	12.2	5.2		
EF-112A-12.0-12.5	JB61703-5A	THALLIUM	U	0.50B	0.50	1.3	Qualify	23
EF-112A-12.0-12.5	JB61703-5A	VANADIUM	U	24.3	24.3	6.6		
EF-112A-14.0-14.5	JB61703-6A	ANTIMONY	U	U	U	2.5	Qualify	15
EF-112A-14.0-14.5	JB61703-6A	CHROMIUM	0.15	24.0	24.0	1.3		
EF-112A-14.0-14.5	JB61703-6A	NICKEL	0.19	6.1	6.1	5.0		
EF-112A-14.0-14.5	JB61703-6A	VANADIUM	U	12.8	12.8	6.3		
EF-112A-14.0-14.5X	JB61703-7A	ANTIMONY	U	U	U	2.3	Qualify	15
EF-112A-14.0-14.5X	JB61703-7A	CHROMIUM	0.15	24.5	24.5	1.2		
EF-112A-14.0-14.5X	JB61703-7A	NICKEL	0.19	5.8	5.8	4.6		
EF-112A-14.0-14.5X	JB61703-7A	VANADIUM	U	13.9	13.9	5.8		
EF-112A-16.0-16.5	JB61703-8A	ANTIMONY	U	U	U	2.3	Qualify	15

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
EF-112A-16.0-16.5	JB61703-8A	CHROMIUM	0.15	39.6	39.6	1.1		
EF-112A-16.0-16.5	JB61703-8A	NICKEL	0.19	16.6	16.6	4.5		
EF-112A-16.0-16.5	JB61703-8A	THALLIUM	U	0.33B	0.33	1.1	Qualify	23
EF-112A-16.0-16.5	JB61703-8A	VANADIUM	U	28.0	28.0	5.6		
EF-112A-18.0-18.5	JB61703-9A	ANTIMONY	U	0.41B	0.41	2.3	Qualify	15,23
EF-112A-18.0-18.5	JB61703-9A	CHROMIUM	0.15	55.8	55.8	1.2		
EF-112A-18.0-18.5	JB61703-9A	NICKEL	0.19	14.4	14.4	4.7		
EF-112A-18.0-18.5	JB61703-9A	VANADIUM	U	29.3	29.3	5.8		
EF-112A-2.0-2.5	JB61703-1A	NICKEL	0.19	316	316	4.5		
EF-112A-2.0-2.5	JB61703-1A	VANADIUM	U	236	236	5.7		
EF-112A-2.0-2.5	JB61703-1A	ANTIMONY	U	1.1B	1.1	4.5	Qualify	15,23
EF-112A-2.0-2.5	JB61703-1A	CHROMIUM	0.15	2560	2560	2.3		
EF-112A-2.0-2.5	JB61703-1A	THALLIUM	U	1.8B	1.8	2.3	Qualify	23
EF-112A-20.0-20.5	JB61703-10A	ANTIMONY	U	0.48B	0.48	2.3	Qualify	15,23
EF-112A-20.0-20.5	JB61703-10A	CHROMIUM	0.15	65.7	65.7	1.2		
EF-112A-20.0-20.5	JB61703-10A	NICKEL	0.19	12.6	12.6	4.6		
EF-112A-20.0-20.5	JB61703-10A	THALLIUM	U	0.38B	0.38	1.2	Qualify	23
EF-112A-20.0-20.5	JB61703-10A	VANADIUM	U	29.3	29.3	5.8		
EF-112A-22.0-22.5	JB61703-11A	ANTIMONY	U	U	U	2.4	Qualify	15
EF-112A-22.0-22.5	JB61703-11A	CHROMIUM	0.15	47.6	47.6	1.2		
EF-112A-22.0-22.5	JB61703-11A	NICKEL	0.19	9.4	9.4	4.8		
EF-112A-22.0-22.5	JB61703-11A	THALLIUM	U	0.43B	0.43	1.2	Qualify	23
EF-112A-22.0-22.5	JB61703-11A	VANADIUM	U	21.6	21.6	6.0		
EF-112A-24.0-24.5	JB61703-12A	ANTIMONY	U	0.90B	0.90	2.2	Qualify	15,23
EF-112A-24.0-24.5	JB61703-12A	CHROMIUM	0.15	86.0	86.0	1.1		

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
EF-112A-24.0-24.5	JB61703-12A	NICKEL	0.19	20.1	20.1	4.5		
EF-112A-24.0-24.5	JB61703-12A	VANADIUM	U	58.4	58.4	5.6		
EF-112A-26.0-26.5	JB61703-13A	ANTIMONY	U	U	U	2.5	Qualify	15
EF-112A-26.0-26.5	JB61703-13A	CHROMIUM	0.15	93.0	93.0	1.2		
EF-112A-26.0-26.5	JB61703-13A	NICKEL	0.19	5.3	5.3	4.9		
EF-112A-26.0-26.5	JB61703-13A	THALLIUM	U	0.46B	0.46	1.2	Qualify	23
EF-112A-26.0-26.5	JB61703-13A	VANADIUM	U	13.1	13.1	6.2		
EF-112A-28.0-28.5	JB61703-14A	ANTIMONY	U	U	U	2.4	Qualify	15
EF-112A-28.0-28.5	JB61703-14A	CHROMIUM	0.15	48.0	48.0	1.2		
EF-112A-28.0-28.5	JB61703-14A	NICKEL	0.19	4.7B	4.7	4.9	Qualify	23
EF-112A-28.0-28.5	JB61703-14A	VANADIUM	U	11.9	11.9	6.1		
EF-112A-30.0-30.5	JB61703-24A	ANTIMONY	U	U	U	2.5	Qualify	15
EF-112A-30.0-30.5	JB61703-24A	CHROMIUM	0.15	30.4	30.4	1.2		
EF-112A-30.0-30.5	JB61703-24A	NICKEL	0.19	5.9	5.9	5.0		
EF-112A-30.0-30.5	JB61703-24A	VANADIUM	U	12.2	12.2	6.2		
EF-112A-32.0-32.5	JB61703-16A	ANTIMONY	U	U	U	2.5	Qualify	15
EF-112A-32.0-32.5	JB61703-16A	CHROMIUM	0.15	17.5	17.5	1.2		
EF-112A-32.0-32.5	JB61703-16A	NICKEL	0.19	5.6	5.6	4.9		
EF-112A-32.0-32.5	JB61703-16A	VANADIUM	U	13.1	13.1	6.1		
EF-112A-34.0-34.5	JB61703-17A	ANTIMONY	U	U	U	2.3	Qualify	15
EF-112A-34.0-34.5	JB61703-17A	CHROMIUM	0.15	11.9	11.9	1.2		
EF-112A-34.0-34.5	JB61703-17A	NICKEL	0.19	4.2B	4.2	4.6	Qualify	23
EF-112A-34.0-34.5	JB61703-17A	VANADIUM	U	10.7	10.7	5.8		
EF-112A-36.0-36.5	JB61703-18A	ANTIMONY	U	U	U	2.5	Qualify	15
EF-112A-36.0-36.5	JB61703-18A	CHROMIUM	0.15	5.8	5.8	1.3		

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
EF-112A-36.0-36.5	JB61703-18A	NICKEL	0.19	3.6B	3.6	5.1	Qualify	23
EF-112A-36.0-36.5	JB61703-18A	VANADIUM	U	9.4	9.4	6.4		
EF-112A-38.0-38.5	JB61703-19A	ANTIMONY	U	U	U	2.4	Qualify	15
EF-112A-38.0-38.5	JB61703-19A	CHROMIUM	0.15	10.8	10.8	1.2		
EF-112A-38.0-38.5	JB61703-19A	NICKEL	0.19	8.3	8.3	4.7		
EF-112A-38.0-38.5	JB61703-19A	VANADIUM	U	15.6	15.6	5.9		
EF-112A-4.0-4.5	JB61703-21A	ANTIMONY	U	0.80B	0.80	2.5	Qualify	15,23
EF-112A-4.0-4.5	JB61703-21A	CHROMIUM	0.15	184	184	1.2		
EF-112A-4.0-4.5	JB61703-21A	NICKEL	0.19	15.5	15.5	4.9		
EF-112A-4.0-4.5	JB61703-21A	VANADIUM	U	14.0	14.0	6.2		
EF-112A-6.0-6.5	JB61703-22A	ANTIMONY	U	1.2B	1.2	2.7	Qualify	15,23
EF-112A-6.0-6.5	JB61703-22A	CHROMIUM	0.15	1010	1010	1.4		
EF-112A-6.0-6.5	JB61703-22A	NICKEL	0.19	17.0	17.0	5.4		
EF-112A-6.0-6.5	JB61703-22A	VANADIUM	U	19.1	19.1	6.8		
EF-112A-8.0-8.5	JB61703-23A	ANTIMONY	U	0.30B	0.30	2.3	Qualify	15,23
EF-112A-8.0-8.5	JB61703-23A	CHROMIUM	0.15	162	162	1.1		
EF-112A-8.0-8.5	JB61703-23A	NICKEL	0.19	12.1	12.1	4.6		
EF-112A-8.0-8.5	JB61703-23A	VANADIUM	U	22.0	22.0	5.7		

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

NJDEP Laboratory Footnote

1. The value reported is less than or equal to 3x the value in the method blank. It is the policy of NJDEP-DPFSR to negate the reported value due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.

2. The value reported is greater than three (3) but less than ten (10) times the value in the method blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to the method blank contamination. The "B" qualifier alerts the end-user to the presence of this analyte in the method blank.
3. The value reported is less than or equal to 3x the value in the trip/field blank. It is the policy of NJDEP-DPFSR to negate the reported value as due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
4. The value reported is greater than 3x but less than ten (10) the value in the trip/field blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to trip/field blank contamination.
5. The concentration reported by the laboratory is incorrectly calculated.
6. The laboratory failed to report the presence of the analyte in the sample.
7. The reported metal value was qualified because the Calibration Verification Standard was not within the recovery range (90-110 percent).
8. In the MS/MSD Sample Analysis, this analyte fell outside the control limits of 20% RPD. Therefore, the result was qualified.
9. This analyte was qualified because the laboratory performed the MS/MSD Analysis on a field blank.
10. The reported analyte was qualified because the associated Calibration Blank result was greater than the MDL.
11. The reported value was qualified because serial dilution analysis was not within QC limit of 10% D.
12. This analyte is rejected because the laboratory exceeded the holding time for digestion and analysis.
13. The laboratory subtracted the method blank from the sample result. The reviewer's calculation has added the method blank result to the reported concentration.
14. The photocopy submitted is illegible. Therefore, the QA reviewer cannot read the laboratory's reported concentration result.
15. The reported or nondetected value was qualified because the MS/MSD spike recovery was less than 75 percent.
16. The reported value was qualified because the MS/MSD spike recovery was greater than 125 percent.

17. The reported value was qualified as estimated (J/UJ) but the bias is uncertain due to both high and low MS recoveries.
18. The reported values were qualified because the laboratory duplicate exceeded 35 percent RPD for results greater than 5X the reporting limit or the absolute difference exceeded two times the reporting limit for sample result less than 5 times the reporting limit.
19. The reported value was qualified because the field duplicate exceeded 35 percent RPD for results greater than 5X the reporting limit or the absolute difference exceeded two times the reporting limit for sample result less than 5 times the reporting limit.
20. The reported value was qualified because the LCS recovery was less than 80 percent.
21. The reported value was qualified because the sample moisture content was greater than 50 percent.
22. The reported value was rejected because the field duplicate absolute difference was greater than 4 times the RL or the RPD was greater than 120%.
23. The reported result was greater than the MDL but less than the RL and qualified (J) as estimated by the laboratory.
24. The field duplicate absolute difference exceeded two times the reporting limit for sample result less than 5 times the reporting limit.
25. The reported value was qualified because the LCS recovery was greater than 120 percent.

Aqueous Target Analyte Summary Hit List (Metals)

Site Name PPG Garfield Avenue Supplemental Remedial Investigation (GARIS) Forrest Street
Sampling Date March 12, 2014
Lab Name/ID Accutest, Dayton, NJ
SDG No JB61703A
Sample Matrix Groundwater
Trip Blank ID NA
Field Blank ID NA

Field Sample ID	Lab Sample ID	Analyte	Method Blank (ug/L)	Laboratory Sample Result (ug/L)	Validation Sample Result (ug/L)	RL (ug/L)	Quality Assurance Decision	NJDEP Validation Footnote
EF-112A-10.0-14.0	JB61703-2A	CHROMIUM	U	845	845	10		
EF-112A-20.0-24.0	JB61703-3A	CHROMIUM	U	4440	4440	10		
EF-112A-30.0-34.0	JB61703-15A	CHROMIUM	U	9750	9750	50		
EF-112A-40.0-44.0	JB61703-20A	CHROMIUM	U	5700	5700	50		

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

NJDEP Laboratory Footnote

1. The value reported is less than or equal to 3x the value in the method blank. It is the policy of NJDEP-DPFSR to negate the reported value due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
2. The value reported is greater than three (3) but less than ten (10) times the value in the method blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to the method blank contamination. The "B" qualifier alerts the end-user to the presence of this analyte in the method blank.
3. The value reported is less than or equal to 3x the value in the trip/field blank. It is the policy of NJDEP-DPFSR to negate the reported value as due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
4. The value reported is greater than 3x but less than ten (10) the value in the trip/field blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to trip/field blank contamination.

5. The concentration reported by the laboratory is incorrectly calculated.
6. The laboratory failed to report the presence of the analyte in the sample.
7. The reported metal value was qualified because the Calibration Verification Standard was not within the recovery range (90-110 percent).
8. In the MS/MSD Sample Analysis, this analyte fell outside the control limits of 20% RPD. Therefore, the result was qualified.
9. This analyte was qualified because the laboratory performed the MS/MSD Analysis on a field blank.
10. The reported analyte was qualified because the associated Calibration Blank result was greater than the MDL.
11. The reported value was qualified because serial dilution analysis was not within QC limit of 10% D.
12. This analyte is rejected because the laboratory exceeded the holding time for digestion and analysis.
13. The laboratory subtracted the method blank from the sample result. The reviewer's calculation has added the method blank result to the reported concentration.
14. The photocopy submitted is illegible. Therefore, the QA reviewer cannot read the laboratory's reported concentration result.
15. The reported or nondetected value was qualified because the MS/MSD spike recovery was less than 75 percent.
16. The reported value was qualified because the MS/MSD spike recovery was greater than 125 percent.
17. The reported value was qualified as estimated (J/UJ) but the bias is uncertain due to both high and low MS recoveries.
18. The reported values were qualified because the laboratory duplicate exceeded 35 percent RPD for results greater than 5X the reporting limit or the absolute difference exceeded two times the reporting limit for sample result less than 5 times the reporting limit.
19. The reported value was qualified because the field duplicate exceeded 35 percent RPD for results greater than 5X the reporting limit or the absolute difference exceeded two times the reporting limit for sample result less than 5 times the reporting limit.
20. The reported value was qualified because the LCS recovery was less than 80 percent.
21. The reported value was qualified because the sample moisture content was greater than 50 percent.

22. The reported value was rejected because the field duplicate absolute difference was greater than 4 times the RL or the RPD was greater than 120%.
23. The reported result was greater than the MDL but less than the RL and qualified (J) as estimated by the laboratory.
24. The field duplicate absolute difference exceeded two times the reporting limit for sample result less than 5 times the reporting limit.
25. The reported value was qualified because the LCS recovery was greater than 120 percent.

Attachment B

Data Validation Report Form

Client Name: PPG Industries	Project Number: 60154801.6001A
Site Location: PPG Garfield Avenue Supplemental Remedial Investigation (GARIS) Forrest Street Groundwater and Soil, Jersey City, NJ	Project Manager: William Spronz
Laboratory: Accutest, Dayton, NJ	Type of Validation: Full
Laboratory Job No: JB61703	Date Checked: 5/19/14
Validator: Paula DiMattei	Peer: Lisa Krowitz

ITEM	YES	NO	N/A	COMMENTS
Sample results included?	X			
Reporting Limits met project requirements?	X			
Field I.D. included?	X			
Laboratory I.D. included?	X			
Sample matrix included?	X			
Sample receipt temperature 2-6C?	X			
Signed COCs included?	X			
Date of sample collection included?	X			
Date of sample digestion included?	X			
Holding time to digestion met criteria? (Soils -30 days from collection to digestion.)	X			
Date of analysis included?	X			
Holding time to analysis met criteria? (Soils -168 hours from digestion to analysis; Aqueous - 24 hours from collection to analysis.)	X			
Method reference included?	X			
Laboratory Case Narrative included?	X			

Definitions: MDL Method Detection Limit; %R Percent Recovery; RL Reporting Limit; RPD Relative Percent Difference; RSD Relative Standard Deviation :Corr Correlation Coefficient.

ITEM	YES	NO	N/A	COMMENTS
Initial calibration documentation included in lab package?	X			
1) Blank plus 4 standards (7196A) or blank plus 3 standards (7199)	X			
2) Correlation coefficient of =0.995 (7196A) or =0.999 (7199)	X			
3) Calibrate daily or each time instrument is set up.	X			
Calibration Check Standard (CCS) for 7196A and Quality Control Sample (QCS) for 7199 Included in Lab Package?	X			
1) %R criteria met? (90 - 110%)	X			
2) Correct frequency of one per every 10 samples	X			
3) CCS and QCS from independent source and at mid-level of calibration curve	X			
Calibration Blanks	X			
1) Analyzed prior to initial calibration standards and after each CCS/QCS?	X			
2) Absolute value should not exceed MDL.		X		see nonconformance table below
Method Blank, Field Blanks and/or Equipment Blanks Included in Lab Package?	X			FS-FB20140312
1) Method blank analyzed with each preparation batch?	X			
2) Absolute value should not exceed MDL.		X		see nonconformance table below
Eh and pH Data	X			
1) Eh and pH data was included and plotted for all samples?	X			
Soluble Matrix Spike Data Included in Lab Package?	X			Soil: EF-112A-12.0-12.5 and AQ: EF-112A-10.0-14.0
1) Soluble Matrix %R criteria met? (75-125%R).	X			
2) Was the spike concentration 40 mg/Kg or twice the sample concentration?	X			
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	X			
Insoluble Matrix Spike Data Included in Lab Package?	X			
1) Insoluble Matrix %R criteria met? (75-125%R).	X			
2) Was the spike concentration around 400 to 800 mg/Kg?		X		Spiked at 1320 mg/kg. No impact to data.
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	X			

ITEM	YES	NO	N/A	COMMENTS
Post Digestion Spike	X			
1) Post Digestion Spike %R criteria met? (85-115%R).	X			
2) Was the spike concentration 40 mg/Kg or twice the sample concentration?	X			
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	X			
Sample Duplicate Data Included in Lab Package?	X			Soil: EF-112A-12.0-12.5 and AQ: EF-112A-10.0-14.0
1) RPD criteria met? (RPD ≤20%) if both results are ≤4x RL or absolute difference ≤RL if either or both results are <4xRL.	X			
2) Was a sample duplicate analyzed at the frequency of 1 per batch or 20 samples?	X			
Was a Laboratory Control Sample (LCS) Included in Lab Package?	X			
1) %R criteria met? (80-120%R).	X			
2) Was an LCS analyzed at the frequency of 1/batch or 20 samples?	X			
Were any Field Duplicate samples submitted with this SDG?	X			EF-112A-14.0-14.5 and EF-112A-14.0-14.5X
1) Were Field duplicate RPD criteria met? (RPD≤20% for both sample results >4xRL or absolute difference ≤ RL if either or both results are <4xRL.	X			
Were all sample quantitation and reporting requirements met?	X			
1) Were all solid samples reported with percent solids > 50% ?	X			
2) Were any samples analyzed or reported with dilutions?	X			
Miscellaneous Items	X			
1) For soils by 7196A, was the pH within a range of 7.0-8.0?	X			
2) For soils by 7199, was the pH within a range of 9.0-9.5?			X	
3) For aqueous by 7196A, was the pH with a range of 1.5-2.5?	X			
4) For soils (3060A), was the digestion temperature 90-95C for at least 60 minutes?	X			
5) For 7199, was each sample injected twice and was the RPD =20?			X	

Laboratory Blanks

Blank ID	Analyte	Result	QL	Units	Associated Samples
GN1066-MB1	CHROMIUM (HEXAVALENT)	-0.003	0.01	mg/L	All aqueous samples

SDG#: JB61703
Batch: GN1243
 Cr+6 ICAL 03/19/14
 Soil
 (p. 103 of data pkg)

x - concentration	y - response
0	0
0.01	0.009
0.05	0.043
0.1	0.09
0.3	0.268
0.5	0.444
0.8	0.689
1	0.885

(p. 103 of data pkg)

AECOM Calculated Intercept	0.001	OK	Reported intercept	0.001
AECOM Slope	0.8768	OK	Reported Slope	0.8768
AECOM Calculated r	0.99983	OK	Reported r	0.99983

LCS calculation

GP78677-B1 p.103

Background Absorbance	0
Total absorbance	0.856
Total absorbance - background	0.856
Instrument Concentration	0.975
Sample weight (mg/kg)	0.0025
Final Volume (L)	0.1
Dilution Factor	1

AECOM Calculated LCS Result (mg/Kg)	39.0	OK	Reported Result (mg/Kg)	39.0
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%R = Found/True*100

p. 68

True Value (mg/kg)	40
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AECOM Calculated %R	97.5	OK	Reported %R	97.5
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MS calculation

JB61703-5 [EF-112A-12.0-12.5]p.103

Background reading	0
Total absorbance	0.435
Total absorbance - background	0.435
Instrument Concentration	0.4950
Sample weight (mg/kg)	0.00246
Final Volume (L)	0.1
Percent solids	0.803
Dilution Factor	50

AECOM Calculated MS Result (mg/Kg)	1250	OK	Reported Result (mg/Kg)	1250
------------------------------------	------	----	-------------------------	------

%R = Found/True*100

JB61703-5 [EF-112A-12.0-12.5]p.70

True Value (mg/kg)	1320
Native concentration (mg/Kg)	54.8

AECOM%R	90.8	OK rounding	Reported %R	90.6
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Percent Solids

JB61703-5 [EF-112A-12.0-12.5]p.71

Empty dish weight=	24.81
Wet weight=	30.34
Dry weight=	29.25

AECOM%solids =	80.3	OK	reported %solids=	80.3
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Reporting Limit			
JB61703-5 [EF-112A-12.0-12.5]p.18			
Low Standard	0.01		
Initial weight (mg/kg)	0.00244		
Final volume (L)	0.1		
Percent solids	0.803		
Dilution Factor	2		
Reporting Limit	1.0	OK	Reported RL (mg/Kg)= 1.0

Sample Calculations

JB61703-5 [EF-112A-12.0-12.5]p.18, 103			
Background reading	0		
Total absorbance	0.472		
Total absorbance - background	0.472		
Instrument Response	0.537		
Sample weight (mg/kg)	0.00244		
Final Volume (L)	0.1		
Percent solids	0.803		
Dilution Factor	2		
AECOM Calculated Result (mg/Kg)	54.8	OK	Reported Result (mg/Kg) 54.8

JB61703-1 [EF-112A-2.0-2.5]p.14, 103			
Background reading	0		
Total absorbance	0.485		
Total absorbance - background	0.485		
Instrument Response	0.552		
Sample weight (mg/kg)	0.00254		
Final Volume (L)	0.1		
Percent solids	0.85		
Dilution Factor	1		
AECOM Calculated Result (mg/Kg)	25.6	OK	Reported Result (mg/Kg) 25.6

JB61703-4 [EF-112A-10.0-10.5]p.17, 103			
Background reading	0		
Total absorbance	0.465		
Total absorbance - background	0.465		
Instrument Response	0.529		
Sample weight (mg/kg)	0.00241		
Final Volume (L)	0.1		
Percent solids	0.837		
Dilution Factor	1		
AECOM Calculated Result (mg/Kg)	26.2	OK	Reported Result (mg/Kg) 26.2

Client Name: PPG Industries	Project Number: 60154801.6001A
Site Location: PPG Garfield Avenue Supplemental Remedial Investigation (GARIS) Forrest Street Groundwater and Soil, Jersey City, NJ	Project Manager: William Spronz
Laboratory: Accutest, Dayton, NJ	Type of Validation: Limited
Laboratory Job No: JB61703A	Date Checked: 5/19/14
Validator: Paula DiMattei	Peer: Lisa Krowitz

ITEM	YES	NO	N/A	COMMENTS
Sample results included?	X			
Reporting Limits met project requirements?	X			
Field I.D. included?	X			
Laboratory I.D. included?	X			
Sample matrix included?	X			
Sample receipt temperature 2-6C?	X			
Signed COCs included?	X			
Date of sample collection included?	X			
Date of sample digestion included?	X			
Date of analysis included?	X			
Holding time met QC criteria? (Metals -180 days from sample collection; Mercury - 28 days from sample collection. If HT exceeded by 10 days R all results.	X			
Method reference included?	X			
Laboratory Case Narrative included?	X			

Definitions: MDL Method Detection Limit; %R Percent Recovery; RL Reporting Limit; RPD Relative Percent Difference; RSD Relative Standard Deviation ;Corr Correlation Coefficient.

ITEM	YES	NO	N/A	COMMENTS
Sample dilutions?	X			
Initial calibration documentation included in lab package?			X	NA for a Limited review
1) Calibrate daily or each time instrument is set up.			X	
2) ICP (6010) -Blank plus 1 standard? If no, reject (R) data.			X	
3) Hg (7470/7471) -Blank plus 5 standards? If no, reject (R) data.			X	
Initial Calibration Verification Standard (ICV) for ICP (6010) and Initial Calibration Check Standard (ICCS) for Hg (7470/7471) included in lab package?			X	
1) Analyzed immediately after initial calibration? If no, reject (R) data.			X	
2) %R criteria met? (90-110%). If no, J positive results for affected analyte(s) if %R between 80-89% and 111-120% and indicate bias; UJ non-detect results for affected analyte(s) if %R between 80-89% , and R all data for affected analyte(s) if %R 120%.			X	
3) Spot check ICV/ICCS results for several analytes.			X	
Continuing Calibration Verification Standard (CCV) for ICP (6010) and Calibration Check Standard (CCS) for Hg (7470/7471) included in Lab Package?			X	
1) Analyzed immediately after each ICV/ICC/CB and after every 10 samples? If no, reject (R) data.			X	
2) CCS and CCV from independent source and at mid-level of calibration curve. If no, reject (R) data.			X	
3) %R criteria met? (90-110%R). If no, J positive results for affected analyte(s) if %R between 80-89% and 111-120% and indicate bias; UJ non-detect results for affected analyte(s) if %R between 80-89% and R all data for affected analyte(s) if %R 120%.			X	
4) Spot check CCV/CCS results for several analytes.			X	
Low Calibration Standard (CRI) included in Lab Package?			X	
1) %R criteria met? - 50-150% for Co, Mn, Zn, by ICP-MS; Pb, Tl by 6010; 70-130% all others. If no, refer to ILM05.4 NJ SOP 5.A.2 for actions.			X	

ITEM	YES	NO	N/A	COMMENTS
Calibration Blanks			X	NA for a Limited review
1) Analyzed after daily calibration and after each ICV/ICC/CCV/CCS and after every 10 samples? If no, reject (R) data.			X	
2) Absolute value 10xCB result, no qualification.			X	
Method Blank Included in Lab Package?	X			
1) Method blank analyzed with each preparation batch or every SDG, or 1/20 samples? If no, reject (R) data, except no aqueous MB required for FB/EB if only soil samples were analyzed.	X			
2) Method blank analyzed 1/20 samples? If - MB 1/25, J sample results from 21-25; -MB >1/25, R sample results after 25th sample.	X			
3) MB results nondetect? If no, -sample result 3xMB but 10xMB, no qualification.		X		see nonconformance table below
4) Negative MB result reported? If yes, -Positive sample result		X		
Field Blanks/Equipment Blanks Included in Lab Package?	X			FS-FB20140312
1) FB/EB result non-detect? If no, -sample result 3xFB/EB but 10xFB/EB, no qualification.	X			
ICP Interference Check Sample (ICS) included in Lab Package?			X	NA for a Limited review
1) Analyzed at beginning of analytical run? If no, reject (R) data.			X	
2) %R criteria met? (80-120%) If no, %R>120%, no qualification if sample result non-detect; %R between 121-150%, J positive results, biased high; %R between 50-79%, J/UJ results, biased low; %R150%, reject (R) result			X	
3) Spot check accuracy of %Rs			X	
Matrix Spike/Matrix Spike Duplicate Data Included in Lab Package?	X			Soil: EF-112A-12.0-12.5 and AQ: Batch QC. (Batch QC was not assessed)
1) MS/MSD %R (75-125%R) and RPD (+20%) criteria met? - %R>125% J positive results for affected analyte(s) for all samples in the same batch/SDG, accept NDs; -%R		X		
2) Was a sample spiked at the frequency of 1/batch or 20 samples?	X			
3) Was the MS performed on a site sample?	X			
4) Was the MS performed on a FB/EB or TB? If yes, J all sample data.		X		

ITEM	YES	NO	N/A	COMMENTS
Post Digestion Spike			X	NA for a Limited review
1) %R criteria met? (75-125%R) - %R>125% J positive results for affected analyte(s) for all samples in the same batch/SDG, accept NDs.; - %R			X	
2) Was the spike performed on a FB/EB or TB? If yes, J all sample data.			X	
3) Was a sample spiked at the frequency of 1/batch or 20 samples?			X	
Laboratory Duplicate Data Included in Lab Package?		X		MS/MSD analyses were performed in lieu of a laboratory duplicate analysis.
Aqueous - If RPD is >20% but 5x the QL, estimate (J) results >the QL. - If RPD is >100%, reject R results >= the QL.- If sample and/or duplicate is the QL, estimate (J) positive results 2x the QL, reject R non-detects and positive results			X	
Soil - If RPD is >35% but 5x the QL, estimate (J) results > the QL. - If RPD is >120%, reject results > the QL. - If sample and/or duplicate is 2x the QL, estimate (J) positive results 4x the QL, reject nondetects and positive results			X	
Was a Laboratory Control Sample (LCS) Included in Lab Package?	X			
1) LCS %R criteria met? (80-120%R). If no, J/UJ all affected analytes(s) for all samples in the same batch/SDG.	X			
2) Was an LCS analyzed at the frequency of 1/batch or 20 samples? If no, J/UJ affected analyte(s) for all samples in the same batch/SDG.	X			
Serial Dilution			X	NA for a Limited review
1) %D(25xIDL (7000) or >10xIDL (6010) and %D >10% J positive results for affected analyte(s) for all samples in the same batch/SDG, accept NDs.			X	
2) Was the frequency 1/batch or 20 samples?			X	
3) Was a site sample used?			X	
4) Was a FB/EB or TB used? If yes, J all sample data.			X	
5) Spot check accuracy of %Ds.			X	

ITEM	YES	NO	N/A	COMMENTS
Field Duplicate Data included in Lab Package?	X			EF-112A-14.0-14.5 and EF112A-14.0-14.5X
Aqueous - If RPD is >20% but 5x the QL, estimate (J) results > the QL. - If RPD is >100%, reject R results >= the QL. - If sample and/or duplicate is the QL, estimate (J) positive results 2x the QL, reject R non-detects and positive results			X	
Soil - If RPD is >35% but 5x the QL, estimate (J) results > the QL. - If RPD is >120%, reject results > the QL. - If sample and/or duplicate is 2x the QL, estimate (J) positive results 4x the QL, reject nondetects and positive results	X			
Percent Solids data included in Lab Package?	X			
1) %Solids criteria (Reg 2 criteria) met? (>=50%)	X			

Laboratory Blanks

Blank ID	Analyte	Result	QL	Units	Associated Samples
MP78275-MB1	Chromium	0.15	0.99	mg/kg	All soil samples
	Nickel	0.19	4.0	mg/kg	

Matrix Spikes

Sample ID	Analyte	MS % Recovery	MSD % Recovery	Lower Limit	Upper Limit
EF-112A-12.0-12.5	ANTIMONY	55.0	54.6	75	125

Data Validation Report

Project:	PPG Garfield Avenue Supplemental Remedial Investigation (GARIS) Forrest Street Groundwater and Soil	
Laboratory:	Accutest, Dayton, NJ	
Laboratory Job No.:	JB62136, JB62136A and JB62136R	
Analysis/Method:	Hexavalent Chromium SW846 3060A/7196 Metals by ICP-AES/ SW846-6010	
Validation Level:	Full (Hexavalent Chromium) Limited (Metals)	
Site Location/Address:	Forrest Street, Jersey City, NJ	
AECOM Project No:	60154801.6001A	
Prepared by:	Paula DiMattei /AECOM	Completed on: 05/05/2014
Reviewed by:	Lisa Krowitz /AECOM	File Name: JB62136_A_R_2014-05-05_DV Report-F

Introduction

The data were reviewed in accordance with the FSP-QAPP and the following NJDEP validation Standard Operating Procedures (SOP):

- NJDEP Office of Data Quality SOP 5.A.10, Rev 3 (September 2009), SOP for Analytical Data Validation of Hexavalent Chromium - for USEPA SW-846 Method 3060A, USEPA SW-846 Method 7196A and USEPA SW-846 Method 7199;
- NJDEP Office of Data Quality SOP 5.A.16, Rev 1 (May 2002), Quality Assurance Data Validation of Analytical Deliverables for Inorganics (based on USEPA SW-846 Methods)

The results of quality control data analyzed with site samples were used to assess the overall reliability of the data. The following qualifiers were used to identify data quality issues:

- U: Indicates the analyte was not detected in the sample above the sample reporting limit.
- J: Indicates the result was an estimated value; the associated numerical value was an approximate concentration of the analyte in the sample.
- UJ: Indicates the analyte was not detected above the reporting limit and the reporting limit was approximate.
- R: The sample result was rejected due to serious deficiencies; the presence or absence of the analyte could not be confirmed.
- RA: The sample result was rejected but is still considered usable.

Sample Information

The samples listed below were collected by AECOM on March 17, 2014 as part of the PPG Garfield Avenue Supplemental Remedial Investigation (GARIS) Forrest Street Groundwater and Soil sampling at the PPG Forrest Street, Jersey City, NJ. Only the samples and parameters listed below were validated.

Field ID	Laboratory ID	Matrix	Fraction
FS18-0.0-0.5	JB62136-1	Soil	Hexavalent Chromium
FS18-0.0-0.5	JB62136-1A	Soil	Metals
FS18-0.0-0.5	JB62136-1R	Soil	Hexavalent Chromium
FS18-10.0-10.5	JB62136-21	Soil	Hexavalent Chromium
FS18-10.0-10.5	JB62136-21A	Soil	Metals
FS18-12.0-12.5	JB62136-22	Soil	Hexavalent Chromium
FS18-12.0-12.5	JB62136-22A	Soil	Metals
FS18-14.0-14.5	JB62136-23	Soil	Hexavalent Chromium
FS18-14.0-14.5	JB62136-23A	Soil	Metals
FS18-16.0-16.5	JB62136-8	Soil	Hexavalent Chromium
FS18-16.0-16.5	JB62136-8A	Soil	Metals
FS18-16.0-16.5	JB62136-8R	Soil	Hexavalent Chromium
FS18-18.0-18.5	JB62136-9	Soil	Hexavalent Chromium
FS18-18.0-18.5	JB62136-9A	Soil	Metals
FS18-18.0-18.5	JB62136-9R	Soil	Hexavalent Chromium
FS18-2.0-2.5	JB62136-2	Soil	Hexavalent Chromium
FS18-2.0-2.5	JB62136-2A	Soil	Metals
FS18-2.0-2.5	JB62136-2R	Soil	Hexavalent Chromium
FS18-20.0-20.5	JB62136-11	Soil	Hexavalent Chromium
FS18-20.0-20.5	JB62136-11A	Soil	Metals
FS18-20.0-20.5	JB62136-11R	Soil	Hexavalent Chromium
FS18-22.0-22.5	JB62136-12	Soil	Hexavalent Chromium
FS18-22.0-22.5	JB62136-12A	Soil	Metals
FS18-22.0-22.5	JB62136-12R	Soil	Hexavalent Chromium
FS18-24.0-24.5	JB62136-24	Soil	Hexavalent Chromium
FS18-24.0-24.5	JB62136-24A	Soil	Metals
FS18-26.0-26.5	JB62136-13	Soil	Hexavalent Chromium
FS18-26.0-26.5	JB62136-13A	Soil	Metals
FS18-26.0-26.5	JB62136-13R	Soil	Hexavalent Chromium
FS18-28.0-28.5	JB62136-14	Soil	Hexavalent Chromium
FS18-28.0-28.5	JB62136-14A	Soil	Metals
FS18-30.0-30.5	JB62136-16	Soil	Hexavalent Chromium
FS18-30.0-30.5	JB62136-16A	Soil	Metals
FS18-32.0-32.5	JB62136-17	Soil	Hexavalent Chromium
FS18-32.0-32.5	JB62136-17A	Soil	Metals

Field ID	Laboratory ID	Matrix	Fraction
FS18-34.0-34.5	JB62136-25	Soil	Hexavalent Chromium
FS18-34.0-34.5	JB62136-25A	Soil	Metals
FS18-36.0-36.5	JB62136-18	Soil	Hexavalent Chromium
FS18-36.0-36.5	JB62136-18A	Soil	Metals
FS18-38.0-38.5	JB62136-19	Soil	Hexavalent Chromium
FS18-38.0-38.5	JB62136-19A	Soil	Metals
FS18-4.0-4.5	JB62136-3	Soil	Hexavalent Chromium
FS18-4.0-4.5	JB62136-3A	Soil	Metals
FS18-4.0-4.5	JB62136-3R	Soil	Hexavalent Chromium
FS18-4.0-4.5X (Field Duplicate of FS18-4.0-4.5)	JB62136-4	Soil	Hexavalent Chromium
FS18-4.0-4.5X (Field Duplicate of FS18-4.0-4.5)	JB62136-4A	Soil	Metals
FS18-4.0-4.5X (Field Duplicate of FS18-4.0-4.5)	JB62136-4R	Soil	Hexavalent Chromium
FS18-6.0-6.5	JB62136-5	Soil	Hexavalent Chromium
FS18-6.0-6.5	JB62136-5A	Soil	Metals
FS18-6.0-6.5	JB62136-5R	Soil	Hexavalent Chromium
FS18-8.0-8.5	JB62136-6	Soil	Hexavalent Chromium
FS18-8.0-8.5	JB62136-6A	Soil	Metals
FS18-8.0-8.5	JB62136-6R	Soil	Hexavalent Chromium
FS18GW-10.0-14.0	JB62136-7	Ground Water	Hexavalent Chromium
FS18GW-10.0-14.0	JB62136-7A	Ground Water	Metals
FS18GW-20.0-24.0	JB62136-10	Ground Water	Hexavalent Chromium
FS18GW-20.0-24.0	JB62136-10A	Ground Water	Metals
FS18GW-30.0-34.0	JB62136-15	Ground Water	Hexavalent Chromium
FS18GW-30.0-34.0	JB62136-15A	Ground Water	Metals
FS18GW-40.0-44.0	JB62136-20	Ground Water	Hexavalent Chromium
FS18GW-40.0-44.0	JB62136-20A	Ground Water	Metals
FS-FB20140317 (Equipment Blank)	JB62136-26	Aqueous	Hexavalent Chromium
FS-FB20140317 (Equipment Blank)	JB62136-26A	Aqueous	Metals

The samples were collected following the procedures detailed in the Remedial Investigation Work Plan - Soil for Non-Residential Chromate Chemical Production Waste Sites 114, 132, 133, 135, 137, 143, and 186, Jersey City, New Jersey, or applicable proposal or work plan, and the Field Sampling Plan/Quality Assurance Project Plan for Non-Residential and Residential Chromium Sites Hudson County, New Jersey (December 2011).

General Comments

The data package was complete. Quality control (QC) issues identified during validation are discussed below. Refer to the Target Analyte Summary Hit(s) in Attachment A for a listing of all detected results, qualified results, and associated qualifications, where applicable. The nonconformances for each section discussed below are presented in Attachment B.

Hexavalent Chromium

MS Results

Sample FS18GW-20.0-24.0 (JB62136-10) was selected for the MS analysis associated with the groundwater samples in this SDG. The MS recovery was 50.0%, which did not meet the MS recovery criteria of 85-115%. The laboratory noted that a post digestion spike (PDS) was not analyzed. All groundwater samples were qualified as estimated (J).

There were two matrix spike (MS) samples associated with the soil samples in this SDG, that were used for supporting data quality recommendations: FS18-20.0-20.5 (JB62136-11) associated with samples in preparation batch GP78797 and FS18-28.0-28.5 (JB62136-14) associated with samples in preparation batch GP78798.

For MS on soil sample FS18-28.0-28.5, the soluble and insoluble matrix spike (MS) recoveries were 84.9% and 87.7%, respectively, which met the quality control (QC) criteria of 75-125%R. The PDS recovery was 88.7%, which met the PDS criteria of 85-115%.

For MS on soil sample FS18-20.0-20.5, the soluble and MS recoveries from the initial batch were 67.1% and 96.1%, respectively. The soluble MS recovery did not meet QC criteria of 75-125%R. The PDS recovery was 88.9%, which met the PDS criteria of 85-115%.

Based on poor MS recoveries, less than 75%R, the MS and associated samples were reanalyzed using Method 7196. The soluble and insoluble matrix spike recoveries from the re-analysis were 96.8% and 98.6% respectively, which met the QC criteria of 75-125%R. The PDS recovery was 96.4%, which met the PDS criteria of 85-115%.

Since the soluble MS recovery was outside the acceptable QC limit of 75-125% in the initial analysis, additional parameters were analyzed to determine if possible matrix interferences could be the cause for the poor matrix spike recoveries. All the soil samples were tested for pH and oxidation reduction potential (ORP) and plotted on an Eh/pH phase diagram chart. From this chart, the source sample for the matrix spike analysis was plotted slightly above the phase change line, indicating oxidizing potential with the sample matrix capable of supporting hexavalent chromium. Analyses for ferrous iron, sulfide screen, and total organic carbon (TOC) were performed on the MS source sample to confirm the oxidizing/reducing potential within the sample matrix. The sulfide screen was reported as nondetect, indicating no reducing agents within the sample matrix; however, the ferrous iron (0.29%) and the TOC results (863 mg/kg) were positive, indicating potential reducing agents within the sample matrix.

Although the MS recoveries in the initial analysis did not meet the MS QC requirements, the MS QC requirements were met in the re-analysis; therefore, the highest detected hexavalent chromium result was reported for each soil sample and qualification on the basis of spike recoveries was not required.

Sample Results

Reported results (flagged B by the laboratory) that were less than the reporting limit (RL), but greater than or equal to the method detection limit (MDL) are approximate values and have been qualified as estimated (J).

Metals

MS Results

Sample FS18-20.0-20.5 (JB62136-11A) was associated with the Method 6010 analysis of the soil samples in this SDG.

For the MS analysis on sample FS18-20.0-20.5, the recoveries of antimony and chromium, did not meet the QC criteria of 75-125%. The positive results for chromium in all soil samples were qualified as estimated (J) with a potential high bias. The positive and nondetect results for antimony in all soil samples were qualified as estimated (J/UJ) with a potential low bias.

Sample Results

Reported results (flagged B by the laboratory) that were less than the RL, but greater than or equal to the MDL, are approximate values that have been qualified as estimated (J).

Data Quality and Usability

In general, these data appear to be valid and may be used for decision-making purposes. No data were rejected. Qualified results, if applicable, are presented in Attachments A and B.

The groundwater hexavalent chromium results in this SDG are usable as estimated values with the potential for low bias due to the low MS recovery.

Sample results for chromium qualified due to a high MS recovery are usable as estimated values with the potential for high bias.

Sample results for antimony qualified due to a low MS recovery are usable as estimated values with the potential for low bias.

Sample results reported between the MDL and RL are usable as estimated values with an unknown directional bias.

ATTACHMENTS

Attachment A: Target Analyte Summary Hitlist(s)

Attachment B: Data Validation Report Form

Attachment A

Target Analyte Summary Hitlist(s)

Soil Target Analyte Summary Hit List (Hexavalent Chromium)

Site Name PPG Garfield Avenue Supplemental Remedial Investigation (GARIS) Forrest Street
Sampling Date March 17, 2014
Lab Name/ID Accutest, Dayton, NJ
SDG No JB62136 and JB62136R
Sample Matrix Soil
Trip Blank ID NA
Field Blank ID FS-FB20140317

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
FS18-10.0-10.5	JB62136-21	CHROMIUM (HEXAVALENT)	U	6.8	6.8	0.48		
FS18-12.0-12.5	JB62136-22	CHROMIUM (HEXAVALENT)	U	0.83	0.83	0.66		
FS18-24.0-24.5	JB62136-24	CHROMIUM (HEXAVALENT)	U	0.12B	0.12	0.46	Qualify	31
FS18-28.0-28.5	JB62136-14	CHROMIUM (HEXAVALENT)	U	0.13B	0.13	0.48	Qualify	31
FS18-30.0-30.5	JB62136-16	CHROMIUM (HEXAVALENT)	U	63.5	63.5	0.95		
FS18-32.0-32.5	JB62136-17	CHROMIUM (HEXAVALENT)	U	6.2	6.2	0.49		
FS18-0.0-0.5	JB62136-1R	CHROMIUM (HEXAVALENT)	U	65.6	65.6	0.87		
FS18-16.0-16.5	JB62136-8R	CHROMIUM (HEXAVALENT)	U	2.3	2.3	0.45		
FS18-18.0-18.5	JB62136-9R	CHROMIUM (HEXAVALENT)	U	1.7	1.7	0.46		
FS18-2.0-2.5	JB62136-2R	CHROMIUM (HEXAVALENT)	U	48.1	48.1	0.52		
FS18-20.0-20.5	JB62136-11R	CHROMIUM (HEXAVALENT)	U	8.8	8.8	0.46		
FS18-22.0-22.5	JB62136-12R	CHROMIUM (HEXAVALENT)	U	2.0	2.0	0.47		
FS18-26.0-26.5	JB62136-13R	CHROMIUM (HEXAVALENT)	U	1.9	1.9	0.46		
FS18-4.0-4.5	JB62136-3R	CHROMIUM (HEXAVALENT)	U	20.2	20.2	0.50		
FS18-4.0-4.5X	JB62136-4R	CHROMIUM (HEXAVALENT)	U	24.2	24.2	0.50		
FS18-6.0-6.5	JB62136-5R	CHROMIUM (HEXAVALENT)	U	6.9	6.9	0.48		
FS18-8.0-8.5	JB62136-6R	CHROMIUM (HEXAVALENT)	U	0.92	0.92	0.51		

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

NJDEP Laboratory Footnote

1. The value reported is less than or equal to 3x the value in the preparation/reagent blank. It is the policy of NJDEP-DPFSSR to negate the reported value due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
2. The value reported is greater than three (3) times but less than ten (10) times the value in the preparation/reagent blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to the preparation/reagent blank contamination. The "B" qualifier alerts the end-user to the presence of this analyte in the preparation/reagent blank.
3. The value reported is less than or equal to three (3) times the value in the trip/field blank. It is the policy of NJDEP-DPFSSR to negate the reported value as due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
4. The value reported is greater than three (3) times but less than ten (10) times the value in the trip/field blanks and is considered "real". However, the reported value must be quantitatively qualified "J" due to trip/field blank contamination.
5. The concentration reported by the laboratory is incorrectly calculated.
6. The laboratory failed to report the presence of the analyte in the sample.
7. The reported Hexavalent Chromium value was qualified because the Calibration Check Standard was not within the recovery range (90-110 percent).
8. In the Duplicate Sample Analysis, Hexavalent Chromium fell outside the control limits of ≤ 20 percent for sample results $> 4xRL$ or $+ RL$ for sample results $< 4xRL$. Therefore, the result was qualified.
9. This analyte was rejected because the laboratory performed the Duplicate Analysis on a field blank.
10. The reported value was qualified because the PVS recovery was greater than 115 percent.
11. The reported value was qualified because the PVS recovery was less than 85 percent.

12. The non-detected value was qualified (UJ) because the PVS recovery was less than 85 percent. The possibility of a false negative exists.
13. The reported analyte was qualified because the associated Calibration Blank result was greater than the MDL.
14. The laboratory made a transcription error. No hits were found in the raw data.
15. This analyte is qualified or rejected because the laboratory exceeded the holding time for digestion and/or analysis.
16. The laboratory subtracted the preparation/reagent blank from the sample result. The Reviewer's calculation puts the preparation/reagent blank back into the result.
17. The photocopy is unreadable. Therefore, the QA reviewer cannot read the laboratory's reported concentration result.
18. The reported value was qualified because the predigestion spike recovery was less than 75 %, but greater than 50%.
19. The reported value was qualified because the predigestion spike recovery was greater than 125 percent.
20. The non-detected value was qualified (UJ) because the redigestion spike recovery was less than 75 percent. The possibility of a false negative exists.
21. The reported result was qualified or rejected because the laboratory did not record the pH value(s) of the sample in a laboratory notebook.
22. The reported value was qualified (J/UJ) because the sample moisture content exceeded 50 percent.
23. The sample result was rejected because the soluble and insoluble matrix spike recoveries were less than 50%.
24. The detected sample result was qualified (J) because the incorrect spike concentration was used.
25. The reported sample results were rejected because the predigestion spike recovery was greater than 150 percent.
26. The reported sample results were rejected because the redigestion spike recovery was greater than 150 percent.
27. The reported value was qualified (J) because the redigestion spike recovery was less than 75 percent.

28. The reported value was qualified (J/UJ) because the sample digestion temperature was less than 90C.
29. In the Field Duplicate Sample Analysis, Hexavalent Chromium fell outside the control limits of $\leq 20\%$ for sample results $> 4xRL$ or $+ RL$ for sample results $< 4xRL$. Therefore, the result was qualified.
30. The reported value was qualified as estimated (J/UJ) but the bias is uncertain due to both high and low MS recoveries.
31. The reported result was greater than the MDL but less than the RL and qualified (J) as estimated by the laboratory.
32. The reported value was qualified because the sample replicate precision criterion of $\leq 20\%$ for method 7199 was exceeded.
33. The reported value was qualified (J/UJ) because the laboratory control sample (LCS) recovery was less than 80%.
34. The reported value was qualified (J) because the laboratory control sample (LCS) recovery was greater than 120%.
35. The reported result was qualified because the matrix spike analysis was not performed at the proper frequency.
36. The reported result was qualified because the laboratory duplicate analysis was not performed at the proper frequency.
37. The result was qualified because the cooler temperature upon sample receipt exceeded 6C.
38. The reported value was qualified because the redigestion spike recovery was greater than 125 percent.
39. The reported result was rejected because the laboratory failed to perform the reanalysis due to insufficient sample volume.
40. The reported results was qualified because the laboratory failed to analyze an ending CCB.
41. The reported result was qualified because the laboratory failed to make the proper method specific pH adjustment.
42. The reported result was rejected because the laboratory failed to reanalyze the MS and associated sample(s) due to failed MS recoveries.

Aqueous Target Analyte Summary Hit List (Hexavalent Chromium)

Site Name PPG Garfield Avenue Supplemental Remedial Investigation (GARIS) Forrest Street
Sampling Date March 17, 2014
Lab Name/ID Accutest, Dayton, NJ
SDG No JB62136
Sample Matrix Groundwater
Trip Blank ID NA
Field Blank ID NA

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/L)	Laboratory Sample Result (mg/L)	Validation Sample Result (mg/L)	RL (mg/L)	Quality Assurance Decision	NJDEP Validation Footnote
FS18GW-10.0-14.0	JB62136-7	CHROMIUM (HEXAVALENT)	U	5.9	5.9	0.25	Qualify	11
FS18GW-20.0-24.0	JB62136-10	CHROMIUM (HEXAVALENT)	U	2.7	2.7	0.25	Qualify	11
FS18GW-30.0-34.0	JB62136-15	CHROMIUM (HEXAVALENT)	U	5.7	5.7	0.25	Qualify	11
FS18GW-40.0-44.0	JB62136-20	CHROMIUM (HEXAVALENT)	U	2.9	2.9	0.25	Qualify	11

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

NJDEP Laboratory Footnote

1. The value reported is less than or equal to 3x the value in the preparation/reagent blank. It is the policy of NJDEP-DPFSR to negate the reported value due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
2. The value reported is greater than three (3) times but less than ten (10) times the value in the preparation/reagent blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to the preparation/reagent blank contamination. The "B" qualifier alerts the end-user to the presence of this analyte in the preparation/reagent blank.
3. The value reported is less than or equal to three (3) times the value in the trip/field blank. It is the policy of NJDEP-DPFSR to negate the reported value as due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.

4. The value reported is greater than three (3) times but less than ten (10) times the value in the trip/field blanks and is considered "real". However, the reported value must be quantitatively qualified "J" due to trip/field blank contamination.
5. The concentration reported by the laboratory is incorrectly calculated.
6. The laboratory failed to report the presence of the analyte in the sample.
7. The reported Hexavalent Chromium value was qualified because the Calibration Check Standard was not within the recovery range (90-110 percent).
8. In the Duplicate Sample Analysis, Hexavalent Chromium fell outside the control limits of ≤ 20 percent for sample results $> 4xRL$ or $+ RL$ for sample results $< 4xRL$. Therefore, the result was qualified.
9. This analyte was rejected because the laboratory performed the Duplicate Analysis on a field blank.
10. The reported value was qualified because the PVS recovery was greater than 115 percent.
11. The reported value was qualified because the PVS recovery was less than 85 percent.
12. The non-detected value was qualified (UJ) because the PVS recovery was less than 85 percent. The possibility of a false negative exists.
13. The reported analyte was qualified because the associated Calibration Blank result was greater than the MDL.
14. The laboratory made a transcription error. No hits were found in the raw data.
15. This analyte is qualified or rejected because the laboratory exceeded the holding time for digestion and/or analysis.
16. The laboratory subtracted the preparation/reagent blank from the sample result. The Reviewer's calculation puts the preparation/reagent blank back into the result.
17. The photocopy is unreadable. Therefore, the QA reviewer cannot read the laboratory's reported concentration result.
18. The reported value was qualified because the predigestion spike recovery was less than 75 %, but greater than 50%.
19. The reported value was qualified because the predigestion spike recovery was greater than 125 percent.

20. The non-detected value was qualified (UJ) because the redigestion spike recovery was less than 75 percent. The possibility of a false negative exists.
21. The reported result was qualified or rejected because the laboratory did not record the pH value(s) of the sample in a laboratory notebook.
22. The reported value was qualified (J/UJ) because the sample moisture content exceeded 50 percent.
23. The sample result was rejected because the soluble and insoluble matrix spike recoveries were less than 50%.
24. The detected sample result was qualified (J) because the incorrect spike concentration was used.
25. The reported sample results were rejected because the predigestion spike recovery was greater than 150 percent.
26. The reported sample results were rejected because the redigestion spike recovery was greater than 150 percent.
27. The reported value was qualified (J) because the redigestion spike recovery was less than 75 percent.
28. The reported value was qualified (J/UJ) because the sample digestion temperature was less than 90C.
29. In the Field Duplicate Sample Analysis, Hexavalent Chromium fell outside the control limits of $\leq 20\%$ for sample results $> 4xRL$ or $+ RL$ for sample results $< 4xRL$. Therefore, the result was qualified.
30. The reported value was qualified as estimated (J/UJ) but the bias is uncertain due to both high and low MS recoveries.
31. The reported result was greater than the MDL but less than the RL and qualified (J) as estimated by the laboratory.
32. The reported value was qualified because the sample replicate precision criterion of $\leq 20\%$ for method 7199 was exceeded.
33. The reported value was qualified (J/UJ) because the laboratory control sample (LCS) recovery was less than 80%.
34. The reported value was qualified (J) because the laboratory control sample (LCS) recovery was greater than 120%.
35. The reported result was qualified because the matrix spike analysis was not performed at the proper frequency.

36. The reported result was qualified because the laboratory duplicate analysis was not performed at the proper frequency.
37. The result was qualified because the cooler temperature upon sample receipt exceeded 6C.
38. The reported value was qualified because the redigestion spike recovery was greater than 125 percent.
39. The reported result was rejected because the laboratory failed to perform the reanalysis due to insufficient sample volume.
40. The reported results was qualified because the laboratory failed to analyze an ending CCB.
41. The reported result was qualified because the laboratory failed to make the proper method specific pH adjustment.
42. The reported result was rejected because the laboratory failed to reanalyze the MS and associated sample(s) due to failed MS recoveries.

Soil Target Analyte Summary Hit List (Metals)

Site Name PPG Garfield Avenue Supplemental Remedial Investigation (GARIS) Forrest Street
Sampling Date March 17, 2014
Lab Name/ID Accutest, Dayton, NJ
SDG No JB62136A
Sample Matrix Soil
Trip Blank ID NA
Field Blank ID FS-FB20140317

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
FS18-0.0-0.5	JB62136-1A	ANTIMONY	U	U		2.1	Qualify	15
FS18-0.0-0.5	JB62136-1A	CHROMIUM	U	247	247	1.1	Qualify	16
FS18-0.0-0.5	JB62136-1A	NICKEL	U	99.9	99.9	4.2		
FS18-0.0-0.5	JB62136-1A	VANADIUM	U	46.2	46.2	5.3		
FS18-10.0-10.5	JB62136-21A	ANTIMONY	U	U		2.3	Qualify	15
FS18-10.0-10.5	JB62136-21A	CHROMIUM	U	169	169	1.2	Qualify	16
FS18-10.0-10.5	JB62136-21A	NICKEL	U	16.5	16.5	4.7		
FS18-10.0-10.5	JB62136-21A	THALLIUM	U	0.53B	0.53	1.2	Qualify	23
FS18-10.0-10.5	JB62136-21A	VANADIUM	U	20.4	20.4	5.8		
FS18-12.0-12.5	JB62136-22A	ANTIMONY	U	3.1B	3.1	3.2	Qualify	15,23
FS18-12.0-12.5	JB62136-22A	CHROMIUM	U	3260	3260	1.6	Qualify	16
FS18-12.0-12.5	JB62136-22A	NICKEL	U	31.1	31.1	6.4		
FS18-12.0-12.5	JB62136-22A	VANADIUM	U	30.3	30.3	8.0		
FS18-14.0-14.5	JB62136-23A	ANTIMONY	U	U		2.3	Qualify	15
FS18-14.0-14.5	JB62136-23A	CHROMIUM	U	37.6	37.6	1.2	Qualify	16
FS18-14.0-14.5	JB62136-23A	NICKEL	U	9.6	9.6	4.6		
FS18-14.0-14.5	JB62136-23A	VANADIUM	U	23.2	23.2	5.8		

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
FS18-16.0-16.5	JB62136-8A	ANTIMONY	U	U		2.2	Qualify	15
FS18-16.0-16.5	JB62136-8A	CHROMIUM	U	36.2	36.2	1.1	Qualify	16
FS18-16.0-16.5	JB62136-8A	NICKEL	U	16.7	16.7	4.3		
FS18-16.0-16.5	JB62136-8A	VANADIUM	U	31.4	31.4	5.4		
FS18-18.0-18.5	JB62136-9A	ANTIMONY	U	U		2.3	Qualify	15
FS18-18.0-18.5	JB62136-9A	CHROMIUM	U	22.5	22.5	1.2	Qualify	16
FS18-18.0-18.5	JB62136-9A	NICKEL	U	15.6	15.6	4.7		
FS18-18.0-18.5	JB62136-9A	VANADIUM	U	31.2	31.2	5.8		
FS18-2.0-2.5	JB62136-2A	ANTIMONY	U	0.43B	0.43	2.7	Qualify	15,23
FS18-2.0-2.5	JB62136-2A	NICKEL	U	366	366	5.4		
FS18-2.0-2.5	JB62136-2A	VANADIUM	U	363	363	6.8		
FS18-2.0-2.5	JB62136-2A	CHROMIUM	U	4800	4800	2.7	Qualify	16
FS18-2.0-2.5	JB62136-2A	THALLIUM	U	2.6B	2.6	2.7	Qualify	23
FS18-20.0-20.5	JB62136-11A	ANTIMONY	U	U		2.4	Qualify	15
FS18-20.0-20.5	JB62136-11A	CHROMIUM	U	85.5	85.5	1.2	Qualify	16
FS18-20.0-20.5	JB62136-11A	NICKEL	U	14.5	14.5	4.8		
FS18-20.0-20.5	JB62136-11A	THALLIUM	U	0.68B	0.68	1.2	Qualify	23
FS18-20.0-20.5	JB62136-11A	VANADIUM	U	20.9	20.9	6.0		
FS18-22.0-22.5	JB62136-12A	ANTIMONY	U	U		2.4	Qualify	15
FS18-22.0-22.5	JB62136-12A	CHROMIUM	U	20.4	20.4	1.2	Qualify	16
FS18-22.0-22.5	JB62136-12A	NICKEL	U	5.5	5.5	4.8		
FS18-22.0-22.5	JB62136-12A	VANADIUM	U	11.9	11.9	6.0		
FS18-24.0-24.5	JB62136-24A	ANTIMONY	U	U		2.3	Qualify	15
FS18-24.0-24.5	JB62136-24A	CHROMIUM	U	15.0	15.0	1.2	Qualify	16
FS18-24.0-24.5	JB62136-24A	NICKEL	U	6.9	6.9	4.7		

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
FS18-24.0-24.5	JB62136-24A	VANADIUM	U	20.7	20.7	5.8		
FS18-26.0-26.5	JB62136-13A	ANTIMONY	U	U		2.3	Qualify	15
FS18-26.0-26.5	JB62136-13A	CHROMIUM	U	22.8	22.8	1.1	Qualify	16
FS18-26.0-26.5	JB62136-13A	NICKEL	U	5.9	5.9	4.6		
FS18-26.0-26.5	JB62136-13A	THALLIUM	U	0.50B	0.50	1.1	Qualify	23
FS18-26.0-26.5	JB62136-13A	VANADIUM	U	11.2	11.2	5.7		
FS18-28.0-28.5	JB62136-14A	ANTIMONY	U	U		2.3	Qualify	15
FS18-28.0-28.5	JB62136-14A	CHROMIUM	U	6.8	6.8	1.1	Qualify	16
FS18-28.0-28.5	JB62136-14A	NICKEL	U	4.0B	4.0	4.6	Qualify	23
FS18-28.0-28.5	JB62136-14A	VANADIUM	U	13.0	13.0	5.7		
FS18-30.0-30.5	JB62136-16A	ANTIMONY	U	U		2.4	Qualify	15
FS18-30.0-30.5	JB62136-16A	CHROMIUM	U	132	132	1.2	Qualify	16
FS18-30.0-30.5	JB62136-16A	NICKEL	U	8.5	8.5	4.7		
FS18-30.0-30.5	JB62136-16A	VANADIUM	U	14.7	14.7	5.9		
FS18-32.0-32.5	JB62136-17A	ANTIMONY	U	U		2.4	Qualify	15
FS18-32.0-32.5	JB62136-17A	CHROMIUM	U	26.8	26.8	1.2	Qualify	16
FS18-32.0-32.5	JB62136-17A	NICKEL	U	5.4	5.4	4.8		
FS18-32.0-32.5	JB62136-17A	VANADIUM	U	13.5	13.5	6.0		
FS18-34.0-34.5	JB62136-25A	ANTIMONY	U	U		2.5	Qualify	15
FS18-34.0-34.5	JB62136-25A	CHROMIUM	U	6.8	6.8	1.3	Qualify	16
FS18-34.0-34.5	JB62136-25A	NICKEL	U	3.7B	3.7	5.1	Qualify	23
FS18-34.0-34.5	JB62136-25A	VANADIUM	U	12.3	12.3	6.3		
FS18-36.0-36.5	JB62136-18A	ANTIMONY	U	U		2.6	Qualify	15
FS18-36.0-36.5	JB62136-18A	CHROMIUM	U	9.4	9.4	1.3	Qualify	16
FS18-36.0-36.5	JB62136-18A	NICKEL	U	7.1	7.1	5.1		

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
FS18-36.0-36.5	JB62136-18A	VANADIUM	U	13.1	13.1	6.4		
FS18-38.0-38.5	JB62136-19A	ANTIMONY	U	U		2.6	Qualify	15
FS18-38.0-38.5	JB62136-19A	CHROMIUM	U	8.7	8.7	1.3	Qualify	16
FS18-38.0-38.5	JB62136-19A	NICKEL	U	6.4	6.4	5.3		
FS18-38.0-38.5	JB62136-19A	VANADIUM	U	11.5	11.5	6.6		
FS18-4.0-4.5	JB62136-3A	ANTIMONY	U	U		2.4	Qualify	15
FS18-4.0-4.5	JB62136-3A	CHROMIUM	U	402	402	1.2	Qualify	16
FS18-4.0-4.5	JB62136-3A	NICKEL	U	17.1	17.1	4.7		
FS18-4.0-4.5	JB62136-3A	THALLIUM	U	0.53B	0.53	1.2	Qualify	23
FS18-4.0-4.5	JB62136-3A	VANADIUM	U	24.7	24.7	5.9		
FS18-4.0-4.5X	JB62136-4A	ANTIMONY	U	U		2.6	Qualify	15
FS18-4.0-4.5X	JB62136-4A	CHROMIUM	U	410	410	1.3	Qualify	16
FS18-4.0-4.5X	JB62136-4A	NICKEL	U	16.7	16.7	5.2		
FS18-4.0-4.5X	JB62136-4A	THALLIUM	U	0.63B	0.63	1.3	Qualify	23
FS18-4.0-4.5X	JB62136-4A	VANADIUM	U	27.0	27.0	6.6		
FS18-6.0-6.5	JB62136-5A	ANTIMONY	U	U		2.4	Qualify	15
FS18-6.0-6.5	JB62136-5A	CHROMIUM	U	92.5	92.5	1.2	Qualify	16
FS18-6.0-6.5	JB62136-5A	NICKEL	U	12.8	12.8	4.8		
FS18-6.0-6.5	JB62136-5A	VANADIUM	U	20.1	20.1	6.0		
FS18-8.0-8.5	JB62136-6A	ANTIMONY	U	U		2.6	Qualify	15
FS18-8.0-8.5	JB62136-6A	CHROMIUM	U	48.3	48.3	1.3	Qualify	16
FS18-8.0-8.5	JB62136-6A	NICKEL	U	8.7	8.7	5.2		
FS18-8.0-8.5	JB62136-6A	VANADIUM	U	18.8	18.8	6.5		

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

NJDEP Laboratory Footnote

1. The value reported is less than or equal to 3x the value in the method blank. It is the policy of NJDEP-DPF SR to negate the reported value due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
2. The value reported is greater than three (3) but less than ten (10) times the value in the method blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to the method blank contamination. The "B" qualifier alerts the end-user to the presence of this analyte in the method blank.
3. The value reported is less than or equal to 3x the value in the trip/field blank. It is the policy of NJDEP-DPF SR to negate the reported value as due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
4. The value reported is greater than 3x but less than ten (10) the value in the trip/field blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to trip/field blank contamination.
5. The concentration reported by the laboratory is incorrectly calculated.
6. The laboratory failed to report the presence of the analyte in the sample.
7. The reported metal value was qualified because the Calibration Verification Standard was not within the recovery range (90-110 percent).
8. In the MS/MSD Sample Analysis, this analyte fell outside the control limits of 20% RPD. Therefore, the result was qualified.
9. This analyte was qualified because the laboratory performed the MS/MSD Analysis on a field blank.
10. The reported analyte was qualified because the associated Calibration Blank result was greater than the MDL.
11. The reported value was qualified because serial dilution analysis was not within QC limit of 10% D.
12. This analyte is rejected because the laboratory exceeded the holding time for digestion and analysis.
13. The laboratory subtracted the method blank from the sample result. The reviewer's calculation has added the method blank result to the reported concentration.

14. The photocopy submitted is illegible. Therefore, the QA reviewer cannot read the laboratory's reported concentration result.
15. The reported or nondetected value was qualified because the MS/MSD spike recovery was less than 75 percent.
16. The reported value was qualified because the MS/MSD spike recovery was greater than 125 percent.
17. The reported value was qualified as estimated (J/UJ) but the bias is uncertain due to both high and low MS recoveries.
18. The reported values were qualified because the laboratory duplicate exceeded 35 percent RPD for results greater than 5X the reporting limit or the absolute difference exceeded two times the reporting limit for sample result less than 5 times the reporting limit.
19. The reported value was qualified because the field duplicate exceeded 35 percent RPD for results greater than 5X the reporting limit or the absolute difference exceeded two times the reporting limit for sample result less than 5 times the reporting limit.
20. The reported value was qualified because the LCS recovery was less than 80 percent.
21. The reported value was qualified because the sample moisture content was greater than 50 percent.
22. The reported value was rejected because the field duplicate absolute difference was greater than 4 times the RL or the RPD was greater than 120%.
23. The reported result was greater than the MDL but less than the RL and qualified (J) as estimated by the laboratory.
24. The field duplicate absolute difference exceeded two times the reporting limit for sample result less than 5 times the reporting limit.
25. The reported value was qualified because the LCS recovery was greater than 120 percent.

Aqueous Target Analyte Summary Hit List (Metals)

Site Name PPG Garfield Avenue Supplemental Remedial Investigation (GARIS) Forrest Street
Sampling Date March 17, 2014
Lab Name/ID Accutest, Dayton, NJ
SDG No JB62136A
Sample Matrix Groundwater
Trip Blank ID NA
Field Blank ID NA

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (ug/L)	Validation Sample Result (ug/L)	RL (ug/L)	Quality Assurance Decision	NJDEP Validation Footnote
FS-FB20140317	JB62136-26A	CHROMIUM	U	2.0B	2.0	10	Qualify	23
FS18GW-10.0-14.0	JB62136-7A	CHROMIUM	U	34400	34400	100		
FS18GW-20.0-24.0	JB62136-10A	CHROMIUM	U	33900	33900	100		
FS18GW-30.0-34.0	JB62136-15A	CHROMIUM	U	53600	53600	100		
FS18GW-40.0-44.0	JB62136-20A	CHROMIUM	U	29700	29700	100		

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

NJDEP Laboratory Footnote

1. The value reported is less than or equal to 3x the value in the method blank. It is the policy of NJDEP-DPFSR to negate the reported value due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
2. The value reported is greater than three (3) but less than ten (10) times the value in the method blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to the method blank contamination. The "B" qualifier alerts the end-user to the presence of this analyte in the method blank.
3. The value reported is less than or equal to 3x the value in the trip/field blank. It is the policy of NJDEP-DPFSR to negate the reported value as due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.

4. The value reported is greater than 3x but less than ten (10) the value in the trip/field blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to trip/field blank contamination.
5. The concentration reported by the laboratory is incorrectly calculated.
6. The laboratory failed to report the presence of the analyte in the sample.
7. The reported metal value was qualified because the Calibration Verification Standard was not within the recovery range (90-110 percent).
8. In the MS/MSD Sample Analysis, this analyte fell outside the control limits of 20% RPD. Therefore, the result was qualified.
9. This analyte was qualified because the laboratory performed the MS/MSD Analysis on a field blank.
10. The reported analyte was qualified because the associated Calibration Blank result was greater than the MDL.
11. The reported value was qualified because serial dilution analysis was not within QC limit of 10% D.
12. This analyte is rejected because the laboratory exceeded the holding time for digestion and analysis.
13. The laboratory subtracted the method blank from the sample result. The reviewer's calculation has added the method blank result to the reported concentration.
14. The photocopy submitted is illegible. Therefore, the QA reviewer cannot read the laboratory's reported concentration result.
15. The reported or nondetected value was qualified because the MS/MSD spike recovery was less than 75 percent.
16. The reported value was qualified because the MS/MSD spike recovery was greater than 125 percent.
17. The reported value was qualified as estimated (J/UJ) but the bias is uncertain due to both high and low MS recoveries.
18. The reported values were qualified because the laboratory duplicate exceeded 35 percent RPD for results greater than 5X the reporting limit or the absolute difference exceeded two times the reporting limit for sample result less than 5 times the reporting limit.
19. The reported value was qualified because the field duplicate exceeded 35 percent RPD for results greater than 5X the reporting limit or the absolute difference exceeded two times the reporting limit for sample result less than 5 times the reporting limit.

20. The reported value was qualified because the LCS recovery was less than 80 percent.
21. The reported value was qualified because the sample moisture content was greater than 50 percent.
22. The reported value was rejected because the field duplicate absolute difference was greater than 4 times the RL or the RPD was greater than 120%.
23. The reported result was greater than the MDL but less than the RL and qualified (J) as estimated by the laboratory.
24. The field duplicate absolute difference exceeded two times the reporting limit for sample result less than 5 times the reporting limit.
25. The reported value was qualified because the LCS recovery was greater than 120 percent.

Attachment B

Data Validation Report Form

Client Name: PPG Industries	Project Number: 60154801.6001A
Site Location: PPG Garfield Avenue Supplemental Remedial Investigation (GARIS) Forrest Street Groundwater and Soil, Jersey City, NJ	Project Manager: William Spronz
Laboratory: Accutest, Dayton, NJ	Type of Validation: Full
Laboratory Job No: JB62136 and JB62136R	Date Checked: 5/5/14
Validator: Paula DiMattei	Peer: Lisa Krowitz

ITEM	YES	NO	N/A	COMMENTS
Sample results included?	X			
Reporting Limits met project requirements?	X			
Field I.D. included?	X			
Laboratory I.D. included?	X			
Sample matrix included?	X			
Sample receipt temperature 2-6C?	X			
Signed COCs included?	X			
Date of sample collection included?	X			
Date of sample digestion included?	X			
Holding time to digestion met criteria? (Soils -30 days from collection to digestion.)	X			
Date of analysis included?	X			
Holding time to analysis met criteria? (Soils -168 hours from digestion to analysis; Aqueous - 24 hours from collection to analysis.)	X			
Method reference included?	X			
Laboratory Case Narrative included?	X			

Definitions: MDL Method Detection Limit; %R Percent Recovery; RL Reporting Limit; RPD Relative Percent Difference; RSD Relative Standard Deviation :Corr Correlation Coefficient.

ITEM	YES	NO	N/A	COMMENTS
Initial calibration documentation included in lab package?	X			
1) Blank plus 4 standards (7196A) or blank plus 3 standards (7199)	X			
2) Correlation coefficient of =0.995 (7196A) or =0.999 (7199)	X			
3) Calibrate daily or each time instrument is set up.	X			
Calibration Check Standard (CCS) for 7196A and Quality Control Sample (QCS) for 7199 Included in Lab Package?	X			
1) %R criteria met? (90 - 110%)	X			
2) Correct frequency of one per every 10 samples	X			
3) CCS and QCS from independent source and at mid-level of calibration curve	X			
Calibration Blanks	X			
1) Analyzed prior to initial calibration standards and after each CCS/QCS?	X			
2) Absolute value should not exceed MDL.	X			
Method Blank, Field Blanks and/or Equipment Blanks Included in Lab Package?	X			FS-FB20140317
1) Method blank analyzed with each preparation batch?	X			
2) Absolute value should not exceed MDL.	X			
Eh and pH Data	X			
1) Eh and pH data was included and plotted for all samples?	X			
Soluble Matrix Spike Data Included in Lab Package?	X			
1) Soluble Matrix %R criteria met? (75-125%R).		X		See nonconformance table below.
2) Was the spike concentration 40 mg/Kg or twice the sample concentration?	X			
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	X			
Insoluble Matrix Spike Data Included in Lab Package?	X			
1) Insoluble Matrix %R criteria met? (75-125%R).	X			
2) Was the spike concentration around 400 to 800 mg/Kg?		X		Spiked at 1310 mg/kg, 1120 mg/kg, and 1230 mg/kg. Data not impacted.
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	X			

ITEM	YES	NO	N/A	COMMENTS
Post Digestion Spike	X			
1) Post Digestion Spike %R criteria met? (85-115%R).	X			
2) Was the spike concentration 40 mg/Kg or twice the sample concentration?	X			
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	X			
Sample Duplicate Data Included in Lab Package?	X			Soil: FS18-20.0-20.5 and FS18-28.0-26.5. AQ:FS18GW-20.0-24.0
1) RPD criteria met? (RPD ≤20%) if both results are ≤4x RL or absolute difference ≤RL if either or both results are <4xRL.	X			
2) Was a sample duplicate analyzed at the frequency of 1 per batch or 20 samples?	X			
Was a Laboratory Control Sample (LCS) Included in Lab Package?	X			
1) %R criteria met? (80-120%R).	X			
2) Was an LCS analyzed at the frequency of 1/batch or 20 samples?	X			
Were any Field Duplicate samples submitted with this SDG?	X			FS18-4.0-4.5 and FS18-4.0-4.5X
1) Were Field duplicate RPD criteria met? (RPD≤20% for both sample results >4xRL or absolute difference ≤ RL if either or both results are <4xRL.	X			
Were all sample quantitation and reporting requirements met?	X			
1) Were all solid samples reported with percent solids > 50% ?	X			
2) Were any samples analyzed or reported with dilutions?	X			
Miscellaneous Items	X			
1) For soils by 7196A, was the pH within a range of 7.0-8.0?	X			
2) For soils by 7199, was the pH within a range of 9.0-9.5?			X	
3) For aqueous by 7196A, was the pH with a range of 1.5-2.5?	X			
4) For soils (3060A), was the digestion temperature 90-95C for at least 60 minutes?	X			
5) For 7199, was each sample injected twice and was the RPD =20?			X	

Matrix Spikes

Sample ID	Analyte	Analysis Batch	MS % Recovery	Lower Limit	Upper Limit
FS18GW-20.0-24.0	CHROMIUM (HEXAVALENT)	GN1374	50	85	115

Sample ID	Analyte	Analysis Batch	Matrix Spike	% Recovery	Lower Limit	Upper Limit	PDS	PDS Limit
FS18-28.0-28.5	CHROMIUM (HEXAVALENT)	GP78798/GN1771	Soluble	84.9	75	125	88.9	85-115
FS18-28.0-28.5	CHROMIUM (HEXAVALENT)	GP78798/GN1771	Insoluble	87.7	75	125		
FS-20.0-20.5	CHROMIUM (HEXAVALENT)	GP78797/GN1763	Soluble	67.1	75	125	88.7	85-115
FS-20.0-20.5	CHROMIUM (HEXAVALENT)	GP78797/GN1763	Insoluble	96.1	75	125		
FS-20.0-20.5	CHROMIUM (HEXAVALENT)	GP78797/GN1763	Soluble	96.8	75	125	96.4	85-115
FS-20.0-20.5	CHROMIUM (HEXAVALENT)	GP78797/GN1763	Insoluble	98.6	75	125		

SDG#: JB62136
Batch: GN1763
 Cr+6 ICAL 03/23/14
 Soil
 (p. 91 of data pkg)

x - concentration	y - response
0	0
0.01	0.009
0.05	0.044
0.1	0.091
0.3	0.279
0.5	0.449
0.8	0.709
1	0.899

(p. 91 of data pkg)

AECOM Calculated Intercept	0.0015	OK	Reported intercept	0.0015
AECOM Slope	0.8941	OK	Reported Slope	0.8941
AECOM Calculated r	0.99990	OK	Reported r	0.99990

GP78797-B1
p.91

LCS calculation

Background Absorbance	0
Total absorbance	0.768
Total absorbance - background	0.768
Instrument Concentration	0.857
Sample weight (mg/kg)	0.0025
Final Volume (L)	0.1
Dilution Factor	1

AECOM Calculated LCS Result (mg/Kg)	34.3	OK	Reported Result (mg/Kg)	34.3
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%R = Found/True*100

p. 65

True Value (mg/kg)	40
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AECOM Calculated %R	85.7	OK rounding	Reported %R	85.8
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MS calculation

JB62136-11 [FS18-20.0-20.5]p.91

Background reading	0
Total absorbance	0.496
Total absorbance - background	0.496
Instrument Concentration	0.5530
Sample weight (mg/kg)	0.00248
Final Volume (L)	0.1
Percent solids	0.875
Dilution Factor	50

AECOM Calculated MS Result (mg/Kg)	1270	OK	Reported Result (mg/Kg)	1270
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%R = Found/True*100

JB62136-11 [FS18-20.0-20.5]p.67

True Value (mg/kg)	1310
Native concentration (mg/Kg)	7.6

AECOM%R	96.7	OK rounding	Reported %R	96.1
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Percent Solids

JB62136-11 [FS18-20.0-20.5]p.69

Empty dish weight=	27.48
Wet weight=	37.08
Dry weight=	35.88

AECOM%solids =	87.5	OK	reported %solids=	87.5
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Reporting Limit

JB62136-11 [FS18-20.0-20.5]p.23

Low Standard	0.01
Initial weight (mg/kg)	0.00252
Final volume (L)	0.1
Percent solids	0.875
Dilution Factor	1

Reporting Limit	0.45	OK rounding	Reported RL (mg/Kg)=	0.46
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Sample Calculations

JB62136-11 [FS18-20.0-20.5]p.23, 91

Background reading	0
Total absorbance	0.151
Total absorbance - background	0.151
Instrument Response	0.167
Sample weight (mg/kg)	0.00252
Final Volume (L)	0.1
Percent solids	0.875
Dilution Factor	1

AECOM Calculated Result (mg/Kg)	7.6	OK	Reported Result (mg/Kg)	7.6
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SDG#: JB62136R

Batch: GN2113

Cr+6 ICAL 03/28/14

Soil

(p. 83 of data pkg)

x - concentration	y - response
0	0
0.01	0.009
0.05	0.044
0.1	0.09
0.3	0.269
0.5	0.443
0.8	0.689
1	0.898

(p. 83 of data pkg)

AECOM Calculated Intercept	0.0001	OK	Reported intercept	0.0001
AECOM Slope	0.8845	OK	Reported Slope	0.8845
AECOM Calculated r	0.99967	OK	Reported r	0.99967

Sample Calculations

JB62136-11R [FS18-20.0-20.5]p.17, 83

Background reading	0
Total absorbance	0.169
Total absorbance - background	0.169
Instrument Response	0.191
Sample weight (mg/kg)	0.00249
Final Volume (L)	0.1
Percent solids	0.875
Dilution Factor	1

AECOM Calculated Result (mg/Kg)	8.8	OK	Reported Result (mg/Kg)	8.8
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JB62136-2R [FS18-2.0-2.5]p.10, 83

Background reading	0.001
Total absorbance	0.846
Total absorbance - background	0.845
Instrument Response	0.955
Sample weight (mg/kg)	0.00258
Final Volume (L)	0.1
Percent solids	0.769
Dilution Factor	1

AECOM Calculated Result (mg/Kg)	48.1	OK	Reported Result (mg/Kg)	48.1
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Client Name: PPG Industries	Project Number: 60154801.6001A
Site Location: PPG Garfield Avenue Supplemental Remedial Investigation (GARIS) Forrest Street Groundwater and Soil, Jersey City, NJ	Project Manager: William Spronz
Laboratory: Accutest, Dayton, NJ	Type of Validation: Limited
Laboratory Job No: JB62136A	Date Checked: 5/5/14
Validator: Paula DiMattei	Peer: Lisa Krowitz

ITEM	YES	NO	N/A	COMMENTS
Sample results included?	X			
Reporting Limits met project requirements?	X			
Field I.D. included?	X			
Laboratory I.D. included?	X			
Sample matrix included?	X			
Sample receipt temperature 2-6C?	X			
Signed COCs included?	X			
Date of sample collection included?	X			
Date of sample digestion included?	X			
Date of analysis included?	X			
Holding time met QC criteria? (Metals -180 days from sample collection; Mercury - 28 days from sample collection. If HT exceeded by 10 days R all results.	X			
Method reference included?	X			
Laboratory Case Narrative included?	X			

Definitions: MDL Method Detection Limit; %R Percent Recovery; RL Reporting Limit; RPD Relative Percent Difference; RSD Relative Standard Deviation :Corr Correlation Coefficient.

ITEM	YES	NO	N/A	COMMENTS
Sample dilutions?	X			
Initial calibration documentation included in lab package?			X	NA for a Limited review.
1) Calibrate daily or each time instrument is set up.			X	
2) ICP (6010) -Blank plus 1 standard? If no, reject (R) data.			X	
3) Hg (7470/7471) -Blank plus 5 standards? If no, reject (R) data.			X	
Initial Calibration Verification Standard (ICV) for ICP (6010) and Initial Calibration Check Standard (ICCS) for Hg (7470/7471) included in lab package?			X	
1) Analyzed immediately after initial calibration? If no, reject (R) data.			X	
2) %R criteria met? (90-110%). If no, J positive results for affected analyte(s) if %R between 80-89% and 111-120% and indicate bias; UJ non-detect results for affected analyte(s) if %R between 80-89% , and R all data for affected analyte(s) if %R 120%.			X	
3) Spot check ICV/ICCS results for several analytes.			X	
Continuing Calibration Verification Standard (CCV) for ICP (6010) and Calibration Check Standard (CCS) for Hg (7470/7471) included in Lab Package?			X	
1) Analyzed immediately after each ICV/ICC/CB and after every 10 samples? If no, reject (R) data.			X	
2) CCS and CCV from independent source and at mid-level of calibration curve. If no, reject (R) data.			X	
3) %R criteria met? (90-110%R). If no, J positive results for affected analyte(s) if %R between 80-89% and 111-120% and indicate bias; UJ non-detect results for affected analyte(s) if %R between 80-89% and R all data for affected analyte(s) if %R 120%.			X	
4) Spot check CCV/CCS results for several analytes.			X	
Low Calibration Standard (CRI) included in Lab Package?			X	
1) %R criteria met? - 50-150% for Co, Mn, Zn, by ICP-MS; Pb, Tl by 6010; 70-130% all others. If no, refer to ILM05.4 NJ SOP 5.A.2 for actions.			X	

ITEM	YES	NO	N/A	COMMENTS
Calibration Blanks			X	
1) Analyzed after daily calibration and after each ICV/ICC/CCV/CCS and after every 10 samples? If no, reject (R) data.			X	
2) Absolute value 10xCB result, no qualification.			X	
Method Blank Included in Lab Package?	X			
1) Method blank analyzed with each preparation batch or every SDG, or 1/20 samples? If no, reject (R) data, except no aqueous MB required for FB/EB if only soil samples were analyzed.	X			
2) Method blank analyzed 1/20 samples? If - MB 1/25, J sample results from 21-25; -MB >1/25, R sample results after 25th sample.	X			
3) MB results nondetect? If no, -sample result 3xMB but 10xMB, no qualification.	X			
4) Negative MB result reported? If yes, -Positive sample result		X		
Field Blanks/Equipment Blanks Included in Lab Package?	X			
1) FB/EB result non-detect? If no, -sample result 3xFB/EB but 10xFB/EB, no qualification.		X		See nonconformance table below
ICP Interference Check Sample (ICS) included in Lab Package?			X	NA for a Limited review.
1) Analyzed at beginning of analytical run? If no, reject (R) data.			X	
2) %R criteria met? (80-120%) If no, %R>120%, no qualification if sample result non-detect; %R between 121-150%, J positive results, biased high; %R between 50-79%, J/UJ results, biased low; %R150%, reject (R) result			X	
3) Spot check accuracy of %Rs			X	
Matrix Spike/Matrix Spike Duplicate Data Included in Lab Package?	X			
1) MS/MSD %R (75-125%R) and RPD (+20%) criteria met? - %R>125% J positive results for affected analyte(s) for all samples in the same batch/SDG, accept NDs; -%R		X		See nonconformance table below
2) Was a sample spiked at the frequency of 1/batch or 20 samples?	X			
3) Was the MS performed on a site sample?	X			Soil: Performed on FS18-20.0-20.5 and batch QC. AQ: Batch QC only. Batch QC was not assessed.
4) Was the MS performed on a FB/EB or TB? If yes, J all sample data.		X		

ITEM	YES	NO	N/A	COMMENTS
Post Digestion Spike			X	NA for a Limited review.
1) %R criteria met? (75-125%R) - %R>125% J positive results for affected analyte(s) for all samples in the same batch/SDG, accept NDs.; - %R			X	
2) Was the spike performed on a FB/EB or TB? If yes, J all sample data.			X	
3) Was a sample spiked at the frequency of 1/batch or 20 samples?			X	
Laboratory Duplicate Data Included in Lab Package?		X		MS/MSD analyses were performed in lieu of laboratory duplicate analyses.
Aqueous - If RPD is >20% but 5x the QL, estimate (J) results >the QL. - If RPD is >100%, reject R results >= the QL.- If sample and/or duplicate is the QL, estimate (J) positive results 2x the QL, reject R non-detects and positive results			X	
Soil - If RPD is >35% but 5x the QL, estimate (J) results > the QL. - If RPD is >120%, reject results > the QL. - If sample and/or duplicate is 2x the QL, estimate (J) positive results 4x the QL, reject nondetects and positive results			X	
Was a Laboratory Control Sample (LCS) Included in Lab Package?	X			
1) LCS %R criteria met? (80-120%R). If no, J/UJ all affected analytes(s) for all samples in the same batch/SDG.	X			
2) Was an LCS analyzed at the frequency of 1/batch or 20 samples? If no, J/UJ affected analyte(s) for all samples in the same batch/SDG.	X			
Serial Dilution			X	NA for a Limited review.
1) %D(25xIDL (7000) or >10xIDL (6010) and %D >10% J positive results for affected analyte(s) for all samples in the same batch/SDG, accept NDs.			X	
2) Was the frequency 1/batch or 20 samples?			X	
3) Was a site sample used?			X	
4) Was a FB/EB or TB used? If yes, J all sample data.			X	
5) Spot check accuracy of %Ds.			X	

ITEM	YES	NO	N/A	COMMENTS
Field Duplicate Data included in Lab Package?	X			FS18-4.0-4.5 and FS18-4.0-4.5X
Aqueous - If RPD is >20% but 5x the QL, estimate (J) results > the QL. - If RPD is >100%, reject R results >= the QL. - If sample and/or duplicate is the QL, estimate (J) positive results 2x the QL, reject R non-detects and positive results			X	
Soil - If RPD is >35% but 5x the QL, estimate (J) results > the QL. - If RPD is >120%, reject results > the QL. - If sample and/or duplicate is 2x the QL, estimate (J) positive results 4x the QL, reject nondetects and positive results		X		
Percent Solids data included in Lab Package?	X			
1) %Solids criteria (Reg 2 criteria) met? (>=50%)	X			

Field Blanks

Blank ID	Analyte	Result	QL	Units	Associated Samples
FS-FB20140317	CHROMIUM	2.0	10	ug/l	All soil samples

Matrix Spikes

Sample ID	Analyte	Analysis Batch	MS % Recovery	MSD % Recovery	Lower Limit	Upper Limit
FS8-20.0-20.5	ANTIMONY	MP78386	61.5	57.9	75	125
FS8-20.0-20.5	CHROMIUM	MP78386	171.4	199.9	75	125

Data Validation Report

Project:	PPG Garfield Avenue Supplemental Remedial Investigation (GARIS) Forrest Street Groundwater and Soil	
Laboratory:	Accutest, Dayton, NJ	
Laboratory Job No.:	JB63992 and JB63992A	
Analysis/Method:	Hexavalent Chromium SW846 3060A/7196 Metals by ICP-AES/ SW846-6010	
Validation Level:	Full (Hexavalent chromium) Limited (Metals)	
Site Location/Address:	Forrest Street, Jersey City, NJ	
AECOM Project No:	60154801.6001A	
Prepared by:	Paula DiMattei /AECOM	Completed on: 05/16/2014
Reviewed by:	Lisa Krowitz /AECOM	File Name: JB63992_A_R_2014-05-16_DV Report-F

Introduction

The data were reviewed in accordance with the FSP-QAPP and the following NJDEP validation Standard Operating Procedures (SOP):

- NJDEP Office of Data Quality SOP 5.A.10, Rev 3 (September 2009), SOP for Analytical Data Validation of Hexavalent Chromium - for USEPA SW-846 Method 3060A, USEPA SW-846 Method 7196A and USEPA SW-846 Method 7199;
- NJDEP Office of Data Quality SOP 5.A.16, Rev 1 (May 2002), Quality Assurance Data Validation of Analytical Deliverables for Inorganics (based on USEPA SW-846 Methods)

The results of quality control data analyzed with site samples were used to assess the overall reliability of the data. The following qualifiers were used to identify data quality issues:

- U: Indicates the analyte was not detected in the sample above the sample reporting limit.
- J: Indicates the result was an estimated value; the associated numerical value was an approximate concentration of the analyte in the sample.
- UJ: Indicates the analyte was not detected above the reporting limit and the reporting limit was approximate.
- R: The sample result was rejected due to serious deficiencies; the presence or absence of the analyte could not be confirmed.
- RA: The sample result was rejected but is still considered usable.

Sample Information

The samples listed below were collected by AECOM on April 7, 2014 as part of the PPG Garfield Avenue Supplemental Remedial Investigation (GARIS) Forrest Street Groundwater and Soil sampling at the PPG Forrest Street, Jersey City, NJ. Only the samples and parameters listed below were validated.

Field ID	Laboratory ID	Matrix	Fraction
FS-FB20140407 (Equipment Blank)	JB63992-12	Aqueous	Hexavalent Chromium
FS-FB20140407 (Equipment Blank)	JB63992-12A	Aqueous	Metals
FSI9-0.4-0.9	JB63992-1	Soil	Hexavalent Chromium
FSI9-0.4-0.9	JB63992-1A	Soil	Metals
FSI9-1.5-2.0	JB63992-10	Soil	Hexavalent Chromium
FSI9-1.5-2.0	JB63992-10A	Soil	Metals
FSI9-10.0-10.5	JB63992-4	Soil	Hexavalent Chromium
FSI9-10.0-10.5	JB63992-4A	Soil	Metals
FSI9-12.0-12.5	JB63992-5	Soil	Hexavalent Chromium
FSI9-12.0-12.5	JB63992-5A	Soil	Metals
FSI9-14.0-14.5	JB63992-6	Soil	Hexavalent Chromium
FSI9-14.0-14.5	JB63992-6A	Soil	Metals
FSI9-14.0-14.5X (Field Duplicate of FSI9-14.0-14.5)	JB63992-7	Soil	Hexavalent Chromium
FSI9-14.0-14.5X (Field Duplicate of FSI9-14.0-14.5)	JB63992-7A	Soil	Metals
FSI9-16.0-16.5	JB63992-8	Soil	Hexavalent Chromium
FSI9-16.0-16.5	JB63992-8A	Soil	Metals
FSI9-16.5-17.0	JB63992-9	Soil	Hexavalent Chromium
FSI9-16.5-17.0	JB63992-9A	Soil	Metals
FSI9-5.0-5.5	JB63992-2	Soil	Hexavalent Chromium
FSI9-5.0-5.5	JB63992-2A	Soil	Metals
FSI9-7.0-7.5	JB63992-3	Soil	Hexavalent Chromium
FSI9-7.0-7.5	JB63992-3A	Soil	Metals
FSI9-8.0-8.5	JB63992-11	Soil	Hexavalent Chromium
FSI9-8.0-8.5	JB63992-11A	Soil	Metals

The samples were collected following the procedures detailed in the Remedial Investigation Work Plan - Soil for Non-Residential Chromate Chemical Production Waste Sites 114, 132, 133, 135, 137, 143, and 186, Jersey City, New Jersey, or applicable proposal or work plan, and the Field Sampling Plan/Quality Assurance Project Plan for Non-Residential and Residential Chromium Sites Hudson County, New Jersey (December 2011).

General Comments

The data package was complete. Quality control (QC) issues identified during validation are discussed below. Refer to the Target Analyte Summary Hit(s) in Attachment A for a listing of all detected results, qualified results, and associated qualifications, where applicable. The nonconformances for each section discussed below are presented in Attachment B.

Hexavalent Chromium

MS Results

Sample FSI9-16.0-16.5 (JB63992-8) was selected for the matrix spike (MS) analysis associated with the samples in this SDG and was used for supporting data quality recommendations. The soluble and insoluble MS recoveries were 82.1% and 92.9%, respectively; which met the quality control (QC) criteria of 75-125%. The post digestion spike (PDS) recovery was 98.7%, which met the PDS criteria of 85-115%. No data qualification was required on the basis of spike recoveries.

Sample Results

Reported results (flagged B by the laboratory) that were less than the reporting limit (RL), but greater than or equal to the method detection limit (MDL) are approximate values and have been qualified as estimated (J).

Metals

Laboratory Blanks/Equipment Blanks

Method Blank

Chromium was detected in the method blank (MP78830-MB1) associated with all of the soil samples in this SDG, at a concentration above the MDL, but below the RL. Since the results for chromium in the associated soil samples were greater than ten times the amount detected in the method blank, no qualifications were required.

MS Results

Sample FSI9-16.0-16.5 (JB63992-8A) was selected for MS analysis in association with the Method 6010 analysis in this SDG. The recoveries of antimony did not meet the QC criteria of 75-125%. The positive and nondetect results for antimony in the associated soil samples were qualified as estimated (J/UJ) with a potential low bias.

Sample Results

Reported results (flagged B by the laboratory) that were less than the RL, but greater than or equal to the MDL are approximate values that have been qualified as estimated (J).

Data Quality and Usability

In general, these data appear to be valid and may be used for decision-making purposes. No data were rejected. Qualified results, if applicable, are presented in Attachments A and B.

Sample results for antimony qualified due to low MS recoveries are usable as estimated values with the potential for low bias.

Sample results reported between the MDL and RL are usable as estimated values with an unknown directional bias.

ATTACHMENTS

Attachment A: Target Analyte Summary Hitlist(s)

Attachment B: Data Validation Report Form

Attachment A

Target Analyte Summary Hitlist(s)

Soil Target Analyte Summary Hit List (Hexavalent Chromium)

Site Name PPG Garfield Avenue Supplemental Remedial Investigation (GARIS) Forrest Street
Sampling Date April 7, 2014
Lab Name/ID Accutest, Dayton, NJ
SDG No JB63992
Sample Matrix Soil
Trip Blank ID NA
Field Blank ID FS-FB20140407

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
FSI9-0.4-0.9	JB63992-1	CHROMIUM (HEXAVALENT)	U	0.62	0.62	0.42		
FSI9-1.5-2.0	JB63992-10	CHROMIUM (HEXAVALENT)	U	4.7	4.7	0.44		
FSI9-10.0-10.5	JB63992-4	CHROMIUM (HEXAVALENT)	U	0.46B	0.46	0.51	Qualify	31
FSI9-12.0-12.5	JB63992-5	CHROMIUM (HEXAVALENT)	U	0.42B	0.42	0.47	Qualify	31
FSI9-14.0-14.5	JB63992-6	CHROMIUM (HEXAVALENT)	U	0.25B	0.25	0.44	Qualify	31
FSI9-14.0-14.5X	JB63992-7	CHROMIUM (HEXAVALENT)	U	0.15B	0.15	0.45	Qualify	31
FSI9-16.0-16.5	JB63992-8	CHROMIUM (HEXAVALENT)	U	0.21B	0.21	0.46	Qualify	31
FSI9-5.0-5.5	JB63992-2	CHROMIUM (HEXAVALENT)	U	1.4	1.4	0.47		
FSI9-7.0-7.5	JB63992-3	CHROMIUM (HEXAVALENT)	U	0.52	0.52	0.50		
FSI9-8.0-8.5	JB63992-11	CHROMIUM (HEXAVALENT)	U	0.65	0.65	0.52		

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

NJDEP Laboratory Footnote

1. The value reported is less than or equal to 3x the value in the preparation/reagent blank. It is the policy of NJDEP-DPFSR to negate the reported value due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.

2. The value reported is greater than three (3) times but less than ten (10) times the value in the preparation/reagent blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to the preparation/reagent blank contamination. The "B" qualifier alerts the end-user to the presence of this analyte in the preparation/reagent blank.
3. The value reported is less than or equal to three (3) times the value in the trip/field blank. It is the policy of NJDEP-DPF SR to negate the reported value as due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
4. The value reported is greater than three (3) times but less than ten (10) times the value in the trip/field blanks and is considered "real". However, the reported value must be quantitatively qualified "J" due to trip/field blank contamination.
5. The concentration reported by the laboratory is incorrectly calculated.
6. The laboratory failed to report the presence of the analyte in the sample.
7. The reported Hexavalent Chromium value was qualified because the Calibration Check Standard was not within the recovery range (90-110 percent).
8. In the Duplicate Sample Analysis, Hexavalent Chromium fell outside the control limits of ≤ 20 percent for sample results $> 4xRL$ or $+ RL$ for sample results $< 4xRL$. Therefore, the result was qualified.
9. This analyte was rejected because the laboratory performed the Duplicate Analysis on a field blank.
10. The reported value was qualified because the PVS recovery was greater than 115 percent.
11. The reported value was qualified because the PVS recovery was less than 85 percent.
12. The non-detected value was qualified (UJ) because the PVS recovery was less than 85 percent. The possibility of a false negative exists.
13. The reported analyte was qualified because the associated Calibration Blank result was greater than the MDL.
14. The laboratory made a transcription error. No hits were found in the raw data.
15. This analyte is qualified or rejected because the laboratory exceeded the holding time for digestion and/or analysis.

16. The laboratory subtracted the preparation/reagent blank from the sample result. The Reviewer's calculation puts the preparation/reagent blank back into the result.
17. The photocopy is unreadable. Therefore, the QA reviewer cannot read the laboratory's reported concentration result.
18. The reported value was qualified because the predigestion spike recovery was less than 75 %, but greater than 50%.
19. The reported value was qualified because the predigestion spike recovery was greater than 125 percent.
20. The non-detected value was qualified (UJ) because the redigestion spike recovery was less than 75 percent. The possibility of a false negative exists.
21. The reported result was qualified or rejected because the laboratory did not record the pH value(s) of the sample in a laboratory notebook.
22. The reported value was qualified (J/UJ) because the sample moisture content exceeded 50 percent.
23. The sample result was rejected because the soluble and insoluble matrix spike recoveries were less than 50%.
24. The detected sample result was qualified (J) because the incorrect spike concentration was used.
25. The reported sample results were rejected because the predigestion spike recovery was greater than 150 percent.
26. The reported sample results were rejected because the redigestion spike recovery was greater than 150 percent.
27. The reported value was qualified (J) because the redigestion spike recovery was less than 75 percent.
28. The reported value was qualified (J/UJ) because the sample digestion temperature was less than 90C.
29. In the Field Duplicate Sample Analysis, Hexavalent Chromium fell outside the control limits of $\leq 20\%$ for sample results $> 4xRL$ or $+ RL$ for sample results $< 4xRL$. Therefore, the result was qualified.
30. The reported value was qualified as estimated (J/UJ) but the bias is uncertain due to both high and low MS recoveries.
31. The reported result was greater than the MDL but less than the RL and qualified (J) as estimated by the laboratory.

32. The reported value was qualified because the sample replicate precision criterion of $\leq 20\%$ for method 7199 was exceeded.
33. The reported value was qualified (J/UJ) because the laboratory control sample (LCS) recovery was less than 80%.
34. The reported value was qualified (J) because the laboratory control sample (LCS) recovery was greater than 120%.
35. The reported result was qualified because the matrix spike analysis was not performed at the proper frequency.
36. The reported result was qualified because the laboratory duplicate analysis was not performed at the proper frequency.
37. The result was qualified because the cooler temperature upon sample receipt exceeded 6C.
38. The reported value was qualified because the redigestion spike recovery was greater than 125 percent.
39. The reported result was rejected because the laboratory failed to perform the reanalysis due to insufficient sample volume.
40. The reported results was qualified because the laboratory failed to analyze an ending CCB.
41. The reported result was qualified because the laboratory failed to make the proper method specific pH adjustment.
42. The reported result was rejected because the laboratory failed to reanalyze the MS and associated sample(s) due to failed MS recoveries.

Soil Target Analyte Summary Hit List (Metals)

Site Name PPG Garfield Avenue Supplemental Remedial Investigation (GARIS) Forrest Street
Sampling Date April 7, 2014
Lab Name/ID Accutest, Dayton, NJ
SDG No JB63992A
Sample Matrix Soil
Trip Blank ID NA
Field Blank ID FS-FB20140407

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
FSI9-0.4-0.9	JB63992-1A	ANTIMONY	U	U	U	2.2	Qualify	15
FSI9-0.4-0.9	JB63992-1A	CHROMIUM	0.089	10.4	10.4	1.1		
FSI9-0.4-0.9	JB63992-1A	NICKEL	U	4.7	4.7	4.4		
FSI9-0.4-0.9	JB63992-1A	VANADIUM	U	10.9	10.9	5.5		
FSI9-1.5-2.0	JB63992-10A	ANTIMONY	U	0.61B	0.61	2.2	Qualify	15,23
FSI9-1.5-2.0	JB63992-10A	CHROMIUM	U	136	136	1.1		
FSI9-1.5-2.0	JB63992-10A	NICKEL	U	18.2	18.2	4.3		
FSI9-1.5-2.0	JB63992-10A	VANADIUM	U	41.8	41.8	5.4		
FSI9-10.0-10.5	JB63992-4A	ANTIMONY	U	U	U	2.5	Qualify	15
FSI9-10.0-10.5	JB63992-4A	CHROMIUM	0.089	18.2	18.2	1.3		
FSI9-10.0-10.5	JB63992-4A	NICKEL	U	16.5	16.5	5.1		
FSI9-10.0-10.5	JB63992-4A	VANADIUM	U	21.6	21.6	6.3		
FSI9-12.0-12.5	JB63992-5A	ANTIMONY	U	U	U	2.3	Qualify	15
FSI9-12.0-12.5	JB63992-5A	CHROMIUM	0.089	17.1	17.1	1.1		
FSI9-12.0-12.5	JB63992-5A	NICKEL	U	13.2	13.2	4.6		
FSI9-12.0-12.5	JB63992-5A	VANADIUM	U	23.9	23.9	5.7		
FSI9-14.0-14.5	JB63992-6A	ANTIMONY	U	U	U	2.2	Qualify	15
FSI9-14.0-14.5	JB63992-6A	CHROMIUM	0.089	15.2	15.2	1.1		

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
FSI9-14.0-14.5	JB63992-6A	NICKEL	U	11.2	11.2	4.4		
FSI9-14.0-14.5	JB63992-6A	VANADIUM	U	25.8	25.8	5.5		
FSI9-14.0-14.5X	JB63992-7A	ANTIMONY	U	U	U	2.2	Qualify	15
FSI9-14.0-14.5X	JB63992-7A	CHROMIUM	0.089	13.4	13.4	1.1		
FSI9-14.0-14.5X	JB63992-7A	NICKEL	U	9.7	9.7	4.3		
FSI9-14.0-14.5X	JB63992-7A	VANADIUM	U	23.0	23.0	5.4		
FSI9-16.0-16.5	JB63992-8A	ANTIMONY	U	U	U	2.3	Qualify	15
FSI9-16.0-16.5	JB63992-8A	CHROMIUM	0.089	8.8	8.8	1.1		
FSI9-16.0-16.5	JB63992-8A	NICKEL	U	30.0	30.0	4.6		
FSI9-16.0-16.5	JB63992-8A	VANADIUM	U	15.4	15.4	5.7		
FSI9-16.5-17.0	JB63992-9A	ANTIMONY	U	U	U	2.4	Qualify	15
FSI9-16.5-17.0	JB63992-9A	CHROMIUM	0.089	5.7	5.7	1.2		
FSI9-16.5-17.0	JB63992-9A	NICKEL	U	10.5	10.5	4.8		
FSI9-16.5-17.0	JB63992-9A	VANADIUM	U	10.1	10.1	6.0		
FSI9-5.0-5.5	JB63992-2A	ANTIMONY	U	U	U	2.4	Qualify	15
FSI9-5.0-5.5	JB63992-2A	CHROMIUM	0.089	28.8	28.8	1.2		
FSI9-5.0-5.5	JB63992-2A	NICKEL	U	14.7	14.7	4.7		
FSI9-5.0-5.5	JB63992-2A	VANADIUM	U	19.3	19.3	5.9		
FSI9-7.0-7.5	JB63992-3A	ANTIMONY	U	U	U	2.5	Qualify	15
FSI9-7.0-7.5	JB63992-3A	CHROMIUM	0.089	18.0	18.0	1.3		
FSI9-7.0-7.5	JB63992-3A	NICKEL	U	15.5	15.5	5.0		
FSI9-7.0-7.5	JB63992-3A	VANADIUM	U	25.5	25.5	6.3		
FSI9-8.0-8.5	JB63992-11A	ANTIMONY	U	U	U	2.5	Qualify	15
FSI9-8.0-8.5	JB63992-11A	CHROMIUM	0.089	16.8	16.8	1.2		
FSI9-8.0-8.5	JB63992-11A	NICKEL	U	14.4	14.4	5.0		

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
FSI9-8.0-8.5	JB63992-11A	VANADIUM	U	21.6	21.6	6.2		

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

NJDEP Laboratory Footnote

1. The value reported is less than or equal to 3x the value in the method blank. It is the policy of NJDEP-DPFSR to negate the reported value due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
2. The value reported is greater than three (3) but less than ten (10) times the value in the method blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to the method blank contamination. The "B" qualifier alerts the end-user to the presence of this analyte in the method blank.
3. The value reported is less than or equal to 3x the value in the trip/field blank. It is the policy of NJDEP-DPFSR to negate the reported value as due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
4. The value reported is greater than 3x but less than ten (10) the value in the trip/field blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to trip/field blank contamination.
5. The concentration reported by the laboratory is incorrectly calculated.
6. The laboratory failed to report the presence of the analyte in the sample.
7. The reported metal value was qualified because the Calibration Verification Standard was not within the recovery range (90-110 percent).
8. In the MS/MSD Sample Analysis, this analyte fell outside the control limits of 20% RPD. Therefore, the result was qualified.
9. This analyte was qualified because the laboratory performed the MS/MSD Analysis on a field blank.
10. The reported analyte was qualified because the associated Calibration Blank result was greater than the MDL.

11. The reported value was qualified because serial dilution analysis was not within QC limit of 10% D.
12. This analyte is rejected because the laboratory exceeded the holding time for digestion and analysis.
13. The laboratory subtracted the method blank from the sample result. The reviewer's calculation has added the method blank result to the reported concentration.
14. The photocopy submitted is illegible. Therefore, the QA reviewer cannot read the laboratory's reported concentration result.
15. The reported or nondetected value was qualified because the MS/MSD spike recovery was less than 75 percent.
16. The reported value was qualified because the MS/MSD spike recovery was greater than 125 percent.
17. The reported value was qualified as estimated (J/UJ) but the bias is uncertain due to both high and low MS recoveries.
18. The reported values were qualified because the laboratory duplicate exceeded 35 percent RPD for results greater than 5X the reporting limit or the absolute difference exceeded two times the reporting limit for sample result less than 5 times the reporting limit.
19. The reported value was qualified because the field duplicate exceeded 35 percent RPD for results greater than 5X the reporting limit or the absolute difference exceeded two times the reporting limit for sample result less than 5 times the reporting limit.
20. The reported value was qualified because the LCS recovery was less than 80 percent.
21. The reported value was qualified because the sample moisture content was greater than 50 percent.
22. The reported value was rejected because the field duplicate absolute difference was greater than 4 times the RL or the RPD was greater than 120%.
23. The reported result was greater than the MDL but less than the RL and qualified (J) as estimated by the laboratory.
24. The field duplicate absolute difference exceeded two times the reporting limit for sample result less than 5 times the reporting limit.
25. The reported value was qualified because the LCS recovery was greater than 120 percent.

Attachment B

Data Validation Report Form

Client Name: PPG Industries	Project Number: 60154801.6001A
Site Location: PPG Garfield Avenue Supplemental Remedial Investigation (GARIS) Forrest Street Groundwater and Soil, Jersey City, NJ	Project Manager: William Spronz
Laboratory: Accutest, Dayton, NJ	Type of Validation: Full
Laboratory Job No: JB63992	Date Checked: 5/16/14
Validator: Paula DiMattei	Peer: Lisa Krowitz

ITEM	YES	NO	N/A	COMMENTS
Sample results included?	X			
Reporting Limits met project requirements?	X			
Field I.D. included?	X			
Laboratory I.D. included?	X			
Sample matrix included?	X			
Sample receipt temperature 2-6C?	X			
Signed COCs included?	X			
Date of sample collection included?	X			
Date of sample digestion included?	X			
Holding time to digestion met criteria? (Soils -30 days from collection to digestion.)	X			
Date of analysis included?	X			
Holding time to analysis met criteria? (Soils -168 hours from digestion to analysis; Aqueous - 24 hours from collection to analysis.)	X			
Method reference included?	X			
Laboratory Case Narrative included?	X			

Definitions: MDL Method Detection Limit; %R Percent Recovery; RL Reporting Limit; RPD Relative Percent Difference; RSD Relative Standard Deviation :Corr Correlation Coefficient.

ITEM	YES	NO	N/A	COMMENTS
Initial calibration documentation included in lab package?	X			
1) Blank plus 4 standards (7196A) or blank plus 3 standards (7199)	X			
2) Correlation coefficient of =0.995 (7196A) or =0.999 (7199)	X			
3) Calibrate daily or each time instrument is set up.	X			
Calibration Check Standard (CCS) for 7196A and Quality Control Sample (QCS) for 7199 Included in Lab Package?	X			
1) %R criteria met? (90 - 110%)	X			
2) Correct frequency of one per every 10 samples	X			
3) CCS and QCS from independent source and at mid-level of calibration curve	X			
Calibration Blanks	X			
1) Analyzed prior to initial calibration standards and after each CCS/QCS?	X			
2) Absolute value should not exceed MDL.	X			
Method Blank, Field Blanks and/or Equipment Blanks Included in Lab Package?	X			FS-FB20140407
1) Method blank analyzed with each preparation batch?	X			
2) Absolute value should not exceed MDL.	X			
Eh and pH Data	X			
1) Eh and pH data was included and plotted for all samples?	X			
Soluble Matrix Spike Data Included in Lab Package?	X			FSI9-16.0-16.5
1) Soluble Matrix %R criteria met? (75-125%R).	X			
2) Was the spike concentration 40 mg/Kg or twice the sample concentration?	X			
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	X			
Insoluble Matrix Spike Data Included in Lab Package?	X			
1) Insoluble Matrix %R criteria met? (75-125%R).	X			
2) Was the spike concentration around 400 to 800 mg/Kg?	X			
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	X			

ITEM	YES	NO	N/A	COMMENTS
Post Digestion Spike	X			
1) Post Digestion Spike %R criteria met? (85-115%R).	X			
2) Was the spike concentration 40 mg/Kg or twice the sample concentration?	X			
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	X			
Sample Duplicate Data Included in Lab Package?	X			FSI9-16.0-16.5
1) RPD criteria met? (RPD ≤20%) if both results are ≤4x RL or absolute difference ≤RL if either or both results are <4xRL.	X			
2) Was a sample duplicate analyzed at the frequency of 1 per batch or 20 samples?	X			
Was a Laboratory Control Sample (LCS) Included in Lab Package?	X			
1) %R criteria met? (80-120%R).	X			
2) Was an LCS analyzed at the frequency of 1/batch or 20 samples?	X			
Were any Field Duplicate samples submitted with this SDG?	X			FSI9-14.0-14.5 and FSI9-14.0-14.5X
1) Were Field duplicate RPD criteria met? (RPD≤20% for both sample results >4xRL or absolute difference ≤ RL if either or both results are <4xRL.	X			
Were all sample quantitation and reporting requirements met?	X			
1) Were all solid samples reported with percent solids > 50% ?	X			
2) Were any samples analyzed or reported with dilutions?		X		
Miscellaneous Items	X			
1) For soils by 7196A, was the pH within a range of 7.0-8.0?	X			
2) For soils by 7199, was the pH within a range of 9.0-9.5?			X	
3) For aqueous by 7196A, was the pH with a range of 1.5-2.5?	X			
4) For soils (3060A), was the digestion temperature 90-95C for at least 60 minutes?	X			
5) For 7199, was each sample injected twice and was the RPD =20?			X	

SDG#: JB63992
Batch: GN2894
 Cr+6 ICAL 04/11/14
 Soil
 (p. 53 of data pkg)

x - concentration	y - response
0	0
0.01	0.009
0.05	0.044
0.1	0.09
0.3	0.267
0.5	0.443
0.8	0.688
1	0.896

(p. 53 of data pkg)

AECOM Calculated Intercept	0.00004	OK	Reported intercept	0.00004
AECOM Slope	0.8829	OK	Reported Slope	0.8829
AECOM Calculated r	0.99968	OK	Reported r	0.99968

GP79237-B1
p.53

LCS calculation

Background Absorbance	0
Total absorbance	0.846
Total absorbance - background	0.846
Instrument Concentration	0.958
Sample weight (mg/kg)	0.0025
Final Volume (L)	0.1
Dilution Factor	1

AECOM Calculated LCS Result (mg/Kg)	38.3	OK	Reported Result (mg/Kg)	38.3
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%R = Found/True*100

p. 34

True Value (mg/kg)	40
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AECOM Calculated %R	95.8	OK	Reported %R	95.8
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MS calculation

JB63992-8 [FSI9-16.0-16.5]p.53

Background reading	0
Total absorbance	0.322
Total absorbance - background	0.322
Instrument Concentration	0.3647
Sample weight (mg/kg)	0.00249
Final Volume (L)	0.1
Percent solids	0.863
Dilution Factor	50

AECOM Calculated MS Result (mg/Kg)	849	OK	Reported Result (mg/Kg)	849
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%R = Found/True*100

JB63992-8 [FSI9-16.0-16.5]p.36

True Value (mg/kg)	913
Native concentration (mg/Kg)	0.21

AECOM%R	92.9	OK	Reported %R	92.9
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Percent Solids

JB63992-8 [FSI9-16.0-16.5]p.38

Empty dish weight=	25.77
Wet weight=	32.20
Dry weight=	31.32

AECOM%solids =	86.3	OK	reported %solids=	86.3
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Reporting Limit**JB63992-8 [FSI9-16.0-16.5]p.17**

Low Standard	0.01		
Initial weight (mg/kg)	0.00246		
Final volume (L)	0.1		
Percent solids	0.863		
Dilution Factor	1		
Reporting Limit	0.47	OK rounding	Reported RL (mg/Kg)= 0.46

Sample Calculations**JB63992-8 [FSI9-16.0-16.5]p.17,
53**

Background reading	0		
Total absorbance	0.004		
Total absorbance - background	0.004		
Instrument Response	0.004		
Sample weight (mg/kg)	0.00246		
Final Volume (L)	0.1		
Percent solids	0.863		
Dilution Factor	1		
AECOM Calculated Result (mg/Kg)	0.21	OK	Reported Result (mg/Kg) 0.21

Client Name: PPG Industries	Project Number: 60154801.6001A
Site Location: PPG Garfield Avenue Supplemental Remedial Investigation (GARIS) Forrest Street Groundwater and Soil, Jersey City, NJ	Project Manager: William Spronz
Laboratory: Accutest, Dayton, NJ	Type of Validation: Limited
Laboratory Job No: JB63992A	Date Checked: 5/16/14
Validator: Paula DiMattei	Peer: Lisa Krowitz

ITEM	YES	NO	N/A	COMMENTS
Sample results included?	X			
Reporting Limits met project requirements?	X			
Field I.D. included?	X			
Laboratory I.D. included?	X			
Sample matrix included?	X			
Sample receipt temperature 2-6C?	X			
Signed COCs included?	X			
Date of sample collection included?	X			
Date of sample digestion included?	X			
Date of analysis included?	X			
Holding time met QC criteria? (Metals -180 days from sample collection; Mercury - 28 days from sample collection. If HT exceeded by 10 days R all results.	X			
Method reference included?	X			
Laboratory Case Narrative included?	X			

Definitions: MDL Method Detection Limit; %R Percent Recovery; RL Reporting Limit; RPD Relative Percent Difference; RSD Relative Standard Deviation ;Corr Correlation Coefficient.

ITEM	YES	NO	N/A	COMMENTS
Sample dilutions?		X		
Initial calibration documentation included in lab package?			X	NA for a Limited review
1) Calibrate daily or each time instrument is set up.			X	
2) ICP (6010) -Blank plus 1 standard? If no, reject (R) data.			X	
3) Hg (7470/7471) -Blank plus 5 standards? If no, reject (R) data.			X	
Initial Calibration Verification Standard (ICV) for ICP (6010) and Initial Calibration Check Standard (ICCS) for Hg (7470/7471) included in lab package?			X	
1) Analyzed immediately after initial calibration? If no, reject (R) data.			X	
2) %R criteria met? (90-110%). If no, J positive results for affected analyte(s) if %R between 80-89% and 111-120% and indicate bias; UJ non-detect results for affected analyte(s) if %R between 80-89% , and R all data for affected analyte(s) if %R 120%.			X	
3) Spot check ICV/ICCS results for several analytes.			X	
Continuing Calibration Verification Standard (CCV) for ICP (6010) and Calibration Check Standard (CCS) for Hg (7470/7471) included in Lab Package?			X	
1) Analyzed immediately after each ICV/ICC/CB and after every 10 samples? If no, reject (R) data.			X	
2) CCS and CCV from independent source and at mid-level of calibration curve. If no, reject (R) data.			X	
3) %R criteria met? (90-110%R). If no, J positive results for affected analyte(s) if %R between 80-89% and 111-120% and indicate bias; UJ non-detect results for affected analyte(s) if %R between 80-89% and R all data for affected analyte(s) if %R 120%.			X	
4) Spot check CCV/CCS results for several analytes.			X	
Low Calibration Standard (CRI) included in Lab Package?			X	
1) %R criteria met? - 50-150% for Co, Mn, Zn, by ICP-MS; Pb, Tl by 6010; 70-130% all others. If no, refer to ILM05.4 NJ SOP 5.A.2 for actions.			X	

ITEM	YES	NO	N/A	COMMENTS
Calibration Blanks			X	
1) Analyzed after daily calibration and after each ICV/ICC/CCV/CCS and after every 10 samples? If no, reject (R) data.			X	
2) Absolute value 10xCB result, no qualification.			X	
Method Blank Included in Lab Package?	X			
1) Method blank analyzed with each preparation batch or every SDG, or 1/20 samples? If no, reject (R) data, except no aqueous MB required for FB/EB if only soil samples were analyzed.	X			
2) Method blank analyzed 1/20 samples? If - MB 1/25, J sample results from 21-25; -MB >1/25, R sample results after 25th sample.	X			
3) MB results nondetect? If no, -sample result 3xMB but 10xMB, no qualification.		X		see nonconformance table below
4) Negative MB result reported? If yes, -Positive sample result		X		
Field Blanks/Equipment Blanks Included in Lab Package?	X			FS-FB20140407
1) FB/EB result non-detect? If no, -sample result 3xFB/EB but 10xFB/EB, no qualification.	X			
ICP Interference Check Sample (ICS) included in Lab Package?			X	NA for a Limited review
1) Analyzed at beginning of analytical run? If no, reject (R) data.			X	
2) %R criteria met? (80-120%) If no, %R>120%, no qualification if sample result non-detect; %R between 121-150%, J positive results, biased high; %R between 50-79%, J/UJ results, biased low; %R150%, reject (R) result			X	
3) Spot check accuracy of %Rs			X	
Matrix Spike/Matrix Spike Duplicate Data Included in Lab Package?	X			
1) MS/MSD %R (75-125%R) and RPD (+20%) criteria met? - %R>125% J positive results for affected analyte(s) for all samples in the same batch/SDG, accept NDs; -%R		X		See nonconformance table below.
2) Was a sample spiked at the frequency of 1/batch or 20 samples?	X			
3) Was the MS performed on a site sample?	X			
4) Was the MS performed on a FB/EB or TB? If yes, J all sample data.		X		

ITEM	YES	NO	N/A	COMMENTS
Post Digestion Spike			X	NA for a Limited review
1) %R criteria met? (75-125%R) - %R>125% J positive results for affected analyte(s) for all samples in the same batch/SDG, accept NDs.; - %R			X	
2) Was the spike performed on a FB/EB or TB? If yes, J all sample data.			X	
3) Was a sample spiked at the frequency of 1/batch or 20 samples?			X	
Laboratory Duplicate Data Included in Lab Package?		X		MS/MSD analyses were performed in lieu of a laboratory duplicate analysis.
Aqueous - If RPD is >20% but 5x the QL, estimate (J) results >the QL. - If RPD is >100%, reject R results >= the QL.- If sample and/or duplicate is the QL, estimate (J) positive results 2x the QL, reject R non-detects and positive results			X	
Soil - If RPD is >35% but 5x the QL, estimate (J) results > the QL. - If RPD is >120%, reject results > the QL. - If sample and/or duplicate is 2x the QL, estimate (J) positive results 4x the QL, reject nondetects and positive results			X	
Was a Laboratory Control Sample (LCS) Included in Lab Package?	X			
1) LCS %R criteria met? (80-120%R). If no, J/UJ all affected analytes(s) for all samples in the same batch/SDG.	X			
2) Was an LCS analyzed at the frequency of 1/batch or 20 samples? If no, J/UJ affected analyte(s) for all samples in the same batch/SDG.	X			
Serial Dilution			X	NA for a Limited review
1) %D(25xIDL (7000) or >10xIDL (6010) and %D >10% J positive results for affected analyte(s) for all samples in the same batch/SDG, accept NDs.			X	
2) Was the frequency 1/batch or 20 samples?			X	
3) Was a site sample used?			X	
4) Was a FB/EB or TB used? If yes, J all sample data.			X	
5) Spot check accuracy of %Ds.			X	

ITEM	YES	NO	N/A	COMMENTS
Field Duplicate Data included in Lab Package?	X			FSI9-14.0-14.5 and FSI9-14.0-14.5X
Aqueous - If RPD is >20% but 5x the QL, estimate (J) results > the QL. - If RPD is >100%, reject R results >= the QL. - If sample and/or duplicate is the QL, estimate (J) positive results 2x the QL, reject R non-detects and positive results				
Soil - If RPD is >35% but 5x the QL, estimate (J) results > the QL. - If RPD is >120%, reject results > the QL. - If sample and/or duplicate is 2x the QL, estimate (J) positive results 4x the QL, reject nondetects and positive results	X			
Percent Solids data included in Lab Package?	X			
1) %Solids criteria (Reg 2 criteria) met? (>=50%)	X			

Laboratory Blanks

Blank ID	Analyte	Result	QL	Units	Associated Samples
MP78830-MB1	CHROMIUM	0.089	0.99	mg/kg	All soil samples

Matrix Spikes

Sample ID	Analyte	MS% Recovery	MSD % Recovery	Lower Limit	Upper Limit	RPD	RPD Limit
FSI9-16.0-16.5	ANTIMONY	65	58.7	75	125	ok	20

Data Validation Report

Project:	PPG Garfield Avenue Supplemental Remedial Investigation (GARIS) Forrest Street Groundwater and Soil	
Laboratory:	Accutest, Dayton, NJ	
Laboratory Job No.:	JB64098, JB64098A and JB64098R	
Analysis/Method:	Hexavalent Chromium SW846 3060A/7196 and Metals by ICP-AES/ SW846-6010	
Validation Level:	Full (Hexavalent chromium) Limited (Metals)	
Site Location/Address:	Forrest Street, Jersey City, NJ	
AECOM Project No:	60154801.6001A	
Prepared by:	Paula DiMattei /AECOM	Completed on: 05/17/2014
Reviewed by:	Lisa Krowitz /AECOM	File Name: JB64098_A_R_2014-05-17_DV Report-F

Introduction

The data were reviewed in accordance with the FSP-QAPP and the following NJDEP validation Standard Operating Procedures (SOP):

- NJDEP Office of Data Quality SOP 5.A.10, Rev 3 (September 2009), SOP for Analytical Data Validation of Hexavalent Chromium - for USEPA SW-846 Method 3060A, USEPA SW-846 Method 7196A and USEPA SW-846 Method 7199;
- NJDEP Office of Data Quality SOP 5.A.16, Rev 1 (May 2002), Quality Assurance Data Validation of Analytical Deliverables for Inorganics (based on USEPA SW-846 Methods)

The results of quality control data analyzed with site samples were used to assess the overall reliability of the data. The following qualifiers were used to identify data quality issues:

- U: Indicates the analyte was not detected in the sample above the sample reporting limit.
- J: Indicates the result was an estimated value; the associated numerical value was an approximate concentration of the analyte in the sample.
- UJ: Indicates the analyte was not detected above the reporting limit and the reporting limit was approximate.
- R: The sample result was rejected due to serious deficiencies; the presence or absence of the analyte could not be confirmed.
- RA: The sample result was rejected but is still considered usable.

Sample Information

The samples listed below were collected by AECOM on April 8, 2014 as part of the PPG Garfield Avenue Supplemental Remedial Investigation (GARIS) Forrest Street Groundwater and Soil sampling at the PPG Forrest Street, Jersey City, NJ. Only the samples and parameters listed below were validated.

Field ID	Laboratory ID	Matrix	Fraction
FS-FB20140408 (Equipment Blank)	JB64098-2	Aqueous	Hexavalent Chromium
FS-FB20140408 (Equipment Blank)	JB64098-2A	Aqueous	Metals
FSI1-1.0-1.5	JB64098-1	Soil	Hexavalent Chromium
FSI1-1.0-1.5	JB64098-1A	Soil	Metals
FSI1-1.0-1.5	JB64098-1R	Soil	Hexavalent Chromium

The samples were collected following the procedures detailed in the Remedial Investigation Work Plan - Soil for Non-Residential Chromate Chemical Production Waste Sites 114, 132, 133, 135, 137, 143, and 186, Jersey City, New Jersey, or applicable proposal or work plan, and the Field Sampling Plan/Quality Assurance Project Plan for Non-Residential and Residential Chromium Sites Hudson County, New Jersey (December 2011).

General Comments

The data package was complete. Quality control (QC) issues identified during validation are discussed below. Refer to the Target Analyte Summary Hit(s) in Attachment A for a listing of all detected results, qualified results, and associated qualifications, where applicable. The nonconformances for each section discussed below are presented in Attachment B.

Hexavalent Chromium

Laboratory Blanks/Equipment Blanks

Method Blank

Negative drift for hexavalent chromium was detected in the continuing calibration blanks (CCBs) and the method blank, at comparable amounts, impacting the equipment blank in this SDG. The nondetect hexavalent chromium result for the equipment blank was qualified as estimated (UJ).

MS Results

Sample FSI1-1.0-1.5 [JB64098-1] was selected for the soil matrix spike analysis and used for supporting data quality recommendations. The soluble and insoluble matrix spike (MS) recoveries from the initial batch were 2.9% and 73.2%, respectively. The soluble and insoluble MS recoveries did not meet quality control (QC) criteria of 75-125%R. The post digestion spike (PDS) recovery was 95.2%, which met the PDS criteria of 85-115%.

Based on poor MS recoveries, less than 75%R, the MS and associated samples were reanalyzed using Method 7196. The soluble and insoluble matrix spike recoveries from the re-analysis were 14% and 74.2%, respectively. The soluble and insoluble MS recoveries did not meet the QC criteria of 75-125%R. The post spike result for the re-analysis batch was recovered at 77.3% and the pH-adjusted PDS was 86%. The PDS did not meet the PDS criteria of 85-115%; however, the pH-adjusted PDS was within criteria.

Since the soluble and insoluble MS recoveries were outside the acceptable QC limit of 75-125%, additional parameters were analyzed to determine if possible matrix interferences could be the cause for the poor matrix spike recoveries. All the soil samples were tested for pH and oxidation reduction potential (ORP) and plotted on an Eh/pH phase diagram chart. From this chart, the source sample for the matrix spike analysis was plotted above the phase change line, indicating oxidizing potential with the sample matrix capable of supporting hexavalent chromium. Analyses for ferrous iron, sulfide screen, and total organic carbon (TOC) were performed on the MS source sample to confirm the oxidizing/reducing potential within the sample matrix. The sulfide screen was reported as nondetect, indicating no reducing agents within the sample matrix; however, the ferrous iron (0.14%) and the TOC results (37900 mg/kg) were positive, indicating potential reducing agents within the sample matrix.

Since the MS recoveries from both the initial and reanalysis did not meet the MS QC requirements, but at least one MS recovery was greater than 50%, the highest detected hexavalent chromium result was reported for the soil sample. The reported hexavalent chromium result in the soil sample in this SDG was qualified as estimated (J) due to the poor MS recoveries.

No further qualification was taken based on the low reanalysis PDS recovery since the initial PDS %R was acceptable.

Sample Results

Reported results (flagged B by the laboratory) that were less than the reporting limit (RL), but greater than or equal to the method detection limit (MDL) are approximate values and have been qualified as estimated (J).

Metals

Laboratory Blanks/Equipment Blanks

Method Blank

Chromium and nickel were detected in the method blank (MP78836-MB1) associated with some of the soil samples in this SDG, at concentrations above the MDLs, but below the RLs. Since the results for chromium and nickel in the associated soil sample were greater than ten times the amount detected in the method blank, no qualifications were required.

Sample Results

Reported results (flagged B by the laboratory) that were less than the RL, but greater than or equal to the MDL, are approximate values that have been qualified as estimated (J).

Data Quality and Usability

In general, these data appear to be valid and may be used for decision-making purposes. No data were rejected. Qualified results, if applicable, are presented in Attachments A and B.

The hexavalent chromium soil result for the soil sample in this SDG is usable as estimated values with the potential for low bias due to low soluble MS, and since the MS sample matrix appears to be reducing based on the Eh-pH plot and the presence of TOC and ferrous iron. The highest detected result was reported for the sample.

The hexavalent chromium result in the equipment blank FS-FB20140408 is usable as an estimated value with a potential low bias due to negative instrument drift.

Sample results reported between the MDL and RL are usable as estimated values with an unknown directional bias.

ATTACHMENTS

Attachment A: Target Analyte Summary Hitlist(s)

Attachment B: Data Validation Report Form

Attachment A

Target Analyte Summary Hitlist(s)

Soil Target Analyte Summary Hit List (Hexavalent Chromium)

Site Name PPG Garfield Avenue Supplemental Remedial Investigation (GARIS) Forrest Street
Sampling Date April 8, 2014
Lab Name/ID Accutest, Dayton, NJ
SDG No JB64098 and JB64098R
Sample Matrix Soil
Trip Blank ID NA
Field Blank ID FS-FB20140408

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
FSI1-1.0-1.5	JB64098-1R	CHROMIUM (HEXAVALENT)	U	1.4	1.4	0.69	Qualify	18

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

NJDEP Laboratory Footnote

- The value reported is less than or equal to 3x the value in the preparation/reagent blank. It is the policy of NJDEP-DPFSR to negate the reported value due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
- The value reported is greater than three (3) times but less than ten (10) times the value in the preparation/reagent blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to the preparation/reagent blank contamination. The "B" qualifier alerts the end-user to the presence of this analyte in the preparation/reagent blank.
- The value reported is less than or equal to three (3) times the value in the trip/field blank. It is the policy of NJDEP-DPFSR to negate the reported value as due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
- The value reported is greater than three (3) times but less than ten (10) times the value in the trip/field blanks and is considered "real". However, the reported value must be quantitatively qualified "J" due to trip/field blank contamination.
- The concentration reported by the laboratory is incorrectly calculated.

6. The laboratory failed to report the presence of the analyte in the sample.
7. The reported Hexavalent Chromium value was qualified because the Calibration Check Standard was not within the recovery range (90-110 percent).
8. In the Duplicate Sample Analysis, Hexavalent Chromium fell outside the control limits of ≤ 20 percent for sample results $> 4xRL$ or $+ RL$ for sample results $< 4xRL$. Therefore, the result was qualified.
9. This analyte was rejected because the laboratory performed the Duplicate Analysis on a field blank.
10. The reported value was qualified because the PVS recovery was greater than 115 percent.
11. The reported value was qualified because the PVS recovery was less than 85 percent.
12. The non-detected value was qualified (UJ) because the PVS recovery was less than 85 percent. The possibility of a false negative exists.
13. The reported analyte was qualified because the associated Calibration Blank result was greater than the MDL.
14. The laboratory made a transcription error. No hits were found in the raw data.
15. This analyte is qualified or rejected because the laboratory exceeded the holding time for digestion and/or analysis.
16. The laboratory subtracted the preparation/reagent blank from the sample result. The Reviewer's calculation puts the preparation/reagent blank back into the result.
17. The photocopy is unreadable. Therefore, the QA reviewer cannot read the laboratory's reported concentration result.
18. The reported value was qualified because the predigestion spike recovery was less than 75 %, but greater than 50%.
19. The reported value was qualified because the predigestion spike recovery was greater than 125 percent.
20. The non-detected value was qualified (UJ) because the redigestion spike recovery was less than 75 percent. The possibility of a false negative exists.
21. The reported result was qualified or rejected because the laboratory did not record the pH value(s) of the sample in a laboratory notebook.

22. The reported value was qualified (J/UJ) because the sample moisture content exceeded 50 percent.
23. The sample result was rejected because the soluble and insoluble matrix spike recoveries were less than 50%.
24. The detected sample result was qualified (J) because the incorrect spike concentration was used.
25. The reported sample results were rejected because the predigestion spike recovery was greater than 150 percent.
26. The reported sample results were rejected because the redigestion spike recovery was greater than 150 percent.
27. The reported value was qualified (J) because the redigestion spike recovery was less than 75 percent.
28. The reported value was qualified (J/UJ) because the sample digestion temperature was less than 90C.
29. In the Field Duplicate Sample Analysis, Hexavalent Chromium fell outside the control limits of $\leq 20\%$ for sample results $> 4xRL$ or $+ RL$ for sample results $< 4xRL$. Therefore, the result was qualified.
30. The reported value was qualified as estimated (J/UJ) but the bias is uncertain due to both high and low MS recoveries.
31. The reported result was greater than the MDL but less than the RL and qualified (J) as estimated by the laboratory.
32. The reported value was qualified because the sample replicate precision criterion of $\leq 20\%$ for method 7199 was exceeded.
33. The reported value was qualified (J/UJ) because the laboratory control sample (LCS) recovery was less than 80%.
34. The reported value was qualified (J) because the laboratory control sample (LCS) recovery was greater than 120%.
35. The reported result was qualified because the matrix spike analysis was not performed at the proper frequency.
36. The reported result was qualified because the laboratory duplicate analysis was not performed at the proper frequency.
37. The result was qualified because the cooler temperature upon sample receipt exceeded 6C.
38. The reported value was qualified because the redigestion spike recovery was greater than 125 percent.

39. The reported result was rejected because the laboratory failed to perform the reanalysis due to insufficient sample volume.
40. The reported results was qualified because the laboratory failed to analyze an ending CCB.
41. The reported result was qualified because the laboratory failed to make the proper method specific pH adjustment.
42. The reported result was rejected because the laboratory failed to reanalyze the MS and associated sample(s) due to failed MS recoveries.
43. The result was qualified due to negative instrument drift.

Aqueous Target Analyte Summary Hit List (Hexavalent Chromium)

Site Name PPG Garfield Avenue Supplemental Remedial Investigation (GARIS) Forrest Street
Sampling Date April 8, 2014
Lab Name/ID Accutest, Dayton, NJ
SDG No JB64098
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID NA

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/L)	Laboratory Sample Result (mg/L)	Validation Sample Result (mg/L)	RL (mg/L)	Quality Assurance Decision	NJDEP Validation Footnote
FS-FB20140408	JB64098-2	CHROMIUM (HEXAVALENT)	-0.017	U		0.020	Qualify	43

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

NJDEP Laboratory Footnote

- The value reported is less than or equal to 3x the value in the preparation/reagent blank. It is the policy of NJDEP-DPFSR to negate the reported value due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
- The value reported is greater than three (3) times but less than ten (10) times the value in the preparation/reagent blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to the preparation/reagent blank contamination. The "B" qualifier alerts the end-user to the presence of this analyte in the preparation/reagent blank.
- The value reported is less than or equal to three (3) times the value in the trip/field blank. It is the policy of NJDEP-DPFSR to negate the reported value as due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
- The value reported is greater than three (3) times but less than ten (10) times the value in the trip/field blanks and is considered "real". However, the reported value must be quantitatively qualified "J" due to trip/field blank contamination.
- The concentration reported by the laboratory is incorrectly calculated.

6. The laboratory failed to report the presence of the analyte in the sample.
7. The reported Hexavalent Chromium value was qualified because the Calibration Check Standard was not within the recovery range (90-110 percent).
8. In the Duplicate Sample Analysis, Hexavalent Chromium fell outside the control limits of ≤ 20 percent for sample results $> 4xRL$ or $+ RL$ for sample results $< 4xRL$. Therefore, the result was qualified.
9. This analyte was rejected because the laboratory performed the Duplicate Analysis on a field blank.
10. The reported value was qualified because the PVS recovery was greater than 115 percent.
11. The reported value was qualified because the PVS recovery was less than 85 percent.
12. The non-detected value was qualified (UJ) because the PVS recovery was less than 85 percent. The possibility of a false negative exists.
13. The reported analyte was qualified because the associated Calibration Blank result was greater than the MDL.
14. The laboratory made a transcription error. No hits were found in the raw data.
15. This analyte is qualified or rejected because the laboratory exceeded the holding time for digestion and/or analysis.
16. The laboratory subtracted the preparation/reagent blank from the sample result. The Reviewer's calculation puts the preparation/reagent blank back into the result.
17. The photocopy is unreadable. Therefore, the QA reviewer cannot read the laboratory's reported concentration result.
18. The reported value was qualified because the predigestion spike recovery was less than 75 %, but greater than 50%.
19. The reported value was qualified because the predigestion spike recovery was greater than 125 percent.
20. The non-detected value was qualified (UJ) because the redigestion spike recovery was less than 75 percent. The possibility of a false negative exists.
21. The reported result was qualified or rejected because the laboratory did not record the pH value(s) of the sample in a laboratory notebook.

22. The reported value was qualified (J/UJ) because the sample moisture content exceeded 50 percent.
23. The sample result was rejected because the soluble and insoluble matrix spike recoveries were less than 50%.
24. The detected sample result was qualified (J) because the incorrect spike concentration was used.
25. The reported sample results were rejected because the predigestion spike recovery was greater than 150 percent.
26. The reported sample results were rejected because the redigestion spike recovery was greater than 150 percent.
27. The reported value was qualified (J) because the redigestion spike recovery was less than 75 percent.
28. The reported value was qualified (J/UJ) because the sample digestion temperature was less than 90C.
29. In the Field Duplicate Sample Analysis, Hexavalent Chromium fell outside the control limits of $\leq 20\%$ for sample results $> 4xRL$ or $+ RL$ for sample results $< 4xRL$. Therefore, the result was qualified.
30. The reported value was qualified as estimated (J/UJ) but the bias is uncertain due to both high and low MS recoveries.
31. The reported result was greater than the MDL but less than the RL and qualified (J) as estimated by the laboratory.
32. The reported value was qualified because the sample replicate precision criterion of $\leq 20\%$ for method 7199 was exceeded.
33. The reported value was qualified (J/UJ) because the laboratory control sample (LCS) recovery was less than 80%.
34. The reported value was qualified (J) because the laboratory control sample (LCS) recovery was greater than 120%.
35. The reported result was qualified because the matrix spike analysis was not performed at the proper frequency.
36. The reported result was qualified because the laboratory duplicate analysis was not performed at the proper frequency.
37. The result was qualified because the cooler temperature upon sample receipt exceeded 6C.
38. The reported value was qualified because the redigestion spike recovery was greater than 125 percent.

39. The reported result was rejected because the laboratory failed to perform the reanalysis due to insufficient sample volume.
40. The reported results was qualified because the laboratory failed to analyze an ending CCB.
41. The reported result was qualified because the laboratory failed to make the proper method specific pH adjustment.
42. The reported result was rejected because the laboratory failed to reanalyze the MS and associated sample(s) due to failed MS recoveries.
43. The result was qualified due to negative instrument drift.

Soil Target Analyte Summary Hit List (Metals)

Site Name PPG Garfield Avenue Supplemental Remedial Investigation (GARIS) Forrest Street
Sampling Date April 8, 2014
Lab Name/ID Accutest, Dayton, NJ
SDG No JB64098A
Sample Matrix Soil
Trip Blank ID NA
Field Blank ID FS-FB20140408

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
FSI1-1.0-1.5	JB64098-1A	NICKEL	0.24	85.5	85.5	7.1		
FSI1-1.0-1.5	JB64098-1A	VANADIUM	U	44.8	44.8	8.9		
FSI1-1.0-1.5	JB64098-1A	CHROMIUM	0.11	73.6	73.6	8.9		
FSI1-1.0-1.5	JB64098-1A	THALLIUM	U	7.6B	7.6	8.9	Qualify	23

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

NJDEP Laboratory Footnote

1. The value reported is less than or equal to 3x the value in the method blank. It is the policy of NJDEP-DPFSR to negate the reported value due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
2. The value reported is greater than three (3) but less than ten (10) times the value in the method blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to the method blank contamination. The "B" qualifier alerts the end-user to the presence of this analyte in the method blank.
3. The value reported is less than or equal to 3x the value in the trip/field blank. It is the policy of NJDEP-DPFSR to negate the reported value as due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
4. The value reported is greater than 3x but less than ten (10) the value in the trip/field blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to trip/field blank contamination.

5. The concentration reported by the laboratory is incorrectly calculated.
6. The laboratory failed to report the presence of the analyte in the sample.
7. The reported metal value was qualified because the Calibration Verification Standard was not within the recovery range (90-110 percent).
8. In the MS/MSD Sample Analysis, this analyte fell outside the control limits of 20% RPD. Therefore, the result was qualified.
9. This analyte was qualified because the laboratory performed the MS/MSD Analysis on a field blank.
10. The reported analyte was qualified because the associated Calibration Blank result was greater than the MDL.
11. The reported value was qualified because serial dilution analysis was not within QC limit of 10% D.
12. This analyte is rejected because the laboratory exceeded the holding time for digestion and analysis.
13. The laboratory subtracted the method blank from the sample result. The reviewer's calculation has added the method blank result to the reported concentration.
14. The photocopy submitted is illegible. Therefore, the QA reviewer cannot read the laboratory's reported concentration result.
15. The reported or nondetected value was qualified because the MS/MSD spike recovery was less than 75 percent.
16. The reported value was qualified because the MS/MSD spike recovery was greater than 125 percent.
17. The reported value was qualified as estimated (J/UJ) but the bias is uncertain due to both high and low MS recoveries.
18. The reported values were qualified because the laboratory duplicate exceeded 35 percent RPD for results greater than 5X the reporting limit or the absolute difference exceeded two times the reporting limit for sample result less than 5 times the reporting limit.
19. The reported value was qualified because the field duplicate exceeded 35 percent RPD for results greater than 5X the reporting limit or the absolute difference exceeded two times the reporting limit for sample result less than 5 times the reporting limit.
20. The reported value was qualified because the LCS recovery was less than 80 percent.
21. The reported value was qualified because the sample moisture content was greater than 50 percent.

22. The reported value was rejected because the field duplicate absolute difference was greater than 4 times the RL or the RPD was greater than 120%.
23. The reported result was greater than the MDL but less than the RL and qualified (J) as estimated by the laboratory.
24. The field duplicate absolute difference exceeded two times the reporting limit for sample result less than 5 times the reporting limit.
25. The reported value was qualified because the LCS recovery was greater than 120 percent.

Attachment B

Data Validation Report Form

Client Name: PPG Industries	Project Number: 60154801.6001A
Site Location: PPG Garfield Avenue Supplemental Remedial Investigation (GARIS) Forrest Street Groundwater and Soil, Jersey City, NJ	Project Manager: William Spronz
Laboratory: Accutest, Dayton, NJ	Type of Validation: Full
Laboratory Job No: JB64098 and JB64098R	Date Checked: 5/17/14
Validator: Paula DiMattei	Peer: Lisa Krowitz

ITEM	YES	NO	N/A	COMMENTS
Sample results included?	X			
Reporting Limits met project requirements?	X			
Field I.D. included?	X			
Laboratory I.D. included?	X			
Sample matrix included?	X			
Sample receipt temperature 2-6C?	X			
Signed COCs included?	X			
Date of sample collection included?	X			
Date of sample digestion included?	X			
Holding time to digestion met criteria? (Soils -30 days from collection to digestion.)	X			
Date of analysis included?	X			
Holding time to analysis met criteria? (Soils -168 hours from digestion to analysis; Aqueous - 24 hours from collection to analysis.)	X			
Method reference included?	X			
Laboratory Case Narrative included?	X			

Definitions: MDL Method Detection Limit; %R Percent Recovery; RL Reporting Limit; RPD Relative Percent Difference; RSD Relative Standard Deviation :Corr Correlation Coefficient.

ITEM	YES	NO	N/A	COMMENTS
Initial calibration documentation included in lab package?	X			
1) Blank plus 4 standards (7196A) or blank plus 3 standards (7199)	X			
2) Correlation coefficient of =0.995 (7196A) or =0.999 (7199)	X			
3) Calibrate daily or each time instrument is set up.	X			
Calibration Check Standard (CCS) for 7196A and Quality Control Sample (QCS) for 7199 Included in Lab Package?	X			
1) %R criteria met? (90 - 110%)	X			
2) Correct frequency of one per every 10 samples	X			
3) CCS and QCS from independent source and at mid-level of calibration curve	X			
Calibration Blanks	X			
1) Analyzed prior to initial calibration standards and after each CCS/QCS?	X			
2) Absolute value should not exceed MDL.		X		see nonconformance table below
Method Blank, Field Blanks and/or Equipment Blanks Included in Lab Package?	X			FS-FB20140408
1) Method blank analyzed with each preparation batch?	X			
2) Absolute value should not exceed MDL.		X		see nonconformance table below
Eh and pH Data	X			
1) Eh and pH data was included and plotted for all samples?	X			
Soluble Matrix Spike Data Included in Lab Package?	X			
1) Soluble Matrix %R criteria met? (75-125%R).		X		See nonconformance table below.
2) Was the spike concentration 40 mg/Kg or twice the sample concentration?	X			
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	X			
Insoluble Matrix Spike Data Included in Lab Package?	X			
1) Insoluble Matrix %R criteria met? (75-125%R).		X		
2) Was the spike concentration around 400 to 800 mg/Kg?		X		Spiked at 1370 mg/kg and 1120 mg/kg. No impact to data.
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	X			

ITEM	YES	NO	N/A	COMMENTS
Post Digestion Spike	X			
1) Post Digestion Spike %R criteria met? (85-115%R).		X		See nonconformance table below.
2) Was the spike concentration 40 mg/Kg or twice the sample concentration?	X			
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	X			
Sample Duplicate Data Included in Lab Package?	X			FSI1-1.0-1.5
1) RPD criteria met? (RPD ≤20%) if both results are ≤4x RL or absolute difference ≤RL if either or both results are <4xRL.	X			
2) Was a sample duplicate analyzed at the frequency of 1 per batch or 20 samples?	X			
Was a Laboratory Control Sample (LCS) Included in Lab Package?	X			
1) %R criteria met? (80-120%R).	X			
2) Was an LCS analyzed at the frequency of 1/batch or 20 samples?	X			
Were any Field Duplicate samples submitted with this SDG?		X		
1) Were Field duplicate RPD criteria met? (RPD≤20% for both sample results >4xRL or absolute difference ≤ RL if either or both results are <4xRL.			X	
Were all sample quantitation and reporting requirements met?	X			
1) Were all solid samples reported with percent solids > 50% ?	X			
2) Were any samples analyzed or reported with dilutions?		X		
Miscellaneous Items	X			
1) For soils by 7196A, was the pH within a range of 7.0-8.0?	X			
2) For soils by 7199, was the pH within a range of 9.0-9.5?			X	
3) For aqueous by 7196A, was the pH with a range of 1.5-2.5?	X			
4) For soils (3060A), was the digestion temperature 90-95C for at least 60 minutes?	X			
5) For 7199, was each sample injected twice and was the RPD =20?			X	

Laboratory Blanks

Blank ID	Analyte	Result	QL	Units	Associated Samples
GN2745-MB1	CHROMIUM (HEXAVALENT)	-0.017	0.02	mg/L	FS-FB20140408

Matrix Spikes

Sample ID	Analyte	Analysis Batch	Matrix Spike	% Recovery	Lower Limit	Upper Limit	PDS	pH-adjusted PDS	PDS Limit
FSI1-1.0-1.5	CHROMIUM (HEXAVALENT)	GP79288/GN2955	Soluble	2.9	75	125	95.2		85-115
FSI1-1.0-1.5	CHROMIUM (HEXAVALENT)	GP79288/GN2955	Insoluble	73.2	75	125			
FSI1-1.0-1.5	CHROMIUM (HEXAVALENT)	GP79459/GN3386	Soluble	14.7	75	125	77.3	86	85-115
FSI1-1.0-1.5	CHROMIUM (HEXAVALENT)	GP79459/GN3386	Insoluble	74.2	75	125			

SDG#: JB64098
Batch: GN2955
 Cr+6 ICAL 04/11/14
 Soil
 (p. 37 of data pkg)

x - concentration	y - response
0	0
0.01	0.009
0.05	0.044
0.1	0.09
0.3	0.267
0.5	0.443
0.8	0.688
1	0.896

(p. 37 of data pkg)

AECOM Calculated Intercept	0.00004	OK	Reported intercept	0.00004
AECOM Slope	0.8829	OK	Reported Slope	0.8829
AECOM Calculated r	0.99968	OK	Reported r	0.99968

GP79288-B1
p.37

LCS calculation
 Background Absorbance 0
 Total absorbance 0.849
 Total absorbance - background 0.849
 Instrument Concentration 0.962
 Sample weight (mg/kg) 0.0025
 Final Volume (L) 0.1
 Dilution Factor 1

AECOM Calculated LCS Result (mg/Kg)	38.5	OK	Reported Result (mg/Kg)	38.5
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%R = Found/True*100 **p. 33**

True Value (mg/kg) 40

AECOM Calculated %R	96.2	OK rounding	Reported %R	96.3
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MS calculation **JB64098-1 [FSI1-1.0-1.5]p.19, 37**

Background reading 0
 Total absorbance 0.343
 Total absorbance - background 0.343
 Instrument Concentration 0.3885
 Sample weight (mg/kg) 0.00246
 Final Volume (L) 0.1
 Percent solids 0.577
 Dilution Factor 50

AECOM Calculated MS Result (mg/Kg)	1368	OK	Reported Result (mg/Kg)	1370
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%R = Found/True*100 **JB64098-1 [FSI1-1.0-1.5]p.19, 37**

True Value (mg/kg) 1870

Native concentration (mg/Kg) 1.3

AECOM%R	73.1	OK rounding	Reported %R	73.2
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Percent Solids **JB64098-1 [FSI1-1.0-1.5]p.20**

Empty dish weight= 20.14

Wet weight= 26.90

Dry weight= 24.04

AECOM%solids =	57.7	OK	reported %solids=	57.7
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Reporting Limit**JB64098-1 [FSI1-1.0-1.5]p.19**

Low Standard	0.01		
Initial weight (mg/kg)	0.00253		
Final volume (L)	0.1		
Percent solids	0.577		
Dilution Factor	1		
Reporting Limit	0.69	OK	Reported RL (mg/Kg)= 0.69

Sample Calculations**JB64098-1 [FSI1-1.0-1.5]p.19, 37**

Background reading	0.003		
Total absorbance	0.02		
Total absorbance - background	0.017		
Instrument Response	0.019		
Sample weight (mg/kg)	0.00253		
Final Volume (L)	0.1		
Percent solids	0.577		
Dilution Factor	1		
AECOM Calculated Result (mg/Kg)	1.3	OK	Reported Result (mg/Kg) 1.3

Client Name: PPG Industries	Project Number: 60154801.6001A
Site Location: PPG Garfield Avenue Supplemental Remedial Investigation (GARIS) Forrest Street Groundwater and Soil, Jersey City, NJ	Project Manager: William Spronz
Laboratory: Accutest, Dayton, NJ	Type of Validation: Limited
Laboratory Job No: JB64098A	Date Checked: 5/17/14
Validator: Paula DiMattei	Peer: Lisa Krowitz

ITEM	YES	NO	N/A	COMMENTS
Sample results included?	X			
Reporting Limits met project requirements?	X			
Field I.D. included?	X			
Laboratory I.D. included?	X			
Sample matrix included?	X			
Sample receipt temperature 2-6C?	X			
Signed COCs included?	X			
Date of sample collection included?	X			
Date of sample digestion included?	X			
Date of analysis included?	X			
Holding time met QC criteria? (Metals -180 days from sample collection; Mercury - 28 days from sample collection. If HT exceeded by 10 days R all results.	X			
Method reference included?	X			
Laboratory Case Narrative included?	X			

Definitions: MDL Method Detection Limit; %R Percent Recovery; RL Reporting Limit; RPD Relative Percent Difference; RSD Relative Standard Deviation :Corr Correlation Coefficient.

ITEM	YES	NO	N/A	COMMENTS
Sample dilutions?	X			
Initial calibration documentation included in lab package?			X	NA for a Limited review
1) Calibrate daily or each time instrument is set up.			X	
2) ICP (6010) -Blank plus 1 standard? If no, reject (R) data.			X	
3) Hg (7470/7471) -Blank plus 5 standards? If no, reject (R) data.			X	
Initial Calibration Verification Standard (ICV) for ICP (6010) and Initial Calibration Check Standard (ICCS) for Hg (7470/7471) included in lab package?			X	
1) Analyzed immediately after initial calibration? If no, reject (R) data.			X	
2) %R criteria met? (90-110%). If no, J positive results for affected analyte(s) if %R between 80-89% and 111-120% and indicate bias; UJ non-detect results for affected analyte(s) if %R between 80-89% , and R all data for affected analyte(s) if %R 120%.			X	
3) Spot check ICV/ICCS results for several analytes.			X	
Continuing Calibration Verification Standard (CCV) for ICP (6010) and Calibration Check Standard (CCS) for Hg (7470/7471) included in Lab Package?			X	
1) Analyzed immediately after each ICV/ICC/CB and after every 10 samples? If no, reject (R) data.			X	
2) CCS and CCV from independent source and at mid-level of calibration curve. If no, reject (R) data.			X	
3) %R criteria met? (90-110%R). If no, J positive results for affected analyte(s) if %R between 80-89% and 111-120% and indicate bias; UJ non-detect results for affected analyte(s) if %R between 80-89% and R all data for affected analyte(s) if %R 120%.			X	
4) Spot check CCV/CCS results for several analytes.			X	
Low Calibration Standard (CRI) included in Lab Package?			X	
1) %R criteria met? - 50-150% for Co, Mn, Zn, by ICP-MS; Pb, Ti by 6010; 70-130% all others. If no, refer to ILM05.4 NJ SOP 5.A.2 for actions.			X	

ITEM	YES	NO	N/A	COMMENTS
Calibration Blanks			X	NA for a Limited review
1) Analyzed after daily calibration and after each ICV/ICC/CCV/CCS and after every 10 samples? If no, reject (R) data.			X	
2) Absolute value 10xCB result, no qualification.			X	
Method Blank Included in Lab Package?	X			
1) Method blank analyzed with each preparation batch or every SDG, or 1/20 samples? If no, reject (R) data, except no aqueous MB required for FB/EB if only soil samples were analyzed.	X			
2) Method blank analyzed 1/20 samples? If - MB 1/25, J sample results from 21-25; -MB >1/25, R sample results after 25th sample.	X			
3) MB results nondetect? If no, -sample result 3xMB but 10xMB, no qualification.		X		See nonconformance table below
4) Negative MB result reported? If yes, -Positive sample result		X		
Field Blanks/Equipment Blanks Included in Lab Package?	X			FS-FB20140408
1) FB/EB result non-detect? If no, -sample result 3xFB/EB but 10xFB/EB, no qualification.		X		
ICP Interference Check Sample (ICS) included in Lab Package?			X	NA for a Limited review
1) Analyzed at beginning of analytical run? If no, reject (R) data.			X	
2) %R criteria met? (80-120%) If no, %R>120%, no qualification if sample result non-detect; %R between 121-150%, J positive results, biased high; %R between 50-79%, J/UJ results, biased low; %R150%, reject (R) result			X	
3) Spot check accuracy of %Rs			X	
Matrix Spike/Matrix Spike Duplicate Data Included in Lab Package?	X			Batch QC for both soil and AQ. batch QC was not assessed
1) MS/MSD %R (75-125%R) and RPD (+20%) criteria met? - %R>125% J positive results for affected analyte(s) for all samples in the same batch/SDG, accept NDs; -%R			X	
2) Was a sample spiked at the frequency of 1/batch or 20 samples?			X	
3) Was the MS performed on a site sample?			X	
4) Was the MS performed on a FB/EB or TB? If yes, J all sample data.			X	

ITEM	YES	NO	N/A	COMMENTS
Post Digestion Spike			X	NA for a Limited review
1) %R criteria met? (75-125%R) - %R>125% J positive results for affected analyte(s) for all samples in the same batch/SDG, accept NDs.; - %R			X	
2) Was the spike performed on a FB/EB or TB? If yes, J all sample data.			X	
3) Was a sample spiked at the frequency of 1/batch or 20 samples?			X	
Laboratory Duplicate Data Included in Lab Package?		X		MS/MSD analyses were performed in lieu of a laboratory duplicate analysis.
Aqueous - If RPD is >20% but 5x the QL, estimate (J) results >the QL. - If RPD is >100%, reject R results >= the QL.- If sample and/or duplicate is the QL, estimate (J) positive results 2x the QL, reject R non-detects and positive results			X	
Soil - If RPD is >35% but 5x the QL, estimate (J) results > the QL. - If RPD is >120%, reject results > the QL. - If sample and/or duplicate is 2x the QL, estimate (J) positive results 4x the QL, reject nondetects and positive results			X	
Was a Laboratory Control Sample (LCS) Included in Lab Package?	X			
1) LCS %R criteria met? (80-120%R). If no, J/UJ all affected analytes(s) for all samples in the same batch/SDG.	X			
2) Was an LCS analyzed at the frequency of 1/batch or 20 samples? If no, J/UJ affected analyte(s) for all samples in the same batch/SDG.	X			
Serial Dilution			X	NA for a Limited review
1) %D(25xIDL (7000) or >10xIDL (6010) and %D >10% J positive results for affected analyte(s) for all samples in the same batch/SDG, accept NDs.			X	
2) Was the frequency 1/batch or 20 samples?			X	
3) Was a site sample used?			X	
4) Was a FB/EB or TB used? If yes, J all sample data.			X	
5) Spot check accuracy of %Ds.			X	

ITEM	YES	NO	N/A	COMMENTS
Field Duplicate Data included in Lab Package?		X		
Aqueous - If RPD is >20% but 5x the QL, estimate (J) results > the QL. - If RPD is >100%, reject R results >= the QL. - If sample and/or duplicate is the QL, estimate (J) positive results 2x the QL, reject R non-detects and positive results			X	
Soil - If RPD is >35% but 5x the QL, estimate (J) results > the QL. - If RPD is >120%, reject results > the QL. - If sample and/or duplicate is 2x the QL, estimate (J) positive results 4x the QL, reject nondetects and positive results			X	
Percent Solids data included in Lab Package?	X			
1) %Solids criteria (Reg 2 criteria) met? (>=50%)	X			

Laboratory Blanks

Blank ID	Analyte	Result	QL	Units	Associated Samples
MP78836-MB1	Chromium	0.11	0.93	mg/kg	FSI1-1.0-1.5
	Nickel	0.24	3.7	mg/kg	

Data Validation Report

Project:	PPG Garfield Avenue Supplemental Remedial Investigation (GARIS) Forrest Street Groundwater and Concrete	
Laboratory:	Accutest, Dayton, NJ	
Laboratory Job No.:	JB64216 and JB64216A	
Analysis/Method:	Hexavalent Chromium SW846 3060A/7196 Metals by ICP-AES/ SW846-6010	
Validation Level:	Full (Hexavalent chromium) Limited (Metals)	
Site Location/Address:	Forrest Street, Jersey City, NJ	
AECOM Project No:	60154801.6001A	
Prepared by:	Paula DiMattei /AECOM	Completed on: 05/19/2014
Reviewed by:	Lisa Krowitz /AECOM	File Name: JB64216_A_2014-05-19_DV Report-ID

Introduction

The data were reviewed in accordance with the FSP-QAPP and the following NJDEP validation Standard Operating Procedures (SOP):

- NJDEP Office of Data Quality SOP 5.A.10, Rev 3 (September 2009), SOP for Analytical Data Validation of Hexavalent Chromium - for USEPA SW-846 Method 3060A, USEPA SW-846 Method 7196A and USEPA SW-846 Method 7199;
- NJDEP Office of Data Quality SOP 5.A.16, Rev 1 (May 2002), Quality Assurance Data Validation of Analytical Deliverables for Inorganics (based on USEPA SW-846 Methods)

The results of quality control data analyzed with site samples were used to assess the overall reliability of the data. The following qualifiers were used to identify data quality issues:

- U: Indicates the analyte was not detected in the sample above the sample reporting limit.
- J: Indicates the result was an estimated value; the associated numerical value was an approximate concentration of the analyte in the sample.
- UJ: Indicates the analyte was not detected above the reporting limit and the reporting limit was approximate.
- R: The sample result was rejected due to serious deficiencies; the presence or absence of the analyte could not be confirmed.
- RA: The sample result was rejected but is still considered usable.

Sample Information

The samples listed below were collected by AECOM on April 9, 2014 as part of the PPG Garfield Avenue Supplemental Remedial Investigation (GARIS) Forrest Street Groundwater and Concrete sampling at the PPG Forrest Street, Jersey City, NJ. Only the samples and parameters listed below were validated.

Field ID	Laboratory ID	Matrix	Fraction
FS-FB20140409 (Equipment Blank)	JB64216-12	Aqueous	Hexavalent Chromium
FS-FB20140409 (Equipment Blank)	JB64216-12A	Aqueous	Metals
FSI1A-CB	JB64216-4	Concrete	Hexavalent Chromium
FSI1A-CB	JB64216-4A	Concrete	Metals
FSI1A-CT	JB64216-3	Concrete	Hexavalent Chromium
FSI1A-CT	JB64216-3A	Concrete	Metals
FSI1B-CB	JB64216-6	Concrete	Hexavalent Chromium
FSI1B-CB	JB64216-6A	Concrete	Metals
FSI1B-CT	JB64216-5	Concrete	Hexavalent Chromium
FSI1B-CT	JB64216-5A	Concrete	Metals
FSI1-CB	JB64216-2	Concrete	Hexavalent Chromium
FSI1-CB	JB64216-2A	Concrete	Metals
FSI1C-CB	JB64216-8	Concrete	Hexavalent Chromium
FSI1C-CB	JB64216-8A	Concrete	Metals
FSI1C-CT	JB64216-7	Concrete	Hexavalent Chromium
FSI1C-CT	JB64216-7A	Concrete	Metals
FSI1-CT	JB64216-1	Concrete	Hexavalent Chromium
FSI1-CT	JB64216-1A	Concrete	Metals
FSI2-CM	JB64216-10	Concrete	Hexavalent Chromium
FSI2-CM	JB64216-10A	Concrete	Metals
FSI2-CT	JB64216-9	Concrete	Hexavalent Chromium
FSI2-CT	JB64216-9A	Concrete	Metals
FSI2GW	JB64216-11	Ground Water	Hexavalent Chromium
FSI2GW	JB64216-11A	Ground Water	Metals

The samples were collected following the procedures detailed in the Remedial Investigation Work Plan - Soil for Non-Residential Chromate Chemical Production Waste Sites 114, 132, 133, 135, 137, 143, and 186, Jersey City, New Jersey, or applicable proposal or work plan, and the Field Sampling Plan/Quality Assurance Project Plan for Non-Residential and Residential Chromium Sites Hudson County, New Jersey (December 2011).

General Comments

The data package was complete. Quality control (QC) issues identified during validation are discussed below. Refer to the Target Analyte Summary Hit(s) in Attachment A for a listing of all detected results, qualified results, and associated qualifications, where applicable. The nonconformances for each section discussed below are presented in Attachment B.

Hexavalent Chromium

Laboratory Blanks/Equipment Blanks

Method Blank

Negative drift for hexavalent chromium was detected in the continuing calibration blanks (CCBs) and the method blank, at comparable amounts, impacting the groundwater sample and equipment blank in this SDG. The nondetect hexavalent chromium results for the groundwater sample and the equipment blank were qualified as estimated (UJ).

MS Results

Sample FSI2GW (JB64216-11) was selected for the matrix spike (MS) analysis associated with the groundwater samples in this SDG and was used for supporting data quality recommendations. The MS recovery was 46.6%, which did not meet the quality control (QC) criteria of 85-115%. The positive hexavalent chromium result in groundwater sample FSI2GW was qualified as estimated (J).

Sample FSI2-CM (JB64216-10) was selected for the MS analysis associated with the concrete samples in this SDG and was used for supporting data quality recommendations. The soluble and insoluble MS recoveries were 80.3% and 85.8%, respectively; which met the QC criteria of 75-125%. The PDS recovery was 96%, which met the PDS criteria of 85-115%. No data qualification was required on the basis of spike recoveries.

Laboratory Duplicate Precision

Sample FSI2-CM (JB64216-10) was selected by the laboratory to demonstrate laboratory precision capabilities for the concrete samples.

The relative percent difference (RPD) for hexavalent chromium exceeded the QC acceptance RPD; therefore, the hexavalent chromium results in the concrete samples were qualified as estimated (J).

Sample Results

The concentration for hexavalent chromium for the laboratory duplicate analysis of the concrete sample FSI2-CM was reported as 21.8 mg/kg. Professional judgment was used to take a conservative approach by reporting the result for sample FSI2-CM as 21.8 mg/kg rather than the original reported result of 17.5 mg/kg since the value reported from the laboratory duplicate exceeded the project action limit of 20 mg/kg while the original result sample was slightly below the project action limit.

Reported results (flagged B by the laboratory) that were less than the reporting limit (RL), but greater than or equal to the method detection limit (MDL) are approximate values and have been qualified as estimated (J).

Metals

Laboratory Blanks/Equipment Blanks

Method Blank

Chromium was detected in the method blank (MP78860-MB1) associated with the concrete samples in this SDG, at a concentration above the MDL, but below the RL. Since the results for chromium in the associated concrete samples were greater than ten times the amount detected in the method blank, no qualifications were required.

Data Quality and Usability

In general, these data appear to be valid and may be used for decision-making purposes. No data were rejected. Qualified results, if applicable, are presented in Attachments A and B.

The hexavalent chromium results in the aqueous samples are usable as estimated values with potential low bias due to negative instrument drift.

The hexavalent chromium groundwater result in this SDG is usable as an estimated value with the potential for low bias due to the low MS recovery.

The hexavalent chromium results for the concrete samples in this SDG are usable as estimated values with an unknown bias due to laboratory duplicate imprecision.

The concentration for hexavalent chromium for the laboratory duplicate analysis of the concrete sample FS12-CM was reported as 21.8 mg/kg. Professional judgment was used to take a conservative approach by reporting the result for sample FS12-CM as 21.8 mg/kg rather than the original reported result of 17.5 mg/kg since the value reported from the laboratory duplicate exceeded the project action limit of 20 mg/kg while the original result sample is slightly below the project action limit.

Sample results reported between the MDL and RL are usable as estimated values with an unknown directional bias.

ATTACHMENTS

Attachment A: Target Analyte Summary Hitlist(s)

Attachment B: Data Validation Report Form

Attachment A

Target Analyte Summary Hitlist(s)

Solid Target Analyte Summary Hit List (Hexavalent Chromium)

Site Name PPG Garfield Avenue Supplemental Remedial Investigation (GARIS) Forrest Street
Sampling Date April 9, 2014
Lab Name/ID Accutest, Dayton, NJ
SDG No JB64216
Sample Matrix Concrete
Trip Blank ID NA
Field Blank ID FS-FB20140409

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
FSI1-CB	JB64216-2	CHROMIUM (HEXAVALENT)	U	0.50	0.50	0.41	Qualify	8
FSI1-CT	JB64216-1	CHROMIUM (HEXAVALENT)	U	0.94	0.94	0.41	Qualify	8
FSI1A-CB	JB64216-4	CHROMIUM (HEXAVALENT)	U	1.5	1.5	0.42	Qualify	8
FSI1A-CT	JB64216-3	CHROMIUM (HEXAVALENT)	U	1.0	1.0	0.41	Qualify	8
FSI1B-CB	JB64216-6	CHROMIUM (HEXAVALENT)	U	0.38B	0.38	0.41	Qualify	8,31
FSI1B-CT	JB64216-5	CHROMIUM (HEXAVALENT)	U	0.73	0.73	0.42	Qualify	8
FSI1C-CB	JB64216-8	CHROMIUM (HEXAVALENT)	U	0.76	0.76	0.41	Qualify	8
FSI1C-CT	JB64216-7	CHROMIUM (HEXAVALENT)	U	1.2	1.2	0.41	Qualify	8
FSI2-CM	JB64216-10	CHROMIUM (HEXAVALENT)	U	17.5	21.8	0.46	Qualify	8
FSI2-CT	JB64216-9	CHROMIUM (HEXAVALENT)	U	11.4	11.4	0.43	Qualify	8

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

NJDEP Laboratory Footnote

1. The value reported is less than or equal to 3x the value in the preparation/reagent blank. It is the policy of NJDEP-DPFSR to negate the reported value due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.

2. The value reported is greater than three (3) times but less than ten (10) times the value in the preparation/reagent blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to the preparation/reagent blank contamination. The "B" qualifier alerts the end-user to the presence of this analyte in the preparation/reagent blank.
3. The value reported is less than or equal to three (3) times the value in the trip/field blank. It is the policy of NJDEP-DPF SR to negate the reported value as due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
4. The value reported is greater than three (3) times but less than ten (10) times the value in the trip/field blanks and is considered "real". However, the reported value must be quantitatively qualified "J" due to trip/field blank contamination.
5. The concentration reported by the laboratory is incorrectly calculated.
6. The laboratory failed to report the presence of the analyte in the sample.
7. The reported Hexavalent Chromium value was qualified because the Calibration Check Standard was not within the recovery range (90-110 percent).
8. In the Duplicate Sample Analysis, Hexavalent Chromium fell outside the control limits of ≤ 20 percent for sample results $> 4xRL$ or $+ RL$ for sample results $< 4xRL$. Therefore, the result was qualified.
9. This analyte was rejected because the laboratory performed the Duplicate Analysis on a field blank.
10. The reported value was qualified because the PVS recovery was greater than 115 percent.
11. The reported value was qualified because the PVS recovery was less than 85 percent.
12. The non-detected value was qualified (UJ) because the PVS recovery was less than 85 percent. The possibility of a false negative exists.
13. The reported analyte was qualified because the associated Calibration Blank result was greater than the MDL.
14. The laboratory made a transcription error. No hits were found in the raw data.
15. This analyte is qualified or rejected because the laboratory exceeded the holding time for digestion and/or analysis.

16. The laboratory subtracted the preparation/reagent blank from the sample result. The Reviewer's calculation puts the preparation/reagent blank back into the result.
17. The photocopy is unreadable. Therefore, the QA reviewer cannot read the laboratory's reported concentration result.
18. The reported value was qualified because the predigestion spike recovery was less than 75 %, but greater than 50%.
19. The reported value was qualified because the predigestion spike recovery was greater than 125 percent.
20. The non-detected value was qualified (UJ) because the redigestion spike recovery was less than 75 percent. The possibility of a false negative exists.
21. The reported result was qualified or rejected because the laboratory did not record the pH value(s) of the sample in a laboratory notebook.
22. The reported value was qualified (J/UJ) because the sample moisture content exceeded 50 percent.
23. The sample result was rejected because the soluble and insoluble matrix spike recoveries were less than 50%.
24. The detected sample result was qualified (J) because the incorrect spike concentration was used.
25. The reported sample results were rejected because the predigestion spike recovery was greater than 150 percent.
26. The reported sample results were rejected because the redigestion spike recovery was greater than 150 percent.
27. The reported value was qualified (J) because the redigestion spike recovery was less than 75 percent.
28. The reported value was qualified (J/UJ) because the sample digestion temperature was less than 90C.
29. In the Field Duplicate Sample Analysis, Hexavalent Chromium fell outside the control limits of $\leq 20\%$ for sample results $> 4xRL$ or $+ RL$ for sample results $< 4xRL$. Therefore, the result was qualified.
30. The reported value was qualified as estimated (J/UJ) but the bias is uncertain due to both high and low MS recoveries.
31. The reported result was greater than the MDL but less than the RL and qualified (J) as estimated by the laboratory.

32. The reported value was qualified because the sample replicate precision criterion of $\leq 20\%$ for method 7199 was exceeded.
33. The reported value was qualified (J/UJ) because the laboratory control sample (LCS) recovery was less than 80%.
34. The reported value was qualified (J) because the laboratory control sample (LCS) recovery was greater than 120%.
35. The reported result was qualified because the matrix spike analysis was not performed at the proper frequency.
36. The reported result was qualified because the laboratory duplicate analysis was not performed at the proper frequency.
37. The result was qualified because the cooler temperature upon sample receipt exceeded 6C.
38. The reported value was qualified because the redigestion spike recovery was greater than 125 percent.
39. The reported result was rejected because the laboratory failed to perform the reanalysis due to insufficient sample volume.
40. The reported results was qualified because the laboratory failed to analyze an ending CCB.
41. The reported result was qualified because the laboratory failed to make the proper method specific pH adjustment.
42. The reported result was rejected because the laboratory failed to reanalyze the MS and associated sample(s) due to failed MS recoveries.
43. The result was qualified due to negative instrument drift.

Aqueous Target Analyte Summary Hit List (Hexavalent Chromium)

Site Name PPG Garfield Avenue Supplemental Remedial Investigation (GARIS) Forrest Street
Sampling Date April 9, 2014
Lab Name/ID Accutest, Dayton, NJ
SDG No JB64216
Sample Matrix Groundwater
Trip Blank ID NA
Field Blank ID NA

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/L)	Laboratory Sample Result (mg/L)	Validation Sample Result (mg/L)	RL (mg/L)	Quality Assurance Decision	NJDEP Validation Footnote
FS-FB20140409	JB64216-12	CHROMIUM (HEXAVALENT)	-0.004	U	U	0.010	Qualify	43
FSI2GW	JB64216-11	CHROMIUM (HEXAVALENT)	-0.004	11.7	11.7	1.0	Qualify	11,43

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

NJDEP Laboratory Footnote

1. The value reported is less than or equal to 3x the value in the preparation/reagent blank. It is the policy of NJDEP-DPFSR to negate the reported value due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
2. The value reported is greater than three (3) times but less than ten (10) times the value in the preparation/reagent blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to the preparation/reagent blank contamination. The "B" qualifier alerts the end-user to the presence of this analyte in the preparation/reagent blank.
3. The value reported is less than or equal to three (3) times the value in the trip/field blank. It is the policy of NJDEP-DPFSR to negate the reported value as due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
4. The value reported is greater than three (3) times but less than ten (10) times the value in the trip/field blanks and is considered "real". However, the reported value must be quantitatively qualified "J" due to trip/field blank contamination.
5. The concentration reported by the laboratory is incorrectly calculated.

6. The laboratory failed to report the presence of the analyte in the sample.
7. The reported Hexavalent Chromium value was qualified because the Calibration Check Standard was not within the recovery range (90-110 percent).
8. In the Duplicate Sample Analysis, Hexavalent Chromium fell outside the control limits of ≤ 20 percent for sample results $> 4xRL$ or $+ RL$ for sample results $< 4xRL$. Therefore, the result was qualified.
9. This analyte was rejected because the laboratory performed the Duplicate Analysis on a field blank.
10. The reported value was qualified because the PVS recovery was greater than 115 percent.
11. The reported value was qualified because the PVS recovery was less than 85 percent.
12. The non-detected value was qualified (UJ) because the PVS recovery was less than 85 percent. The possibility of a false negative exists.
13. The reported analyte was qualified because the associated Calibration Blank result was greater than the MDL.
14. The laboratory made a transcription error. No hits were found in the raw data.
15. This analyte is qualified or rejected because the laboratory exceeded the holding time for digestion and/or analysis.
16. The laboratory subtracted the preparation/reagent blank from the sample result. The Reviewer's calculation puts the preparation/reagent blank back into the result.
17. The photocopy is unreadable. Therefore, the QA reviewer cannot read the laboratory's reported concentration result.
18. The reported value was qualified because the predigestion spike recovery was less than 75 %, but greater than 50%.
19. The reported value was qualified because the predigestion spike recovery was greater than 125 percent.
20. The non-detected value was qualified (UJ) because the redigestion spike recovery was less than 75 percent. The possibility of a false negative exists.
21. The reported result was qualified or rejected because the laboratory did not record the pH value(s) of the sample in a laboratory notebook.

22. The reported value was qualified (J/UJ) because the sample moisture content exceeded 50 percent.
23. The sample result was rejected because the soluble and insoluble matrix spike recoveries were less than 50%.
24. The detected sample result was qualified (J) because the incorrect spike concentration was used.
25. The reported sample results were rejected because the predigestion spike recovery was greater than 150 percent.
26. The reported sample results were rejected because the redigestion spike recovery was greater than 150 percent.
27. The reported value was qualified (J) because the redigestion spike recovery was less than 75 percent.
28. The reported value was qualified (J/UJ) because the sample digestion temperature was less than 90C.
29. In the Field Duplicate Sample Analysis, Hexavalent Chromium fell outside the control limits of $\leq 20\%$ for sample results $> 4xRL$ or $+ RL$ for sample results $< 4xRL$. Therefore, the result was qualified.
30. The reported value was qualified as estimated (J/UJ) but the bias is uncertain due to both high and low MS recoveries.
31. The reported result was greater than the MDL but less than the RL and qualified (J) as estimated by the laboratory.
32. The reported value was qualified because the sample replicate precision criterion of $\leq 20\%$ for method 7199 was exceeded.
33. The reported value was qualified (J/UJ) because the laboratory control sample (LCS) recovery was less than 80%.
34. The reported value was qualified (J) because the laboratory control sample (LCS) recovery was greater than 120%.
35. The reported result was qualified because the matrix spike analysis was not performed at the proper frequency.
36. The reported result was qualified because the laboratory duplicate analysis was not performed at the proper frequency.
37. The result was qualified because the cooler temperature upon sample receipt exceeded 6C.
38. The reported value was qualified because the redigestion spike recovery was greater than 125 percent.

39. The reported result was rejected because the laboratory failed to perform the reanalysis due to insufficient sample volume.
40. The reported results was qualified because the laboratory failed to analyze an ending CCB.
41. The reported result was qualified because the laboratory failed to make the proper method specific pH adjustment.
42. The reported result was rejected because the laboratory failed to reanalyze the MS and associated sample(s) due to failed MS recoveries.
43. The result was qualified due to negative instrument drift.

Solid Target Analyte Summary Hit List (Metals)

Site Name PPG Garfield Avenue Supplemental Remedial Investigation (GARIS) 98 Forrest Street
Sampling Date April 9, 2014
Lab Name/ID Accutest, Dayton, NJ
SDG No JB64216A
Sample Matrix Concrete
Trip Blank ID NA
Field Blank ID FS-FB20140409

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
FSI1-CB	JB64216-2A	CHROMIUM	0.095	8.1	8.1	1.0		
FSI1-CT	JB64216-1A	CHROMIUM	0.095	8.3	8.3	1.0		
FSI1A-CB	JB64216-4A	CHROMIUM	0.095	11.6	11.6	1.1		
FSI1A-CT	JB64216-3A	CHROMIUM	0.095	13.5	13.5	1.1		
FSI1B-CB	JB64216-6A	CHROMIUM	0.095	10.7	10.7	1.0		
FSI1B-CT	JB64216-5A	CHROMIUM	0.095	20.6	20.6	1.1		
FSI1C-CB	JB64216-8A	CHROMIUM	0.095	5.8	5.8	1.0		
FSI1C-CT	JB64216-7A	CHROMIUM	0.095	10.6	10.6	1.0		
FSI2-CM	JB64216-10A	CHROMIUM	0.095	68.7	68.7	1.2		
FSI2-CT	JB64216-9A	CHROMIUM	0.095	48.2	48.2	1.1		

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

NJDEP Laboratory Footnote

- The value reported is less than or equal to 3x the value in the method blank. It is the policy of NJDEP-DPFSR to negate the reported value due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.

2. The value reported is greater than three (3) but less than ten (10) times the value in the method blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to the method blank contamination. The "B" qualifier alerts the end-user to the presence of this analyte in the method blank.
3. The value reported is less than or equal to 3x the value in the trip/field blank. It is the policy of NJDEP-DPF SR to negate the reported value as due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
4. The value reported is greater than 3x but less than ten (10) the value in the trip/field blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to trip/field blank contamination.
5. The concentration reported by the laboratory is incorrectly calculated.
6. The laboratory failed to report the presence of the analyte in the sample.
7. The reported metal value was qualified because the Calibration Verification Standard was not within the recovery range (90-110 percent).
8. In the MS/MSD Sample Analysis, this analyte fell outside the control limits of 20% RPD. Therefore, the result was qualified.
9. This analyte was qualified because the laboratory performed the MS/MSD Analysis on a field blank.
10. The reported analyte was qualified because the associated Calibration Blank result was greater than the MDL.
11. The reported value was qualified because serial dilution analysis was not within QC limit of 10% D.
12. This analyte is rejected because the laboratory exceeded the holding time for digestion and analysis.
13. The laboratory subtracted the method blank from the sample result. The reviewer's calculation has added the method blank result to the reported concentration.
14. The photocopy submitted is illegible. Therefore, the QA reviewer cannot read the laboratory's reported concentration result.
15. The reported or nondetected value was qualified because the MS/MSD spike recovery was less than 75 percent.
16. The reported value was qualified because the MS/MSD spike recovery was greater than 125 percent.

17. The reported value was qualified as estimated (J/UJ) but the bias is uncertain due to both high and low MS recoveries.
18. The reported values were qualified because the laboratory duplicate exceeded 35 percent RPD for results greater than 5X the reporting limit or the absolute difference exceeded two times the reporting limit for sample result less than 5 times the reporting limit.
19. The reported value was qualified because the field duplicate exceeded 35 percent RPD for results greater than 5X the reporting limit or the absolute difference exceeded two times the reporting limit for sample result less than 5 times the reporting limit.
20. The reported value was qualified because the LCS recovery was less than 80 percent.
21. The reported value was qualified because the sample moisture content was greater than 50 percent.
22. The reported value was rejected because the field duplicate absolute difference was greater than 4 times the RL or the RPD was greater than 120%.
23. The reported result was greater than the MDL but less than the RL and qualified (J) as estimated by the laboratory.
24. The field duplicate absolute difference exceeded two times the reporting limit for sample result less than 5 times the reporting limit.
25. The reported value was qualified because the LCS recovery was greater than 120 percent.

Aqueous Target Analyte Summary Hit List (Metals)

Site Name PPG Garfield Avenue Supplemental Remedial Investigation (GARIS) 98 Forrest Street
Sampling Date April 9, 2014
Lab Name/ID Accutest, Dayton, NJ
SDG No JB64216A
Sample Matrix Groundwater
Trip Blank ID NA
Field Blank ID NA

Field Sample ID	Lab Sample ID	Analyte	Method Blank (ug/L)	Laboratory Sample Result (ug/L)	Validation Sample Result (ug/L)	RL (ug/L)	Quality Assurance Decision	NJDEP Validation Footnote
FSI2GW	JB64216-11A	CHROMIUM	U	14200	14200	10		

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

NJDEP Laboratory Footnote

1. The value reported is less than or equal to 3x the value in the method blank. It is the policy of NJDEP-DPFSR to negate the reported value due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
2. The value reported is greater than three (3) but less than ten (10) times the value in the method blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to the method blank contamination. The "B" qualifier alerts the end-user to the presence of this analyte in the method blank.
3. The value reported is less than or equal to 3x the value in the trip/field blank. It is the policy of NJDEP-DPFSR to negate the reported value as due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
4. The value reported is greater than 3x but less than ten (10) the value in the trip/field blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to trip/field blank contamination.
5. The concentration reported by the laboratory is incorrectly calculated.
6. The laboratory failed to report the presence of the analyte in the sample.

7. The reported metal value was qualified because the Calibration Verification Standard was not within the recovery range (90-110 percent).
8. In the MS/MSD Sample Analysis, this analyte fell outside the control limits of 20% RPD. Therefore, the result was qualified.
9. This analyte was qualified because the laboratory performed the MS/MSD Analysis on a field blank.
10. The reported analyte was qualified because the associated Calibration Blank result was greater than the MDL.
11. The reported value was qualified because serial dilution analysis was not within QC limit of 10% D.
12. This analyte is rejected because the laboratory exceeded the holding time for digestion and analysis.
13. The laboratory subtracted the method blank from the sample result. The reviewer's calculation has added the method blank result to the reported concentration.
14. The photocopy submitted is illegible. Therefore, the QA reviewer cannot read the laboratory's reported concentration result.
15. The reported or nondetected value was qualified because the MS/MSD spike recovery was less than 75 percent.
16. The reported value was qualified because the MS/MSD spike recovery was greater than 125 percent.
17. The reported value was qualified as estimated (J/UJ) but the bias is uncertain due to both high and low MS recoveries.
18. The reported values were qualified because the laboratory duplicate exceeded 35 percent RPD for results greater than 5X the reporting limit or the absolute difference exceeded two times the reporting limit for sample result less than 5 times the reporting limit.
19. The reported value was qualified because the field duplicate exceeded 35 percent RPD for results greater than 5X the reporting limit or the absolute difference exceeded two times the reporting limit for sample result less than 5 times the reporting limit.
20. The reported value was qualified because the LCS recovery was less than 80 percent.
21. The reported value was qualified because the sample moisture content was greater than 50 percent.
22. The reported value was rejected because the field duplicate absolute difference was greater than 4 times the RL or the RPD was greater than 120%.

23. The reported result was greater than the MDL but less than the RL and qualified (J) as estimated by the laboratory.
24. The field duplicate absolute difference exceeded two times the reporting limit for sample result less than 5 times the reporting limit.
25. The reported value was qualified because the LCS recovery was greater than 120 percent.

Attachment B

Data Validation Report Form

Client Name: PPG Industries	Project Number: 60154801.6001A
Site Location: PPG Garfield Avenue Supplemental Remedial Investigation (GARIS) Forrest Street Groundwater and Concrete, Jersey City, NJ	Project Manager: William Spronz
Laboratory: Accutest, Dayton, NJ	Type of Validation: Full
Laboratory Job No: JB64216	Date Checked: 5/19/14
Validator: Paula DiMattei	Peer: Lisa Krowitz

ITEM	YES	NO	N/A	COMMENTS
Sample results included?	X			
Reporting Limits met project requirements?	X			
Field I.D. included?	X			
Laboratory I.D. included?	X			
Sample matrix included?	X			
Sample receipt temperature 2-6C?	X			
Signed COCs included?	X			
Date of sample collection included?	X			
Date of sample digestion included?	X			
Holding time to digestion met criteria? (Soils -30 days from collection to digestion.)	X			
Date of analysis included?	X			
Holding time to analysis met criteria? (Soils -168 hours from digestion to analysis; Aqueous - 24 hours from collection to analysis.	X			
Method reference included?	X			
Laboratory Case Narrative included?	X			

Definitions: MDL Method Detection Limit; %R Percent Recovery; RL Reporting Limit; RPD Relative Percent Difference; RSD Relative Standard Deviation :Corr Correlation Coefficient.

ITEM	YES	NO	N/A	COMMENTS
Initial calibration documentation included in lab package?	X			
1) Blank plus 4 standards (7196A) or blank plus 3 standards (7199)	X			
2) Correlation coefficient of =0.995 (7196A) or =0.999 (7199)	X			
3) Calibrate daily or each time instrument is set up.	X			
Calibration Check Standard (CCS) for 7196A and Quality Control Sample (QCS) for 7199 Included in Lab Package?	X			
1) %R criteria met? (90 - 110%)	X			
2) Correct frequency of one per every 10 samples	X			
3) CCS and QCS from independent source and at mid-level of calibration curve	X			
Calibration Blanks	X			
1) Analyzed prior to initial calibration standards and after each CCS/QCS?	X			
2) Absolute value should not exceed MDL.		X		see nonconformance table below
Method Blank, Field Blanks and/or Equipment Blanks Included in Lab Package?	X			FS-FB20140409
1) Method blank analyzed with each preparation batch?	X			
2) Absolute value should not exceed MDL.		X		see nonconformance table below
Eh and pH Data	X			
1) Eh and pH data was included and plotted for all samples?	X			
Soluble Matrix Spike Data Included in Lab Package?	X			Concrete: FSI2-CM and AQ: FSI2GW
1) Soluble Matrix %R criteria met? (75-125%R).	X			
2) Was the spike concentration 40 mg/Kg or twice the sample concentration?	X			
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	X			
Insoluble Matrix Spike Data Included in Lab Package?	X			
1) Insoluble Matrix %R criteria met? (75-125%R).	X			
2) Was the spike concentration around 400 to 800 mg/Kg?	X			
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	X			

ITEM	YES	NO	N/A	COMMENTS
Post Digestion Spike	X			PDS was not performed for the AQ samples.
1) Post Digestion Spike %R criteria met? (85-115%R).	X			
2) Was the spike concentration 40 mg/Kg or twice the sample concentration?	X			
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	X			
Sample Duplicate Data Included in Lab Package?	X			Concrete: FSI2-CM and AQ: FSI2GW
1) RPD criteria met? (RPD ≤20%) if both results are ≤4x RL or absolute difference ≤RL if either or both results are <4xRL.		X		
2) Was a sample duplicate analyzed at the frequency of 1 per batch or 20 samples?	X			
Was a Laboratory Control Sample (LCS) Included in Lab Package?	X			
1) %R criteria met? (80-120%R).	X			
2) Was an LCS analyzed at the frequency of 1/batch or 20 samples?	X			
Were any Field Duplicate samples submitted with this SDG?		X		
1) Were Field duplicate RPD criteria met? (RPD≤20% for both sample results >4xRL or absolute difference ≤ RL if either or both results are <4xRL.			X	
Were all sample quantitation and reporting requirements met?	X			
1) Were all solid samples reported with percent solids > 50% ?	X			
2) Were any samples analyzed or reported with dilutions?	X			
Miscellaneous Items	X			
1) For soils by 7196A, was the pH within a range of 7.0-8.0?	X			
2) For soils by 7199, was the pH within a range of 9.0-9.5?			X	
3) For aqueous by 7196A, was the pH with a range of 1.5-2.5?	X			
4) For soils (3060A), was the digestion temperature 90-95C for at least 60 minutes?	X			
5) For 7199, was each sample injected twice and was the RPD =20?			X	

Laboratory Blanks

Blank ID	Analyte	Result	QL	Units	Associated Samples
GN2809-MB1	CHROMIUM (HEXAVALENT)	-0.004	0.01	mg/L	All aqueous samples

Matrix Spikes

Sample ID	Analyte	Analysis Batch	MS % Recovery	Lower Limit	Upper Limit
FSI2GW	CHROMIUM (HEXAVALENT)	GN2809	46.6	85	115

Lab Duplicates

Sample ID	Duplicate ID	Analyte	Sample Result	Qual	Duplicate Result	Qual	QL	Units	RPD
FSI2-CM	ACTDJB64216201404171122007	CHROMIUM (HEXAVALENT)	17.5		21.8		0.46	mg/kg	21.9

SDG#: JB64216
Batch: GN3053
 Cr+6 ICAL 04/14/14
 Soil
 (p. 59 of data pkg)

x - concentration	y - response
0	0
0.01	0.009
0.05	0.046
0.1	0.091
0.3	0.268
0.5	0.446
0.8	0.689
1	0.887

(p. 59 of data pkg)

AECOM Calculated Intercept	0.00186	OK Rounding	Reported intercept	0.00190
AECOM Slope	0.8772	OK	Reported Slope	0.8772
AECOM Calculated r	0.99980	OK	Reported r	0.99980

GP79324-B1
p.59

LCS calculation

Background Absorbance	0
Total absorbance	0.843
Total absorbance - background	0.843
Instrument Concentration	0.959
Sample weight (mg/kg)	0.0025
Final Volume (L)	0.1
Dilution Factor	1

AECOM Calculated LCS Result (mg/Kg)	38.4	OK	Reported Result (mg/Kg)	38.4
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%R = Found/True*100

p. 33

True Value (mg/kg)	40
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AECOM Calculated %R	95.9	OK rounding	Reported %R	96.0
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MS calculation

JB64216-10 [FSI2-CM]p. 59

Background reading	0
Total absorbance	0.321
Total absorbance - background	0.321
Instrument Concentration	0.3638
Sample weight (mg/kg)	0.00252
Final Volume (L)	0.1
Percent solids	0.867
Dilution Factor	50

AECOM Calculated MS Result (mg/Kg)	833	OK	Reported Result (mg/Kg)	833
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%R = Found/True*100

JB64216-10 [FSI2-CM]p. 37

True Value (mg/kg)	950
Native concentration (mg/Kg)	17.5

AECOM%R	85.8	OK	Reported %R	85.8
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Percent Solids

JB64216-10 [FSI2-CM]p. 39

Empty dish weight=	26.52
Wet weight=	34.88
Dry weight=	33.77

AECOM%solids =	86.7	OK	reported %solids=	86.7
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Reporting Limit**JB64216-10 [FSI2-CM]p. 18**

Low Standard	0.01		
Initial weight (mg/kg)	0.00247		
Final volume (L)	0.1		
Percent solids	0.867		
Dilution Factor	1		
Reporting Limit	0.47	OK rounding	Reported RL (mg/Kg)= 0.46

Sample Calculations**JB64216-10 [FSI2-CM]p. 18, 59**

Background reading	0		
Total absorbance	0.33		
Total absorbance - background	0.33		
Instrument Response	0.374		
Sample weight (mg/kg)	0.00247		
Final Volume (L)	0.1		
Percent solids	0.867		
Dilution Factor	1		
AECOM Calculated Result (mg/Kg)	17.5	OK	Reported Result (mg/Kg) 17.5

Client Name: PPG Industries	Project Number: 60154801.6001A
Site Location: PPG Garfield Avenue Supplemental Remedial Investigation (GARIS) Forrest Street Groundwater and Concrete, Jersey City, NJ	Project Manager: William Spronz
Laboratory: Accutest, Dayton, NJ	Type of Validation: Full
Laboratory Job No: JB64216A	Date Checked: 5/19/14
Validator: Paula DiMattei	Peer: Lisa Krowitz

ITEM	YES	NO	N/A	COMMENTS
Sample results included?	X			
Reporting Limits met project requirements?	X			
Field I.D. included?	X			
Laboratory I.D. included?	X			
Sample matrix included?	X			
Sample receipt temperature 2-6C?	X			
Signed COCs included?	X			
Date of sample collection included?	X			
Date of sample digestion included?	X			
Date of analysis included?	X			
Holding time met QC criteria? (Metals -180 days from sample collection; Mercury - 28 days from sample collection. If HT exceeded by 10 days R all results.	X			
Method reference included?	X			
Laboratory Case Narrative included?	X			

Definitions: MDL Method Detection Limit; %R Percent Recovery; RL Reporting Limit; RPD Relative Percent Difference; RSD Relative Standard Deviation ;Corr Correlation Coefficient.

ITEM	YES	NO	N/A	COMMENTS
Sample dilutions?		X		
Initial calibration documentation included in lab package?			X	NA for a Limited review
1) Calibrate daily or each time instrument is set up.			X	
2) ICP (6010) -Blank plus 1 standard? If no, reject (R) data.			X	
3) Hg (7470/7471) -Blank plus 5 standards? If no, reject (R) data.			X	
Initial Calibration Verification Standard (ICV) for ICP (6010) and Initial Calibration Check Standard (ICCS) for Hg (7470/7471) included in lab package?			X	
1) Analyzed immediately after initial calibration? If no, reject (R) data.			X	
2) %R criteria met? (90-110%). If no, J positive results for affected analyte(s) if %R between 80-89% and 111-120% and indicate bias; UJ non-detect results for affected analyte(s) if %R between 80-89% , and R all data for affected analyte(s) if %R 120%.			X	
3) Spot check ICV/ICCS results for several analytes.			X	
Continuing Calibration Verification Standard (CCV) for ICP (6010) and Calibration Check Standard (CCS) for Hg (7470/7471) included in Lab Package?			X	
1) Analyzed immediately after each ICV/ICC/CB and after every 10 samples? If no, reject (R) data.			X	
2) CCS and CCV from independent source and at mid-level of calibration curve. If no, reject (R) data.			X	
3) %R criteria met? (90-110%R). If no, J positive results for affected analyte(s) if %R between 80-89% and 111-120% and indicate bias; UJ non-detect results for affected analyte(s) if %R between 80-89% and R all data for affected analyte(s) if %R 120%.			X	
4) Spot check CCV/CCS results for several analytes.			X	
Low Calibration Standard (CRI) included in Lab Package?			X	
1) %R criteria met? - 50-150% for Co, Mn, Zn, by ICP-MS; Pb, Tl by 6010; 70-130% all others. If no, refer to ILM05.4 NJ SOP 5.A.2 for actions.			X	

ITEM	YES	NO	N/A	COMMENTS
Calibration Blanks			X	
1) Analyzed after daily calibration and after each ICV/ICC/CCV/CCS and after every 10 samples? If no, reject (R) data.			X	
2) Absolute value 10xCB result, no qualification.			X	
Method Blank Included in Lab Package?	X			
1) Method blank analyzed with each preparation batch or every SDG, or 1/20 samples? If no, reject (R) data, except no aqueous MB required for FB/EB if only soil samples were analyzed.	X			
2) Method blank analyzed 1/20 samples? If - MB 1/25, J sample results from 21-25; -MB >1/25, R sample results after 25th sample.	X			
3) MB results nondetect? If no, -sample result 3xMB but 10xMB, no qualification.		X		see nonconformance table below
4) Negative MB result reported? If yes, -Positive sample result		X		
Field Blanks/Equipment Blanks Included in Lab Package?	X			FS-FB20140409
1) FB/EB result non-detect? If no, -sample result 3xFB/EB but 10xFB/EB, no qualification.	X			
ICP Interference Check Sample (ICS) included in Lab Package?			X	NA for a Limited review
1) Analyzed at beginning of analytical run? If no, reject (R) data.			X	
2) %R criteria met? (80-120%) If no, %R>120%, no qualification if sample result non-detect; %R between 121-150%, J positive results, biased high; %R between 50-79%, J/UJ results, biased low; %R150%, reject (R) result			X	
3) Spot check accuracy of %Rs			X	
Matrix Spike/Matrix Spike Duplicate Data Included in Lab Package?			X	Only batch QC was provided for the concrete and groundwater samples. Batch QC was not assessed.
1) MS/MSD %R (75-125%R) and RPD (+20%) criteria met? - %R>125% J positive results for affected analyte(s) for all samples in the same batch/SDG, accept NDs; -%R			X	
2) Was a sample spiked at the frequency of 1/batch or 20 samples?			X	
3) Was the MS performed on a site sample?			X	
4) Was the MS performed on a FB/EB or TB? If yes, J all sample data.			X	

ITEM	YES	NO	N/A	COMMENTS
Post Digestion Spike			X	NA for a Limited review
1) %R criteria met? (75-125%R) - %R>125% J positive results for affected analyte(s) for all samples in the same batch/SDG, accept NDs.; - %R			X	
2) Was the spike performed on a FB/EB or TB? If yes, J all sample data.			X	
3) Was a sample spiked at the frequency of 1/batch or 20 samples?			X	
Laboratory Duplicate Data Included in Lab Package?		X		MS/MSD analyses were performed in lieu of a laboratory duplicate analysis.
Aqueous - If RPD is >20% but 5x the QL, estimate (J) results >the QL. - If RPD is >100%, reject R results >= the QL.- If sample and/or duplicate is the QL, estimate (J) positive results 2x the QL, reject R non-detects and positive results			X	
Soil - If RPD is >35% but 5x the QL, estimate (J) results > the QL. - If RPD is >120%, reject results > the QL. - If sample and/or duplicate is 2x the QL, estimate (J) positive results 4x the QL, reject nondetects and positive results			X	
Was a Laboratory Control Sample (LCS) Included in Lab Package?	X			
1) LCS %R criteria met? (80-120%R). If no, J/UJ all affected analytes(s) for all samples in the same batch/SDG.	X			
2) Was an LCS analyzed at the frequency of 1/batch or 20 samples? If no, J/UJ affected analyte(s) for all samples in the same batch/SDG.	X			
Serial Dilution			X	NA for a Limited review
1) %D(25xIDL (7000) or >10xIDL (6010) and %D >10% J positive results for affected analyte(s) for all samples in the same batch/SDG, accept NDs.			X	
2) Was the frequency 1/batch or 20 samples?			X	
3) Was a site sample used?			X	
4) Was a FB/EB or TB used? If yes, J all sample data.			X	
5) Spot check accuracy of %Ds.			X	

ITEM	YES	NO	N/A	COMMENTS
Field Duplicate Data included in Lab Package?		X		
Aqueous - If RPD is >20% but 5x the QL, estimate (J) results > the QL. - If RPD is >100%, reject R results >= the QL. - If sample and/or duplicate is the QL, estimate (J) positive results 2x the QL, reject R non-detects and positive results			X	
Soil - If RPD is >35% but 5x the QL, estimate (J) results > the QL. - If RPD is >120%, reject results > the QL. - If sample and/or duplicate is 2x the QL, estimate (J) positive results 4x the QL, reject nondetects and positive results			X	
Percent Solids data included in Lab Package?	X			
1) %Solids criteria (Reg 2 criteria) met? (>=50%)	X			

Laboratory Blanks

Blank ID	Analyte	Result	QL	Units	Associated Samples
MP78860-MB1	Chromium	0.095	0.95	mg/kg	All concrete samples

Data Validation Report

Project:	PPG Garfield Avenue Supplemental Remedial Investigation (GARIS) Forrest Street Soil	
Laboratory:	Accutest, Dayton, NJ	
Laboratory Job No.:	JB64326, JB64326A and JB64326R	
Analysis/Method:	Hexavalent Chromium SW846 3060A/7196 Metals by ICP-AES/ SW846-6010	
Validation Level:	Full (Hexavalent chromium) Limited (Metals)	
Site Location/Address:	Forrest Street, Jersey City, NJ	
AECOM Project No:	60154801.6001A	
Prepared by:	Paula DiMattei /AECOM	Completed on: 05/19/2014
Reviewed by:	Lisa Krowitz /AECOM	File Name: JB64326_A_R_2014-05-19_DV Report-F

Introduction

The data were reviewed in accordance with the FSP-QAPP and the following NJDEP validation Standard Operating Procedures (SOP):

- NJDEP Office of Data Quality SOP 5.A.10, Rev 3 (September 2009), SOP for Analytical Data Validation of Hexavalent Chromium - for USEPA SW-846 Method 3060A, USEPA SW-846 Method 7196A and USEPA SW-846 Method 7199;
- NJDEP Office of Data Quality SOP 5.A.16, Rev 1 (May 2002), Quality Assurance Data Validation of Analytical Deliverables for Inorganics (based on USEPA SW-846 Methods)

The results of quality control data analyzed with site samples were used to assess the overall reliability of the data. The following qualifiers were used to identify data quality issues:

- U: Indicates the analyte was not detected in the sample above the sample reporting limit.
- J: Indicates the result was an estimated value; the associated numerical value was an approximate concentration of the analyte in the sample.
- UJ: Indicates the analyte was not detected above the reporting limit and the reporting limit was approximate.
- R: The sample result was rejected due to serious deficiencies; the presence or absence of the analyte could not be confirmed.
- RA: The sample result was rejected but is still considered usable.

Sample Information

The samples listed below were collected by AECOM on April 10, 2014 and March 17, 2014 as part of the PPG Garfield Avenue Supplemental Remedial Investigation (GARIS) Forrest Street Soil sampling at the PPG Forrest Street, Jersey City, NJ. Only the samples and parameters listed below were validated.

Field ID	Laboratory ID	Matrix	Fraction
FS18-2.0-2.5	JB64326-5	Soil	Hexavalent Chromium
FS18-2.0-2.5	JB64326-5A	Soil	Metals
FS18-2.0-2.5	JB64326-5R	Soil	Hexavalent Chromium
FS-FB20140410 (Equipment Blank)	JB64326-9	Aqueous	Hexavalent Chromium
FS-FB20140410 (Equipment Blank)	JB64326-9A	Aqueous	Metals
FSI8-0.5-1.0	JB64326-1	Soil	Hexavalent Chromium
FSI8-0.5-1.0	JB64326-1A	Soil	Metals
FSI8-0.5-1.0	JB64326-1R	Soil	Hexavalent Chromium
FSI8-1.0-1.5	JB64326-2	Soil	Hexavalent Chromium
FSI8-1.0-1.5	JB64326-2A	Soil	Metals
FSI8-1.0-1.5	JB64326-2R	Soil	Hexavalent Chromium
FSI8-1.0-1.5X (Field Duplicate of FSI8-1.0-1.5)	JB64326-3	Soil	Hexavalent Chromium
FSI8-1.0-1.5X (Field Duplicate of FSI8-1.0-1.5)	JB64326-3A	Soil	Metals
FSI8-1.0-1.5X (Field Duplicate of FSI8-1.0-1.5)	JB64326-3R	Soil	Hexavalent Chromium
FSI8-1.5-2.0	JB64326-4	Soil	Hexavalent Chromium
FSI8-1.5-2.0	JB64326-4A	Soil	Metals
FSI8-1.5-2.0	JB64326-4R	Soil	Hexavalent Chromium
FSI8-2.5-3.0	JB64326-6	Soil	Hexavalent Chromium
FSI8-2.5-3.0	JB64326-6A	Soil	Metals
FSI8-2.5-3.0	JB64326-6R	Soil	Hexavalent Chromium
FSI8-3.0-3.5	JB64326-7	Soil	Hexavalent Chromium
FSI8-3.0-3.5	JB64326-7A	Soil	Metals
FSI8-3.0-3.5	JB64326-7R	Soil	Hexavalent Chromium
FSI8-3.5-4.0	JB64326-8	Soil	Hexavalent Chromium
FSI8-3.5-4.0	JB64326-8A	Soil	Metals
FSI8-3.5-4.0	JB64326-8R	Soil	Hexavalent Chromium

The samples were collected following the procedures detailed in the Remedial Investigation Work Plan - Soil for Non-Residential Chromate Chemical Production Waste Sites 114, 132, 133, 135, 137, 143, and 186, Jersey City, New Jersey, or applicable proposal or work plan, and the Field Sampling Plan/Quality Assurance Project Plan for Non-Residential and Residential Chromium Sites Hudson County, New Jersey (December 2011).

General Comments

The data package was complete. Quality control (QC) issues identified during validation are discussed below. Refer to the Target Analyte Summary Hit(s) in Attachment A for a listing of all detected results, qualified results, and associated qualifications, where applicable. The nonconformances for each section discussed below are presented in Attachment B.

Hexavalent Chromium

Laboratory Blanks/Equipment Blanks

Method Blank

Negative drift for hexavalent chromium was detected in the continuing calibration blanks (CCBs) and the method blank, at comparable amounts, impacting the equipment blank in this SDG. The nondetect hexavalent chromium result for the equipment blank FS-FB20140410 was qualified as estimated (UJ).

MS Results

Sample FS18-3.5-4.0 [JB64326-8] was selected for the soil matrix spike analysis and used for supporting data quality recommendations. The soluble and insoluble matrix spike (MS) recoveries from the initial batch were 27.3% and 71.4%, respectively. The soluble and insoluble MS recoveries did not meet the quality control (QC) criteria of 75-125%R. The post digestion spike (PDS) recovery was 68.4% and the pH-adjusted PDS recovery was 86%. Although the PDS recovery did not meet the PDS criteria of 85-115%, the pH-adjusted PDS did meet the PDS criteria.

Based on poor MS recoveries, less than 75%R, the MS and associated samples were reanalyzed using Method 7196. The soluble and insoluble matrix spike recoveries from the re-analysis were 52.3% and 83.3%, respectively. The soluble MS recovery did not meet the QC criteria of 75-125%R. The PDS result for the re-analysis batch was recovered at 77.8% and the pH-adjusted PDS recovered at 68.3%, which did not meet the PDS criteria of 85-115%.

Since the soluble and/or insoluble MS recoveries were outside the acceptable QC limit of 75-125%, additional parameters were analyzed to determine if possible matrix interferences could be the cause for the poor matrix spike recoveries. All the soil samples were tested for pH and oxidation reduction potential (ORP) and plotted on an Eh/pH phase diagram chart. From this chart, the source sample for the matrix spike analysis was plotted below the phase change line, indicating reducing potential within the sample matrix, incapable of supporting hexavalent chromium. Analyses for ferrous iron, sulfide screen, and total organic carbon (TOC) were performed on the MS source sample to confirm the oxidizing/reducing potential within the sample matrix. The sulfide screen was reported as nondetect, indicating no reducing agents within the sample matrix; however, the ferrous iron (1.2%) and the TOC results (18,600 mg/kg) were positive, indicating potential reducing agents within the sample matrix.

Since the MS recoveries from both the initial and reanalysis did not meet the MS QC requirements, but at least one MS recovery was greater than 50%, the highest detected hexavalent chromium result was reported for each soil sample. The reported hexavalent chromium results in all the soil samples in this SDG were qualified as estimated (J) due to the poor MS recoveries.

No further qualification was taken based on the low re-analysis PDS recovery since the pH-adjusted PDS %R in the initial analysis was acceptable.

Laboratory Duplicate Precision

Sample FS18-3.5-4.0 [JB64326-8R] was selected by the laboratory to demonstrate laboratory precision capabilities.

The relative percent difference (RPD) for hexavalent chromium exceeded the QC acceptance RPD in the reanalysis; therefore, the hexavalent chromium results in the soil samples reported from the reanalysis were qualified as estimated (J).

Field Duplicate Results

The field duplicate samples in this SDG were FS18-1.0-1.5 and FS18-1.0-1.5X.

The RPD for the reported hexavalent chromium field duplicate results exceeded the QC acceptance RPD; therefore, the reported hexavalent chromium results in all the soil samples in this SDG were qualified as estimated (J/UJ).

Metals

Laboratory Blanks/Equipment Blanks

Method Blank

Chromium and nickel were detected in the method blank (MP78886-MB1) associated with the soil samples in this SDG, at concentrations above the MDLs, but below the RLs. Since the results for chromium and nickel in the associated soil samples were greater than ten times the amount detected in the method blank, no qualifications were required.

MS Results

MS/MSD analysis was performed on sample FS18-3.5-4.0 [JB64326-8A] associated with the Method 6010 analysis of the soil samples in this SDG.

The recoveries of antimony and chromium did not meet the QC criteria of 75-125%, and the RPD for chromium did not meet the QC criteria. The positive and nondetect results for antimony in all soil samples were qualified as estimated (J/UJ) with a potential low bias. The positive results for chromium in all soil samples were qualified as estimated (J) with potential bias in an unknown direction due to the high MS/MSD recoveries and exceeded relative percent difference (RPD).

Sample Results

Reported results (flagged B by the laboratory) that were less than the reporting limit (RL), but greater than or equal to the method detection limit (MDL) are approximate values that have been qualified as estimated (J).

Data Quality and Usability

In general, these data appear to be valid and may be used for decision-making purposes. No data were rejected. Qualified results, if applicable, are presented in Attachments A and B.

The hexavalent chromium result in the equipment blank is usable as estimated value with a potential low bias due to negative instrument drift.

The hexavalent chromium soil results in this SDG are usable as estimated values with the potential for low bias due to low soluble MS recovery, and since the MS sample matrix appears to be reducing

In addition, the hexavalent chromium results are usable as estimated values with an unknown bias due to poor laboratory duplicate and or field duplicate precision.

Sample results for antimony qualified due to low MS recoveries are usable as estimated values with the potential for low bias.

Sample results for chromium qualified due to high MS recoveries and an exceeded MS/MSD RPD are usable as estimated values with an unknown directional bias.

Sample results reported between the MDL and RL are usable as estimated values with an unknown directional bias.

ATTACHMENTS

Attachment A: Target Analyte Summary Hitlist(s)

Attachment B: Data Validation Report Form

Attachment A

Target Analyte Summary Hitlist(s)

Soil Target Analyte Summary Hit List (Hexavalent Chromium)

Site Name PPG Garfield Avenue Supplemental Remedial Investigation (GARIS) Forrest Street
Sampling Date April 10, 2014 and March 17, 2014
Lab Name/ID Accutest, Dayton, NJ
SDG No JB64326 and JB64326R
Sample Matrix Soil
Trip Blank ID NA
Field Blank ID FS-FB20140410

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
FSI8-1.0-1.5X	JB64326-3	CHROMIUM (HEXAVALENT)	U	1.4	1.4	0.48	Qualify	18,29
FSI8-2.5-3.0	JB64326-6	CHROMIUM (HEXAVALENT)	U	2.4	2.4	0.55	Qualify	18,29
FSI8-2.0-2.5	JB64326-5R	CHROMIUM (HEXAVALENT)	U	1.7	1.7	0.49	Qualify	8,18,29
FSI8-0.5-1.0	JB64326-1R	CHROMIUM (HEXAVALENT)	U	1.1	1.1	0.53	Qualify	8,18,29
FSI8-1.0-1.5	JB64326-2R	CHROMIUM (HEXAVALENT)	U	3.6	3.6	0.48	Qualify	8,18,29
FSI8-1.5-2.0	JB64326-4R	CHROMIUM (HEXAVALENT)	U	1.3	1.3	0.47	Qualify	8,18,29
FSI8-3.0-3.5	JB64326-7R	CHROMIUM (HEXAVALENT)	U	1.6	1.6	0.51	Qualify	8,18,29
FSI8-3.5-4.0	JB64326-8R	CHROMIUM (HEXAVALENT)	U	5.6	5.6	0.53	Qualify	8,18,29

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

NJDEP Laboratory Footnote

1. The value reported is less than or equal to 3x the value in the preparation/reagent blank. It is the policy of NJDEP-DPFSR to negate the reported value due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.

2. The value reported is greater than three (3) times but less than ten (10) times the value in the preparation/reagent blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to the preparation/reagent blank contamination. The "B" qualifier alerts the end-user to the presence of this analyte in the preparation/reagent blank.

3. The value reported is less than or equal to three (3) times the value in the trip/field blank. It is the policy of NJDEP-DPFSSR to negate the reported value as due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
4. The value reported is greater than three (3) times but less than ten (10) times the value in the trip/field blanks and is considered "real". However, the reported value must be quantitatively qualified "J" due to trip/field blank contamination.
5. The concentration reported by the laboratory is incorrectly calculated.
6. The laboratory failed to report the presence of the analyte in the sample.
7. The reported Hexavalent Chromium value was qualified because the Calibration Check Standard was not within the recovery range (90-110 percent).
8. In the Duplicate Sample Analysis, Hexavalent Chromium fell outside the control limits of ≤ 20 percent for sample results $> 4xRL$ or $+ RL$ for sample results $< 4xRL$. Therefore, the result was qualified.
9. This analyte was rejected because the laboratory performed the Duplicate Analysis on a field blank.
10. The reported value was qualified because the PVS recovery was greater than 115 percent.
11. The reported value was qualified because the PVS recovery was less than 85 percent.
12. The non-detected value was qualified (UJ) because the PVS recovery was less than 85 percent. The possibility of a false negative exists.
13. The reported analyte was qualified because the associated Calibration Blank result was greater than the MDL.
14. The laboratory made a transcription error. No hits were found in the raw data.
15. This analyte is qualified or rejected because the laboratory exceeded the holding time for digestion and/or analysis.
16. The laboratory subtracted the preparation/reagent blank from the sample result. The Reviewer's calculation puts the preparation/reagent blank back into the result.
17. The photocopy is unreadable. Therefore, the QA reviewer cannot read the laboratory's reported concentration result.

18. The reported value was qualified because the predigestion spike recovery was less than 75 %, but greater than 50%.
19. The reported value was qualified because the predigestion spike recovery was greater than 125 percent.
20. The non-detected value was qualified (UJ) because the redigestion spike recovery was less than 75 percent. The possibility of a false negative exists.
21. The reported result was qualified or rejected because the laboratory did not record the pH value(s) of the sample in a laboratory notebook.
22. The reported value was qualified (J/UJ) because the sample moisture content exceeded 50 percent.
23. The sample result was rejected because the soluble and insoluble matrix spike recoveries were less than 50%.
24. The detected sample result was qualified (J) because the incorrect spike concentration was used.
25. The reported sample results were rejected because the predigestion spike recovery was greater than 150 percent.
26. The reported sample results were rejected because the redigestion spike recovery was greater than 150 percent.
27. The reported value was qualified (J) because the redigestion spike recovery was less than 75 percent.
28. The reported value was qualified (J/UJ) because the sample digestion temperature was less than 90C.
29. In the Field Duplicate Sample Analysis, Hexavalent Chromium fell outside the control limits of $\leq 20\%$ for sample results $> 4xRL$ or $+ RL$ for sample results $< 4xRL$. Therefore, the result was qualified.
30. The reported value was qualified as estimated (J/UJ) but the bias is uncertain due to both high and low MS recoveries.
31. The reported result was greater than the MDL but less than the RL and qualified (J) as estimated by the laboratory.
32. The reported value was qualified because the sample replicate precision criterion of $\leq 20\%$ for method 7199 was exceeded.
33. The reported value was qualified (J/UJ) because the laboratory control sample (LCS) recovery was less than 80%.

34. The reported value was qualified (J) because the laboratory control sample (LCS) recovery was greater than 120%.
35. The reported result was qualified because the matrix spike analysis was not performed at the proper frequency.
36. The reported result was qualified because the laboratory duplicate analysis was not performed at the proper frequency.
37. The result was qualified because the cooler temperature upon sample receipt exceeded 6C.
38. The reported value was qualified because the redigestion spike recovery was greater than 125 percent.
39. The reported result was rejected because the laboratory failed to perform the reanalysis due to insufficient sample volume.
40. The reported results was qualified because the laboratory failed to analyze an ending CCB.
41. The reported result was qualified because the laboratory failed to make the proper method specific pH adjustment.
42. The reported result was rejected because the laboratory failed to reanalyze the MS and associated sample(s) due to failed MS recoveries.
43. The result was qualified due to negative instrument drift.

Aqueous Target Analyte Summary Hit List (Hexavalent Chromium)

Site Name PPG Garfield Avenue Supplemental Remedial Investigation (GARIS) Forrest Street
Sampling Date April 10, 2014 and March 17, 2014
Lab Name/ID Accutest, Dayton, NJ
SDG No JB64326
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID NA

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/L)	Laboratory Sample Result (mg/L)	Validation Sample Result (mg/L)	RL (mg/L)	Quality Assurance Decision	NJDEP Validation Footnote
FS-FB20140410	JB64326-9	CHROMIUM (HEXAVALENT)	-0.002	U	U	0.010	Qualify	43

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

NJDEP Laboratory Footnote

1. The value reported is less than or equal to 3x the value in the preparation/reagent blank. It is the policy of NJDEP-DPF SR to negate the reported value due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
2. The value reported is greater than three (3) times but less than ten (10) times the value in the preparation/reagent blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to the preparation/reagent blank contamination. The "B" qualifier alerts the end-user to the presence of this analyte in the preparation/reagent blank.
3. The value reported is less than or equal to three (3) times the value in the trip/field blank. It is the policy of NJDEP-DPF SR to negate the reported value as due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
4. The value reported is greater than three (3) times but less than ten (10) times the value in the trip/field blanks and is considered "real". However, the reported value must be quantitatively qualified "J" due to trip/field blank contamination.
5. The concentration reported by the laboratory is incorrectly calculated.

6. The laboratory failed to report the presence of the analyte in the sample.
7. The reported Hexavalent Chromium value was qualified because the Calibration Check Standard was not within the recovery range (90-110 percent).
8. In the Duplicate Sample Analysis, Hexavalent Chromium fell outside the control limits of ≤ 20 percent for sample results $> 4xRL$ or $+ RL$ for sample results $< 4xRL$. Therefore, the result was qualified.
9. This analyte was rejected because the laboratory performed the Duplicate Analysis on a field blank.
10. The reported value was qualified because the PVS recovery was greater than 115 percent.
11. The reported value was qualified because the PVS recovery was less than 85 percent.
12. The non-detected value was qualified (UJ) because the PVS recovery was less than 85 percent. The possibility of a false negative exists.
13. The reported analyte was qualified because the associated Calibration Blank result was greater than the MDL.
14. The laboratory made a transcription error. No hits were found in the raw data.
15. This analyte is qualified or rejected because the laboratory exceeded the holding time for digestion and/or analysis.
16. The laboratory subtracted the preparation/reagent blank from the sample result. The Reviewer's calculation puts the preparation/reagent blank back into the result.
17. The photocopy is unreadable. Therefore, the QA reviewer cannot read the laboratory's reported concentration result.
18. The reported value was qualified because the predigestion spike recovery was less than 75 %, but greater than 50%.
19. The reported value was qualified because the predigestion spike recovery was greater than 125 percent.
20. The non-detected value was qualified (UJ) because the redigestion spike recovery was less than 75 percent. The possibility of a false negative exists.
21. The reported result was qualified or rejected because the laboratory did not record the pH value(s) of the sample in a laboratory notebook.

22. The reported value was qualified (J/UJ) because the sample moisture content exceeded 50 percent.
23. The sample result was rejected because the soluble and insoluble matrix spike recoveries were less than 50%.
24. The detected sample result was qualified (J) because the incorrect spike concentration was used.
25. The reported sample results were rejected because the predigestion spike recovery was greater than 150 percent.
26. The reported sample results were rejected because the redigestion spike recovery was greater than 150 percent.
27. The reported value was qualified (J) because the redigestion spike recovery was less than 75 percent.
28. The reported value was qualified (J/UJ) because the sample digestion temperature was less than 90C.
29. In the Field Duplicate Sample Analysis, Hexavalent Chromium fell outside the control limits of $\leq 20\%$ for sample results $> 4xRL$ or $+ RL$ for sample results $< 4xRL$. Therefore, the result was qualified.
30. The reported value was qualified as estimated (J/UJ) but the bias is uncertain due to both high and low MS recoveries.
31. The reported result was greater than the MDL but less than the RL and qualified (J) as estimated by the laboratory.
32. The reported value was qualified because the sample replicate precision criterion of $\leq 20\%$ for method 7199 was exceeded.
33. The reported value was qualified (J/UJ) because the laboratory control sample (LCS) recovery was less than 80%.
34. The reported value was qualified (J) because the laboratory control sample (LCS) recovery was greater than 120%.
35. The reported result was qualified because the matrix spike analysis was not performed at the proper frequency.
36. The reported result was qualified because the laboratory duplicate analysis was not performed at the proper frequency.
37. The result was qualified because the cooler temperature upon sample receipt exceeded 6C.
38. The reported value was qualified because the redigestion spike recovery was greater than 125 percent.

39. The reported result was rejected because the laboratory failed to perform the reanalysis due to insufficient sample volume.
40. The reported results was qualified because the laboratory failed to analyze an ending CCB.
41. The reported result was qualified because the laboratory failed to make the proper method specific pH adjustment.
42. The reported result was rejected because the laboratory failed to reanalyze the MS and associated sample(s) due to failed MS recoveries.
43. The result was qualified due to negative instrument drift.

Soil Target Analyte Summary Hit List (Metals)

Site Name PPG Garfield Avenue Supplemental Remedial Investigation (GARIS) Forrest Street
Sampling Date April 10, 2014 and March 17, 2014
Lab Name/ID Accutest, Dayton, NJ
SDG No JB64326A
Sample Matrix Soil
Trip Blank ID NA
Field Blank ID FS-FB20140410

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
FSI8-2.0-2.5	JB64326-5A	ANTIMONY	U	U	U	2.4	Qualify	15
FSI8-2.0-2.5	JB64326-5A	CHROMIUM	0.11	17.0	17.0	1.2	Qualify	8,16
FSI8-2.0-2.5	JB64326-5A	NICKEL	0.48	13.8	13.8	4.7		
FSI8-2.0-2.5	JB64326-5A	THALLIUM	U	0.60B	0.60	1.2	Qualify	23
FSI8-2.0-2.5	JB64326-5A	VANADIUM	U	21.5	21.5	5.9		
FSI8-0.5-1.0	JB64326-1A	ANTIMONY	U	U	U	2.5	Qualify	15
FSI8-0.5-1.0	JB64326-1A	CHROMIUM	0.11	21.2	21.2	1.3	Qualify	8,16
FSI8-0.5-1.0	JB64326-1A	NICKEL	0.48	13.3	13.3	5.1		
FSI8-0.5-1.0	JB64326-1A	THALLIUM	U	0.97B	0.97	1.3	Qualify	23
FSI8-0.5-1.0	JB64326-1A	VANADIUM	U	16.4	16.4	6.4		
FSI8-1.0-1.5	JB64326-2A	ANTIMONY	U	U	U	2.5	Qualify	15
FSI8-1.0-1.5	JB64326-2A	CHROMIUM	0.11	18.7	18.7	1.2	Qualify	8,16
FSI8-1.0-1.5	JB64326-2A	NICKEL	0.48	15.1	15.1	4.9		
FSI8-1.0-1.5	JB64326-2A	THALLIUM	U	0.78B	0.78	1.2	Qualify	23
FSI8-1.0-1.5	JB64326-2A	VANADIUM	U	19.9	19.9	6.1		
FSI8-1.0-1.5X	JB64326-3A	ANTIMONY	U	U	U	2.5	Qualify	15
FSI8-1.0-1.5X	JB64326-3A	CHROMIUM	0.11	20.3	20.3	1.2	Qualify	8,16
FSI8-1.0-1.5X	JB64326-3A	NICKEL	0.48	15.1	15.1	5.0		

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
FSI8-1.0-1.5X	JB64326-3A	THALLIUM	U	0.99B	0.99	1.2	Qualify	23
FSI8-1.0-1.5X	JB64326-3A	VANADIUM	U	20.2	20.2	6.2		
FSI8-1.5-2.0	JB64326-4A	ANTIMONY	U	U	U	2.4	Qualify	15
FSI8-1.5-2.0	JB64326-4A	CHROMIUM	0.11	21.7	21.7	1.2	Qualify	8,16
FSI8-1.5-2.0	JB64326-4A	NICKEL	0.48	16.6	16.6	4.7		
FSI8-1.5-2.0	JB64326-4A	THALLIUM	U	0.51B	0.51	1.2	Qualify	23
FSI8-1.5-2.0	JB64326-4A	VANADIUM	U	25.3	25.3	5.9		
FSI8-2.5-3.0	JB64326-6A	ANTIMONY	U	U	U	2.7	Qualify	15
FSI8-2.5-3.0	JB64326-6A	CHROMIUM	0.11	30.9	30.9	1.4	Qualify	8,16
FSI8-2.5-3.0	JB64326-6A	NICKEL	0.48	17.4	17.4	5.4		
FSI8-2.5-3.0	JB64326-6A	VANADIUM	U	20.0	20.0	6.8		
FSI8-3.0-3.5	JB64326-7A	ANTIMONY	U	U	U	2.6	Qualify	15
FSI8-3.0-3.5	JB64326-7A	CHROMIUM	0.11	16.7	16.7	1.3	Qualify	8,16
FSI8-3.0-3.5	JB64326-7A	NICKEL	0.48	15.8	15.8	5.2		
FSI8-3.0-3.5	JB64326-7A	THALLIUM	U	0.62B	0.62	1.3	Qualify	23
FSI8-3.0-3.5	JB64326-7A	VANADIUM	U	20.0	20.0	6.5		
FSI8-3.5-4.0	JB64326-8A	ANTIMONY	U	0.34B	0.34	2.6	Qualify	15,23
FSI8-3.5-4.0	JB64326-8A	CHROMIUM	0.11	20.4	20.4	1.3	Qualify	8,16
FSI8-3.5-4.0	JB64326-8A	NICKEL	0.48	15.2	15.2	5.1		
FSI8-3.5-4.0	JB64326-8A	VANADIUM	U	19.7	19.7	6.4		

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

NJDEP Laboratory Footnote

1. The value reported is less than or equal to 3x the value in the method blank. It is the policy of NJDEP-DPFSR to negate the reported value due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
2. The value reported is greater than three (3) but less than ten (10) times the value in the method blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to the method blank contamination. The "B" qualifier alerts the end-user to the presence of this analyte in the method blank.
3. The value reported is less than or equal to 3x the value in the trip/field blank. It is the policy of NJDEP-DPFSR to negate the reported value as due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
4. The value reported is greater than 3x but less than ten (10) the value in the trip/field blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to trip/field blank contamination.
5. The concentration reported by the laboratory is incorrectly calculated.
6. The laboratory failed to report the presence of the analyte in the sample.
7. The reported metal value was qualified because the Calibration Verification Standard was not within the recovery range (90-110 percent).
8. In the MS/MSD Sample Analysis, this analyte fell outside the control limits of 20% RPD. Therefore, the result was qualified.
9. This analyte was qualified because the laboratory performed the MS/MSD Analysis on a field blank.
10. The reported analyte was qualified because the associated Calibration Blank result was greater than the MDL.
11. The reported value was qualified because serial dilution analysis was not within QC limit of 10% D.
12. This analyte is rejected because the laboratory exceeded the holding time for digestion and analysis.
13. The laboratory subtracted the method blank from the sample result. The reviewer's calculation has added the method blank result to the reported concentration.

14. The photocopy submitted is illegible. Therefore, the QA reviewer cannot read the laboratory's reported concentration result.
15. The reported or nondetected value was qualified because the MS/MSD spike recovery was less than 75 percent.
16. The reported value was qualified because the MS/MSD spike recovery was greater than 125 percent.
17. The reported value was qualified as estimated (J/UJ) but the bias is uncertain due to both high and low MS recoveries.
18. The reported values were qualified because the laboratory duplicate exceeded 35 percent RPD for results greater than 5X the reporting limit or the absolute difference exceeded two times the reporting limit for sample result less than 5 times the reporting limit.
19. The reported value was qualified because the field duplicate exceeded 35 percent RPD for results greater than 5X the reporting limit or the absolute difference exceeded two times the reporting limit for sample result less than 5 times the reporting limit.
20. The reported value was qualified because the LCS recovery was less than 80 percent.
21. The reported value was qualified because the sample moisture content was greater than 50 percent.
22. The reported value was rejected because the field duplicate absolute difference was greater than 4 times the RL or the RPD was greater than 120%.
23. The reported result was greater than the MDL but less than the RL and qualified (J) as estimated by the laboratory.
24. The field duplicate absolute difference exceeded two times the reporting limit for sample result less than 5 times the reporting limit.
25. The reported value was qualified because the LCS recovery was greater than 120 percent.

Attachment B

Data Validation Report Form

Client Name: PPG Industries	Project Number: 60154801.6001A
Site Location: PPG Garfield Avenue Supplemental Remedial Investigation (GARIS) Forrest Street Soil, Jersey City, NJ	Project Manager: William Spronz
Laboratory: Accutest, Dayton, NJ	Type of Validation: Full
Laboratory Job No: JB64326 and JB64326R	Date Checked: 5/19/14
Validator: Paula DiMattei	Peer: Lisa Krowitz

ITEM	YES	NO	N/A	COMMENTS
Sample results included?	X			
Reporting Limits met project requirements?	X			
Field I.D. included?	X			
Laboratory I.D. included?	X			
Sample matrix included?	X			
Sample receipt temperature 2-6C?	X			
Signed COCs included?	X			
Date of sample collection included?	X			
Date of sample digestion included?	X			
Holding time to digestion met criteria? (Soils -30 days from collection to digestion.)	X			
Date of analysis included?	X			
Holding time to analysis met criteria? (Soils -168 hours from digestion to analysis; Aqueous - 24 hours from collection to analysis.)	X			
Method reference included?	X			
Laboratory Case Narrative included?	X			

Definitions: MDL Method Detection Limit; %R Percent Recovery; RL Reporting Limit; RPD Relative Percent Difference; RSD Relative Standard Deviation :Corr Correlation Coefficient.

ITEM	YES	NO	N/A	COMMENTS
Initial calibration documentation included in lab package?	X			
1) Blank plus 4 standards (7196A) or blank plus 3 standards (7199)	X			
2) Correlation coefficient of =0.995 (7196A) or =0.999 (7199)	X			
3) Calibrate daily or each time instrument is set up.	X			
Calibration Check Standard (CCS) for 7196A and Quality Control Sample (QCS) for 7199 Included in Lab Package?	X			
1) %R criteria met? (90 - 110%)	X			
2) Correct frequency of one per every 10 samples	X			
3) CCS and QCS from independent source and at mid-level of calibration curve	X			
Calibration Blanks	X			
1) Analyzed prior to initial calibration standards and after each CCS/QCS?	X			
2) Absolute value should not exceed MDL.		X		see nonconformance table below
Method Blank, Field Blanks and/or Equipment Blanks Included in Lab Package?	X			FS-FB20140410
1) Method blank analyzed with each preparation batch?	X			
2) Absolute value should not exceed MDL.		X		see nonconformance table below
Eh and pH Data	X			
1) Eh and pH data was included and plotted for all samples?	X			
Soluble Matrix Spike Data Included in Lab Package?	X			Soil: FS18-3.5-4.0
1) Soluble Matrix %R criteria met? (75-125%R).		X		see nonconformance table below
2) Was the spike concentration 40 mg/Kg or twice the sample concentration?	X			
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	X			
Insoluble Matrix Spike Data Included in Lab Package?	X			
1) Insoluble Matrix %R criteria met? (75-125%R).		X		See nonconformance table below.
2) Was the spike concentration around 400 to 800 mg/Kg?		X		Spiked at 1230 mg/kg and 932 mg/kg. No impact to data.
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	X			

ITEM	YES	NO	N/A	COMMENTS
Post Digestion Spike	X			
1) Post Digestion Spike %R criteria met? (85-115%R).		X		See nonconformance table below.
2) Was the spike concentration 40 mg/Kg or twice the sample concentration?	X			
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	X			
Sample Duplicate Data Included in Lab Package?	X			FSI8-3.5-4.0
1) RPD criteria met? (RPD ≤20%) if both results are ≤4x RL or absolute difference ≤RL if either or both results are <4xRL.		X		See nonconformance table below.
2) Was a sample duplicate analyzed at the frequency of 1 per batch or 20 samples?	X			
Was a Laboratory Control Sample (LCS) Included in Lab Package?	X			
1) %R criteria met? (80-120%R).	X			
2) Was an LCS analyzed at the frequency of 1/batch or 20 samples?	X			
Were any Field Duplicate samples submitted with this SDG?	X			FSI8-1.0-1.5 and FSI8-1.0-1.5X
1) Were Field duplicate RPD criteria met? (RPD≤20% for both sample results >4xRL or absolute difference ≤ RL if either or both results are <4xRL.		X		
Were all sample quantitation and reporting requirements met?	X			
1) Were all solid samples reported with percent solids > 50% ?	X			
2) Were any samples analyzed or reported with dilutions?		X		
Miscellaneous Items	X			
1) For soils by 7196A, was the pH within a range of 7.0-8.0?	X			
2) For soils by 7199, was the pH within a range of 9.0-9.5?			X	
3) For aqueous by 7196A, was the pH with a range of 1.5-2.5?	X			
4) For soils (3060A), was the digestion temperature 90-95C for at least 60 minutes?	X			
5) For 7199, was each sample injected twice and was the RPD =20?			X	

Laboratory Blanks

Blank ID	Analyte	Result	QL	Units	Associated Samples
GN2891-MB1	CHROMIUM (HEXAVALENT)	-0.002	0.01	mg/L	FS-FB20140410

Matrix Spikes

Sample ID	Analyte	Analysis Batch	Matrix Spike	% Recovery	Lower Limit	Upper Limit	PDS	pH-adjusted PDS	PDS Limit
FSI8-3.5-4.0	CHROMIUM (HEXAVALENT)	GP79356/GN3139	Soluble	27.3	75	125	68.4	86	85-115
FSI8-3.5-4.0	CHROMIUM (HEXAVALENT)	GP79356/GN3139	Insoluble	71.4	75	125			
FSI8-3.5-4.0	CHROMIUM (HEXAVALENT)	GP79495/GN3464	Soluble	52.3	75	125	77.8		85-115
FSI8-3.5-4.0	CHROMIUM (HEXAVALENT)	GP79495/GN3464	Insoluble	83.3	75	125			

Lab Duplicates

Sample ID	Duplicate ID	Analyte	Sample Result	Qual	Duplicate Result	Qual	QL	Units	RPD
FSI8-3.5-4.0	ACTDJB64326R201404231056007	CHROMIUM (HEXAVALENT)	5.6		1.2		0.53	mg/kg	129.4

Field Duplicates

Sample ID	Duplicate ID	Analyte	Sample Result	Qual	Duplicate Result	Qual	QL	Units	RPD
FSI8-1.0-1.5	FSI8-1.0-1.5X	CHROMIUM (HEXAVALENT)	3.6		1.4		0.48	mg/kg	88

SDG#: JB64326
Batch: GN3139
 Cr+6 ICAL 04/15/14
 Soil
 (p. 50 of data pkg)

x - concentration	y - response
0	0
0.01	0.009
0.05	0.044
0.1	0.091
0.3	0.267
0.5	0.443
0.8	0.688
1	0.89

(p. 50 of data pkg)

AECOM Calculated Intercept	0.0008	OK	Reported intercept	0.0008
AECOM Slope	0.8788	OK	Reported Slope	0.8788
AECOM Calculated r	0.99976	OK	Reported r	0.99976

GP79356-B1
p.50

LCS calculation
 Background Absorbance 0
 Total absorbance 0.859
 Total absorbance - background 0.859
 Instrument Concentration 0.977
 Sample weight (mg/kg) 0.0025
 Final Volume (L) 0.1
 Dilution Factor 1

AECOM Calculated LCS Result (mg/Kg)	39.1	OK	Reported Result (mg/Kg)	39.1
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%R = Found/True*100 **p.30**

True Value (mg/kg) 40

AECOM Calculated %R	97.7	OK rounding	Reported %R	97.8
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MS calculation **JB64326-8 [FSI8-3.5-4.0]p.50**

Background reading 0
 Total absorbance 0.3
 Total absorbance - background 0.3
 Instrument Concentration 0.3404
 Sample weight (mg/kg) 0.00255
 Final Volume (L) 0.1
 Percent solids 0.76
 Dilution Factor 50

AECOM Calculated MS Result (mg/Kg)	878	OK	Reported Result (mg/Kg)	878
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%R = Found/True*100 **JB64326-8 [FSI8-3.5-4.0]p.32**

True Value (mg/kg) 1230
 Native concentration (mg/Kg) 0.71

AECOM%R	71.4	OK	Reported %R	71.4
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Percent Solids **JB64326-8 [FSI8-3.5-4.0]p.34**

Empty dish weight= 26.91
 Wet weight= 34.70
 Dry weight= 32.83

AECOM%solids =	76.0	OK	reported %solids=	76.0
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Reporting Limit**JB64326-8 [FSI8-3.5-4.0]p.16**

Low Standard	0.01
Initial weight (mg/kg)	0.0025
Final volume (L)	0.1
Percent solids	0.76
Dilution Factor	1

Reporting Limit	0.53	OK	Reported RL (mg/Kg)=	0.53
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Sample Calculations**JB64326-8 [FSI8-3.5-4.0]p.16, 50**

Background reading	0.015
Total absorbance	0.028
Total absorbance - background	0.013
Instrument Response	0.014
Sample weight (mg/kg)	0.00258
Final Volume (L)	0.1
Percent solids	0.76
Dilution Factor	1

AECOM Calculated Result (mg/Kg)	0.71	OK	Reported Result (mg/Kg)	0.71
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Client Name: PPG Industries	Project Number: 60154801.6001A
Site Location: PPG Garfield Avenue Supplemental Remedial Investigation (GARIS) Forrest Street Soil, Jersey City, NJ	Project Manager: William Spronz
Laboratory: Accutest, Dayton, NJ	Type of Validation: Limited
Laboratory Job No: JB64326A	Date Checked: 5/19/14
Validator: Paula DiMattei	Peer: Lisa Krowitz

ITEM	YES	NO	N/A	COMMENTS
Sample results included?	X			
Reporting Limits met project requirements?	X			
Field I.D. included?	X			
Laboratory I.D. included?	X			
Sample matrix included?	X			
Sample receipt temperature 2-6C?	X			
Signed COCs included?	X			
Date of sample collection included?	X			
Date of sample digestion included?	X			
Date of analysis included?	X			
Holding time met QC criteria? (Metals -180 days from sample collection; Mercury - 28 days from sample collection. If HT exceeded by 10 days R all results.	X			
Method reference included?	X			
Laboratory Case Narrative included?	X			

Definitions: MDL Method Detection Limit; %R Percent Recovery; RL Reporting Limit; RPD Relative Percent Difference; RSD Relative Standard Deviation ;Corr Correlation Coefficient.

ITEM	YES	NO	N/A	COMMENTS
Sample dilutions?		X		
Initial calibration documentation included in lab package?			X	NA for a Limited review
1) Calibrate daily or each time instrument is set up.			X	
2) ICP (6010) -Blank plus 1 standard? If no, reject (R) data.			X	
3) Hg (7470/7471) -Blank plus 5 standards? If no, reject (R) data.			X	
Initial Calibration Verification Standard (ICV) for ICP (6010) and Initial Calibration Check Standard (ICCS) for Hg (7470/7471) included in lab package?			X	
1) Analyzed immediately after initial calibration? If no, reject (R) data.			X	
2) %R criteria met? (90-110%). If no, J positive results for affected analyte(s) if %R between 80-89% and 111-120% and indicate bias; UJ non-detect results for affected analyte(s) if %R between 80-89% , and R all data for affected analyte(s) if %R 120%.			X	
3) Spot check ICV/ICCS results for several analytes.			X	
Continuing Calibration Verification Standard (CCV) for ICP (6010) and Calibration Check Standard (CCS) for Hg (7470/7471) included in Lab Package?			X	
1) Analyzed immediately after each ICV/ICC/CB and after every 10 samples? If no, reject (R) data.			X	
2) CCS and CCV from independent source and at mid-level of calibration curve. If no, reject (R) data.			X	
3) %R criteria met? (90-110%R). If no, J positive results for affected analyte(s) if %R between 80-89% and 111-120% and indicate bias; UJ non-detect results for affected analyte(s) if %R between 80-89% and R all data for affected analyte(s) if %R 120%.			X	
4) Spot check CCV/CCS results for several analytes.			X	
Low Calibration Standard (CRI) included in Lab Package?			X	
1) %R criteria met? - 50-150% for Co, Mn, Zn, by ICP-MS; Pb, Tl by 6010; 70-130% all others. If no, refer to ILM05.4 NJ SOP 5.A.2 for actions.			X	

ITEM	YES	NO	N/A	COMMENTS
Calibration Blanks			X	
1) Analyzed after daily calibration and after each ICV/ICC/CCV/CCS and after every 10 samples? If no, reject (R) data.			X	
2) Absolute value 10xCB result, no qualification.			X	
Method Blank Included in Lab Package?	X			
1) Method blank analyzed with each preparation batch or every SDG, or 1/20 samples? If no, reject (R) data, except no aqueous MB required for FB/EB if only soil samples were analyzed.	X			
2) Method blank analyzed 1/20 samples? If - MB 1/25, J sample results from 21-25; -MB >1/25, R sample results after 25th sample.	X			
3) MB results nondetect? If no, -sample result 3xMB but 10xMB, no qualification.		X		See nonconformance table below.
4) Negative MB result reported? If yes, -Positive sample result		X		
Field Blanks/Equipment Blanks Included in Lab Package?	X			FS-FB20140410
1) FB/EB result non-detect? If no, -sample result 3xFB/EB but 10xFB/EB, no qualification.	X			
ICP Interference Check Sample (ICS) included in Lab Package?			X	NA for a Limited review
1) Analyzed at beginning of analytical run? If no, reject (R) data.			X	
2) %R criteria met? (80-120%) If no, %R>120%, no qualification if sample result non-detect; %R between 121-150%, J positive results, biased high; %R between 50-79%, J/UJ results, biased low; %R150%, reject (R) result			X	
3) Spot check accuracy of %Rs			X	
Matrix Spike/Matrix Spike Duplicate Data Included in Lab Package?	X			Soil: FSI8-3.5-4.0
1) MS/MSD %R (75-125%R) and RPD (+20%) criteria met? - %R>125% J positive results for affected analyte(s) for all samples in the same batch/SDG, accept NDs; -%R		X		see nonconformance table below
2) Was a sample spiked at the frequency of 1/batch or 20 samples?	X			
3) Was the MS performed on a site sample?	X			
4) Was the MS performed on a FB/EB or TB? If yes, J all sample data.		X		

ITEM	YES	NO	N/A	COMMENTS
Post Digestion Spike			X	NA for a Limited review
1) %R criteria met? (75-125%R) - %R>125% J positive results for affected analyte(s) for all samples in the same batch/SDG, accept NDs.; - %R			X	
2) Was the spike performed on a FB/EB or TB? If yes, J all sample data.			X	
3) Was a sample spiked at the frequency of 1/batch or 20 samples?			X	
Laboratory Duplicate Data Included in Lab Package?		X		MS/MSD analysis was performed in lieu of a laboratory duplicate analysis.
Aqueous - If RPD is >20% but 5x the QL, estimate (J) results >the QL. - If RPD is >100%, reject R results >/= the QL.- If sample and/or duplicate is the QL, estimate (J) positive results 2x the QL, reject R non-detects and positive results			X	
Soil - If RPD is >35% but 5x the QL, estimate (J) results > the QL. - If RPD is >120%, reject results > the QL. - If sample and/or duplicate is 2x the QL, estimate (J) positive results 4x the QL, reject nondetects and positive results			X	
Was a Laboratory Control Sample (LCS) Included in Lab Package?	X			
1) LCS %R criteria met? (80-120%R). If no, J/UJ all affected analytes(s) for all samples in the same batch/SDG.	X			
2) Was an LCS analyzed at the frequency of 1/batch or 20 samples? If no, J/UJ affected analyte(s) for all samples in the same batch/SDG.	X			
Serial Dilution			X	NA for a Limited review.
1) %D(25xIDL (7000) or >10xIDL (6010) and %D >10% J positive results for affected analyte(s) for all samples in the same batch/SDG, accept NDs.			X	
2) Was the frequency 1/batch or 20 samples?			X	
3) Was a site sample used?			X	
4) Was a FB/EB or TB used? If yes, J all sample data.			X	
5) Spot check accuracy of %Ds.			X	
Field Duplicate Data included in Lab Package?	X			Soil: FS18-1.0-1.5 and FS18-1.0-1.5X
Aqueous - If RPD is >20% but 5x the QL, estimate (J) results > the QL. - If RPD is >100%, reject R results >/= the QL. - If sample and/or duplicate is the QL, estimate (J) positive results 2x the QL, reject R non-detects and positive results			X	

ITEM	YES	NO	N/A	COMMENTS
Soil - If RPD is >35% but 5x the QL, estimate (J) results > the QL. - If RPD is >120%, reject results > the QL. - If sample and/or duplicate is 2x the QL, estimate (J) positive results 4x the QL, reject nondetects and positive results	X			
Percent Solids data included in Lab Package?	X			
1) %Solids criteria (Reg 2 criteria) met? (>=50%)	X			

Laboratory Blanks

Blank ID	Analyte	Result	QL	Units	Associated Samples
MP78886-MB1	Chromium	0.11	0.98	mg/kg	All soil samples
	Nickel	0.48	3.9	mg/kg	

Matrix Spikes

Sample ID	Analyte	MS % Recovery	MSD % Recovery	Lower Limit	Upper Limit	RPD	RPD Limit
FSI8-3.5-4.0	ANTIMONY	47.6	48.5	75	125	ok	20
FSI8-3.5-4.0	CHROMIUM	143.1	ok	75	125	26.2	20

Data Validation Report

Project:	PPG Garfield Avenue Supplemental Remedial Investigation (GARIS) Forrest Street Soil	
Laboratory:	Accutest, Dayton, NJ	
Laboratory Job No.:	JB64510 and JB64510A	
Analysis/Method:	Hexavalent Chromium SW846 3060A/7196 Metals by ICP-AES/ SW846-6010	
Validation Level:	Full (Hexavalent chromium) Limited (Metals)	
Site Location/Address:	Forrest Street, Jersey City, NJ	
AECOM Project No:	60154801.6001A	
Prepared by:	Paula DiMattei /AECOM	Completed on: 05/20/2014
Reviewed by:	Lisa Krowitz /AECOM	File Name: JB64510_A_2014-05-20_DV Report-F

Introduction

The data were reviewed in accordance with the FSP-QAPP and the following NJDEP validation Standard Operating Procedures (SOP):

- NJDEP Office of Data Quality SOP 5.A.10, Rev 3 (September 2009), SOP for Analytical Data Validation of Hexavalent Chromium - for USEPA SW-846 Method 3060A, USEPA SW-846 Method 7196A and USEPA SW-846 Method 7199;
- NJDEP Office of Data Quality SOP 5.A.16, Rev 1 (May 2002), Quality Assurance Data Validation of Analytical Deliverables for Inorganics (based on USEPA SW-846 Methods)

The results of quality control data analyzed with site samples were used to assess the overall reliability of the data. The following qualifiers were used to identify data quality issues:

- U: Indicates the analyte was not detected in the sample above the sample reporting limit.
- J: Indicates the result was an estimated value; the associated numerical value was an approximate concentration of the analyte in the sample.
- UJ: Indicates the analyte was not detected above the reporting limit and the reporting limit was approximate.
- R: The sample result was rejected due to serious deficiencies; the presence or absence of the analyte could not be confirmed.
- RA: The sample result was rejected but is still considered usable.

Sample Information

The samples listed below were collected by AECOM on April 11, 2014 as part of the PPG Garfield Avenue Supplemental Remedial Investigation (GARIS) Forrest Street Soil sampling at the PPG Forrest Street, Jersey City, NJ. Only the samples and parameters listed below were validated.

Field ID	Laboratory ID	Matrix	Fraction
FS-FB20140411 (Equipment Blank)	JB64510-8	Aqueous	Hexavalent Chromium
FS-FB20140411 (Equipment Blank)	JB64510-8A	Aqueous	Metals
FSI7-0.5-1.0	JB64510-1	Soil	Hexavalent Chromium
FSI7-0.5-1.0	JB64510-1A	Soil	Metals
FSI7-10.0-10.5	JB64510-6	Soil	Hexavalent Chromium
FSI7-10.0-10.5	JB64510-6A	Soil	Metals
FSI7-10.5-11.0	JB64510-7	Soil	Hexavalent Chromium
FSI7-10.5-11.0	JB64510-7A	Soil	Metals
FSI7-2.0-2.5	JB64510-2	Soil	Hexavalent Chromium
FSI7-2.0-2.5	JB64510-2A	Soil	Metals
FSI7-4.0-4.5	JB64510-3	Soil	Hexavalent Chromium
FSI7-4.0-4.5	JB64510-3A	Soil	Metals
FSI7-6.0-6.5	JB64510-4	Soil	Hexavalent Chromium
FSI7-6.0-6.5	JB64510-4A	Soil	Metals
FSI7-8.0-8.5	JB64510-5	Soil	Hexavalent Chromium
FSI7-8.0-8.5	JB64510-5A	Soil	Metals
FSI8-10.0-10.5	JB64510-13	Soil	Hexavalent Chromium
FSI8-10.0-10.5	JB64510-13A	Soil	Metals
FSI8-4.0-4.5	JB64510-9	Soil	Hexavalent Chromium
FSI8-4.0-4.5	JB64510-9A	Soil	Metals
FSI8-6.0-6.5	JB64510-10	Soil	Hexavalent Chromium
FSI8-6.0-6.5	JB64510-10A	Soil	Metals
FSI8-6.0-6.5X (Field Duplicate of FSI8-6.0-6.5)	JB64510-11	Soil	Hexavalent Chromium
FSI8-6.0-6.5X (Field Duplicate of FSI8-6.0-6.5)	JB64510-11A	Soil	Metals
FSI8-8.0-8.5	JB64510-12	Soil	Hexavalent Chromium
FSI8-8.0-8.5	JB64510-12A	Soil	Metals

The samples were collected following the procedures detailed in the Remedial Investigation Work Plan - Soil for Non-Residential Chromate Chemical Production Waste Sites 114, 132, 133, 135, 137, 143, and 186, Jersey City, New Jersey, or applicable proposal or work plan, and the Field Sampling Plan/Quality Assurance Project Plan for Non-Residential and Residential Chromium Sites Hudson County, New Jersey (December 2011).

General Comments

The data package was complete. Quality control (QC) issues identified during validation are discussed below. Refer to the Target Analyte Summary Hit(s) in Attachment A for a listing of all detected results, qualified results, and associated qualifications, where applicable. The nonconformances for each section discussed below are presented in Attachment B.

Hexavalent Chromium

MS Results

Sample FSI8-10.0-10.5 [JB64510-13] was selected for the matrix spike (MS) analysis associated with the soil samples in this SDG and was used for supporting data quality recommendations. The soluble and insoluble MS recoveries were 88.0% and 92.1%, respectively; which met the quality control (QC) criteria of 75-125%. The post digestion spike (PDS) recovery was 100%, which met the PDS criteria of 85-115%. No data qualification was required on the basis of spike recoveries.

Sample Results

Reported results (flagged B by the laboratory) that were less than the reporting limit (RL), but greater than or equal to the method detection limit (MDL) are approximate values and have been qualified as estimated (J).

Metals

MS Results

MS/MSD analysis was performed on sample FSI8-10.0-10.5 [JB64510-13A] in association with the Method 6010 analysis of the soil samples in this SDG.

The recoveries of antimony did not meet the QC criteria of 75-125%. The positive and nondetect results for antimony in all soil samples were qualified as estimated (J/UJ) with a potential low bias.

Sample Results

Reported results (flagged B by the laboratory) that were less than the reporting limit (RL), but greater than or equal to the method detection limit (MDL) are approximate values that have been qualified as estimated (J).

Data Quality and Usability

In general, these data appear to be valid and may be used for decision-making purposes. No data were rejected. Qualified results, if applicable, are presented in Attachments A and B.

Sample results for antimony qualified due to low MS recoveries are usable as estimated values with the potential for low bias.

Sample results reported between the MDL and RL are usable as estimated values with an unknown directional bias.

ATTACHMENTS

Attachment A: Target Analyte Summary Hitlist(s)

Attachment B: Data Validation Report Form

Attachment A

Target Analyte Summary Hitlist(s)

Soil Target Analyte Summary Hit List (Hexavalent Chromium)

Site Name PPG Garfield Avenue Supplemental Remedial Investigation (GARIS) Forrest Street
Sampling Date April 11, 2014
Lab Name/ID Accutest, Dayton, NJ
SDG No JB64510
Sample Matrix Soil
Trip Blank ID NA
Field Blank ID FS-FB20140411

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
FSI7-0.5-1.0	JB64510-1	CHROMIUM (HEXAVALENT)	U	0.98	0.98	0.49		
FSI7-10.0-10.5	JB64510-6	CHROMIUM (HEXAVALENT)	U	0.50B	0.50	0.51	Qualify	31
FSI7-10.5-11.0	JB64510-7	CHROMIUM (HEXAVALENT)	U	0.40B	0.40	0.51	Qualify	31
FSI7-2.0-2.5	JB64510-2	CHROMIUM (HEXAVALENT)	U	0.92	0.92	0.53		
FSI7-4.0-4.5	JB64510-3	CHROMIUM (HEXAVALENT)	U	0.57	0.57	0.53		
FSI7-6.0-6.5	JB64510-4	CHROMIUM (HEXAVALENT)	U	0.38B	0.38	0.59	Qualify	31
FSI7-8.0-8.5	JB64510-5	CHROMIUM (HEXAVALENT)	U	0.56	0.56	0.50		
FSI8-10.0-10.5	JB64510-13	CHROMIUM (HEXAVALENT)	U	0.53	0.53	0.47		
FSI8-4.0-4.5	JB64510-9	CHROMIUM (HEXAVALENT)	U	0.49B	0.49	0.55	Qualify	31
FSI8-6.0-6.5	JB64510-10	CHROMIUM (HEXAVALENT)	U	0.24B	0.24	0.54	Qualify	31
FSI8-8.0-8.5	JB64510-12	CHROMIUM (HEXAVALENT)	U	0.16B	0.16	0.53	Qualify	31

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

NJDEP Laboratory Footnote

1. The value reported is less than or equal to 3x the value in the preparation/reagent blank. It is the policy of NJDEP-DPFSR to negate the reported value due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.

2. The value reported is greater than three (3) times but less than ten (10) times the value in the preparation/reagent blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to the preparation/reagent blank contamination. The "B" qualifier alerts the end-user to the presence of this analyte in the preparation/reagent blank.
3. The value reported is less than or equal to three (3) times the value in the trip/field blank. It is the policy of NJDEP-DPF SR to negate the reported value as due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
4. The value reported is greater than three (3) times but less than ten (10) times the value in the trip/field blanks and is considered "real". However, the reported value must be quantitatively qualified "J" due to trip/field blank contamination.
5. The concentration reported by the laboratory is incorrectly calculated.
6. The laboratory failed to report the presence of the analyte in the sample.
7. The reported Hexavalent Chromium value was qualified because the Calibration Check Standard was not within the recovery range (90-110 percent).
8. In the Duplicate Sample Analysis, Hexavalent Chromium fell outside the control limits of ≤ 20 percent for sample results $> 4xRL$ or $+ RL$ for sample results $< 4xRL$. Therefore, the result was qualified.
9. This analyte was rejected because the laboratory performed the Duplicate Analysis on a field blank.
10. The reported value was qualified because the PVS recovery was greater than 115 percent.
11. The reported value was qualified because the PVS recovery was less than 85 percent.
12. The non-detected value was qualified (UJ) because the PVS recovery was less than 85 percent. The possibility of a false negative exists.
13. The reported analyte was qualified because the associated Calibration Blank result was greater than the MDL.
14. The laboratory made a transcription error. No hits were found in the raw data.
15. This analyte is qualified or rejected because the laboratory exceeded the holding time for digestion and/or analysis.

16. The laboratory subtracted the preparation/reagent blank from the sample result. The Reviewer's calculation puts the preparation/reagent blank back into the result.
17. The photocopy is unreadable. Therefore, the QA reviewer cannot read the laboratory's reported concentration result.
18. The reported value was qualified because the predigestion spike recovery was less than 75 %, but greater than 50%.
19. The reported value was qualified because the predigestion spike recovery was greater than 125 percent.
20. The non-detected value was qualified (UJ) because the redigestion spike recovery was less than 75 percent. The possibility of a false negative exists.
21. The reported result was qualified or rejected because the laboratory did not record the pH value(s) of the sample in a laboratory notebook.
22. The reported value was qualified (J/UJ) because the sample moisture content exceeded 50 percent.
23. The sample result was rejected because the soluble and insoluble matrix spike recoveries were less than 50%.
24. The detected sample result was qualified (J) because the incorrect spike concentration was used.
25. The reported sample results were rejected because the predigestion spike recovery was greater than 150 percent.
26. The reported sample results were rejected because the redigestion spike recovery was greater than 150 percent.
27. The reported value was qualified (J) because the redigestion spike recovery was less than 75 percent.
28. The reported value was qualified (J/UJ) because the sample digestion temperature was less than 90C.
29. In the Field Duplicate Sample Analysis, Hexavalent Chromium fell outside the control limits of $\leq 20\%$ for sample results $> 4xRL$ or $+ RL$ for sample results $< 4xRL$. Therefore, the result was qualified.
30. The reported value was qualified as estimated (J/UJ) but the bias is uncertain due to both high and low MS recoveries.
31. The reported result was greater than the MDL but less than the RL and qualified (J) as estimated by the laboratory.

32. The reported value was qualified because the sample replicate precision criterion of $\leq 20\%$ for method 7199 was exceeded.
33. The reported value was qualified (J/UJ) because the laboratory control sample (LCS) recovery was less than 80%.
34. The reported value was qualified (J) because the laboratory control sample (LCS) recovery was greater than 120%.
35. The reported result was qualified because the matrix spike analysis was not performed at the proper frequency.
36. The reported result was qualified because the laboratory duplicate analysis was not performed at the proper frequency.
37. The result was qualified because the cooler temperature upon sample receipt exceeded 6C.
38. The reported value was qualified because the redigestion spike recovery was greater than 125 percent.
39. The reported result was rejected because the laboratory failed to perform the reanalysis due to insufficient sample volume.
40. The reported results was qualified because the laboratory failed to analyze an ending CCB.
41. The reported result was qualified because the laboratory failed to make the proper method specific pH adjustment.
42. The reported result was rejected because the laboratory failed to reanalyze the MS and associated sample(s) due to failed MS recoveries.

Soil Target Analyte Summary Hit List (Metals)

Site Name PPG Garfield Avenue Supplemental Remedial Investigation (GARIS) Forrest Street
Sampling Date April 11, 2014
Lab Name/ID Accutest, Dayton, NJ
SDG No JB64510A
Sample Matrix Soil
Trip Blank ID NA
Field Blank ID FS-FB20140411

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
FSI7-0.5-1.0	JB64510-1A	ANTIMONY	U	U	U	2.6	Qualify	15
FSI7-0.5-1.0	JB64510-1A	CHROMIUM	U	16.2	16.2	1.3		
FSI7-0.5-1.0	JB64510-1A	NICKEL	U	14.1	14.1	5.1		
FSI7-0.5-1.0	JB64510-1A	VANADIUM	U	20.3	20.3	6.4		
FSI7-10.0-10.5	JB64510-6A	ANTIMONY	U	U	U	2.4	Qualify	15
FSI7-10.0-10.5	JB64510-6A	CHROMIUM	U	12.7	12.7	1.2		
FSI7-10.0-10.5	JB64510-6A	NICKEL	U	15.1	15.1	4.9		
FSI7-10.0-10.5	JB64510-6A	VANADIUM	U	14.6	14.6	6.1		
FSI7-10.5-11.0	JB64510-7A	ANTIMONY	U	U	U	2.4	Qualify	15
FSI7-10.5-11.0	JB64510-7A	CHROMIUM	U	15.2	15.2	1.2		
FSI7-10.5-11.0	JB64510-7A	NICKEL	U	16.7	16.7	4.9		
FSI7-10.5-11.0	JB64510-7A	VANADIUM	U	15.2	15.2	6.1		
FSI7-2.0-2.5	JB64510-2A	ANTIMONY	U	U	U	2.5	Qualify	15
FSI7-2.0-2.5	JB64510-2A	CHROMIUM	U	15.7	15.7	1.3		
FSI7-2.0-2.5	JB64510-2A	NICKEL	U	16.3	16.3	5.1		
FSI7-2.0-2.5	JB64510-2A	VANADIUM	U	20.7	20.7	6.4		
FSI7-4.0-4.5	JB64510-3A	ANTIMONY	U	0.39B	0.39	2.5	Qualify	15,23
FSI7-4.0-4.5	JB64510-3A	CHROMIUM	U	14.7	14.7	1.2		

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
FSI7-4.0-4.5	JB64510-3A	NICKEL	U	13.9	13.9	4.9		
FSI7-4.0-4.5	JB64510-3A	THALLIUM	U	0.50B	0.50	1.2	Qualify	23
FSI7-4.0-4.5	JB64510-3A	VANADIUM	U	19.2	19.2	6.1		
FSI7-6.0-6.5	JB64510-4A	ANTIMONY	U	U	U	2.6	Qualify	15
FSI7-6.0-6.5	JB64510-4A	CHROMIUM	U	16.4	16.4	1.3		
FSI7-6.0-6.5	JB64510-4A	NICKEL	U	15.7	15.7	5.3		
FSI7-6.0-6.5	JB64510-4A	VANADIUM	U	20.0	20.0	6.6		
FSI7-8.0-8.5	JB64510-5A	ANTIMONY	U	U	U	2.2	Qualify	15
FSI7-8.0-8.5	JB64510-5A	CHROMIUM	U	12.4	12.4	1.1		
FSI7-8.0-8.5	JB64510-5A	NICKEL	U	15.8	15.8	4.5		
FSI7-8.0-8.5	JB64510-5A	VANADIUM	U	16.4	16.4	5.6		
FSI8-10.0-10.5	JB64510-13A	ANTIMONY	U	0.56B	0.56	2.5	Qualify	15,23
FSI8-10.0-10.5	JB64510-13A	CHROMIUM	U	16.7	16.7	1.2		
FSI8-10.0-10.5	JB64510-13A	NICKEL	U	12.0	12.0	4.9		
FSI8-10.0-10.5	JB64510-13A	VANADIUM	U	26.2	26.2	6.1		
FSI8-4.0-4.5	JB64510-9A	ANTIMONY	U	0.44B	0.44	2.1	Qualify	15,23
FSI8-4.0-4.5	JB64510-9A	NICKEL	U	14.2	14.2	4.2		
FSI8-4.0-4.5	JB64510-9A	THALLIUM	U	0.45B	0.45	1.1	Qualify	23
FSI8-4.0-4.5	JB64510-9A	VANADIUM	U	18.3	18.3	5.3		
FSI8-4.0-4.5	JB64510-9A	CHROMIUM	U	21.3	21.3	1.1		
FSI8-6.0-6.5	JB64510-10A	ANTIMONY	U	U	U	2.6	Qualify	15
FSI8-6.0-6.5	JB64510-10A	CHROMIUM	U	14.2	14.2	1.3		
FSI8-6.0-6.5	JB64510-10A	NICKEL	U	13.7	13.7	5.2		
FSI8-6.0-6.5	JB64510-10A	VANADIUM	U	17.5	17.5	6.5		
FSI8-6.0-6.5X	JB64510-11A	ANTIMONY	U	U	U	2.5	Qualify	15

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
FSI8-6.0-6.5X	JB64510-11A	CHROMIUM	U	13.9	13.9	1.3		
FSI8-6.0-6.5X	JB64510-11A	NICKEL	U	14.1	14.1	5.0		
FSI8-6.0-6.5X	JB64510-11A	VANADIUM	U	17.9	17.9	6.3		
FSI8-8.0-8.5	JB64510-12A	ANTIMONY	U	U	U	2.0	Qualify	15
FSI8-8.0-8.5	JB64510-12A	CHROMIUM	U	17.0	17.0	1.0		
FSI8-8.0-8.5	JB64510-12A	NICKEL	U	14.3	14.3	4.1		
FSI8-8.0-8.5	JB64510-12A	THALLIUM	U	0.61B	0.61	1.0	Qualify	23
FSI8-8.0-8.5	JB64510-12A	VANADIUM	U	22.3	22.3	5.1		

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

NJDEP Laboratory Footnote

1. The value reported is less than or equal to 3x the value in the method blank. It is the policy of NJDEP-DPFSR to negate the reported value due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
2. The value reported is greater than three (3) but less than ten (10) times the value in the method blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to the method blank contamination. The "B" qualifier alerts the end-user to the presence of this analyte in the method blank.
3. The value reported is less than or equal to 3x the value in the trip/field blank. It is the policy of NJDEP-DPFSR to negate the reported value as due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
4. The value reported is greater than 3x but less than ten (10) the value in the trip/field blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to trip/field blank contamination.
5. The concentration reported by the laboratory is incorrectly calculated.
6. The laboratory failed to report the presence of the analyte in the sample.

7. The reported metal value was qualified because the Calibration Verification Standard was not within the recovery range (90-110 percent).
8. In the MS/MSD Sample Analysis, this analyte fell outside the control limits of 20% RPD. Therefore, the result was qualified.
9. This analyte was qualified because the laboratory performed the MS/MSD Analysis on a field blank.
10. The reported analyte was qualified because the associated Calibration Blank result was greater than the MDL.
11. The reported value was qualified because serial dilution analysis was not within QC limit of 10% D.
12. This analyte is rejected because the laboratory exceeded the holding time for digestion and analysis.
13. The laboratory subtracted the method blank from the sample result. The reviewer's calculation has added the method blank result to the reported concentration.
14. The photocopy submitted is illegible. Therefore, the QA reviewer cannot read the laboratory's reported concentration result.
15. The reported or nondetected value was qualified because the MS/MSD spike recovery was less than 75 percent.
16. The reported value was qualified because the MS/MSD spike recovery was greater than 125 percent.
17. The reported value was qualified as estimated (J/UJ) but the bias is uncertain due to both high and low MS recoveries.
18. The reported values were qualified because the laboratory duplicate exceeded 35 percent RPD for results greater than 5X the reporting limit or the absolute difference exceeded two times the reporting limit for sample result less than 5 times the reporting limit.
19. The reported value was qualified because the field duplicate exceeded 35 percent RPD for results greater than 5X the reporting limit or the absolute difference exceeded two times the reporting limit for sample result less than 5 times the reporting limit.
20. The reported value was qualified because the LCS recovery was less than 80 percent.
21. The reported value was qualified because the sample moisture content was greater than 50 percent.
22. The reported value was rejected because the field duplicate absolute difference was greater than 4 times the RL or the RPD was greater than 120%.

23. The reported result was greater than the MDL but less than the RL and qualified (J) as estimated by the laboratory.
24. The field duplicate absolute difference exceeded two times the reporting limit for sample result less than 5 times the reporting limit.
25. The reported value was qualified because the LCS recovery was greater than 120 percent.

Attachment B

Data Validation Report Form

Client Name: PPG Industries	Project Number: 60154801.6001A
Site Location: PPG Garfield Avenue Supplemental Remedial Investigation (GARIS) Forrest Street Soil, Jersey City, NJ	Project Manager: William Spronz
Laboratory: Accutest, Dayton, NJ	Type of Validation: Full
Laboratory Job No: JB64510	Date Checked: 5/20/14
Validator: Paula DiMattei	Peer: Lisa Krowitz

ITEM	YES	NO	N/A	COMMENTS
Sample results included?	X			
Reporting Limits met project requirements?	X			
Field I.D. included?	X			
Laboratory I.D. included?	X			
Sample matrix included?	X			
Sample receipt temperature 2-6C?	X			
Signed COCs included?	X			
Date of sample collection included?	X			
Date of sample digestion included?	X			
Holding time to digestion met criteria? (Soils -30 days from collection to digestion.)	X			
Date of analysis included?	X			
Holding time to analysis met criteria? (Soils -168 hours from digestion to analysis; Aqueous - 24 hours from collection to analysis.)	X			
Method reference included?	X			
Laboratory Case Narrative included?	X			

Definitions: MDL Method Detection Limit; %R Percent Recovery; RL Reporting Limit; RPD Relative Percent Difference; RSD Relative Standard Deviation :Corr Correlation Coefficient.

ITEM	YES	NO	N/A	COMMENTS
Initial calibration documentation included in lab package?	X			
1) Blank plus 4 standards (7196A) or blank plus 3 standards (7199)	X			
2) Correlation coefficient of =0.995 (7196A) or =0.999 (7199)	X			
3) Calibrate daily or each time instrument is set up.	X			
Calibration Check Standard (CCS) for 7196A and Quality Control Sample (QCS) for 7199 Included in Lab Package?	X			
1) %R criteria met? (90 - 110%)	X			
2) Correct frequency of one per every 10 samples	X			
3) CCS and QCS from independent source and at mid-level of calibration curve	X			
Calibration Blanks	X			
1) Analyzed prior to initial calibration standards and after each CCS/QCS?	X			
2) Absolute value should not exceed MDL.	X			
Method Blank, Field Blanks and/or Equipment Blanks Included in Lab Package?	X			FS-FB20140411
1) Method blank analyzed with each preparation batch?	X			
2) Absolute value should not exceed MDL.	X			
Eh and pH Data	X			
1) Eh and pH data was included and plotted for all samples?	X			
Soluble Matrix Spike Data Included in Lab Package?	X			Soil: FS18-10.0-10.5
1) Soluble Matrix %R criteria met? (75-125%R).	X			
2) Was the spike concentration 40 mg/Kg or twice the sample concentration?	X			
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	X			
Insoluble Matrix Spike Data Included in Lab Package?	X			
1) Insoluble Matrix %R criteria met? (75-125%R).	X			
2) Was the spike concentration around 400 to 800 mg/Kg?	X			
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	X			

ITEM	YES	NO	N/A	COMMENTS
Post Digestion Spike	X			
1) Post Digestion Spike %R criteria met? (85-115%R).	X			
2) Was the spike concentration 40 mg/Kg or twice the sample concentration?	X			
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	X			
Sample Duplicate Data Included in Lab Package?	X			Soil: FS18-10.0-10.5
1) RPD criteria met? (RPD ≤20%) if both results are ≤4x RL or absolute difference ≤RL if either or both results are <4xRL.	X			
2) Was a sample duplicate analyzed at the frequency of 1 per batch or 20 samples?	X			
Was a Laboratory Control Sample (LCS) Included in Lab Package?	X			
1) %R criteria met? (80-120%R).	X			
2) Was an LCS analyzed at the frequency of 1/batch or 20 samples?	X			
Were any Field Duplicate samples submitted with this SDG?	X			FS18-6.0-6.5 and FS18-6.0-6.5X
1) Were Field duplicate RPD criteria met? (RPD≤20% for both sample results >4xRL or absolute difference ≤ RL if either or both results are <4xRL.	X			
Were all sample quantitation and reporting requirements met?	X			
1) Were all solid samples reported with percent solids > 50% ?	X			
2) Were any samples analyzed or reported with dilutions?		X		
Miscellaneous Items	X			
1) For soils by 7196A, was the pH within a range of 7.0-8.0?	X			
2) For soils by 7199, was the pH within a range of 9.0-9.5?			X	
3) For aqueous by 7196A, was the pH with a range of 1.5-2.5?	X			
4) For soils (3060A), was the digestion temperature 90-95C for at least 60 minutes?	X			
5) For 7199, was each sample injected twice and was the RPD =20?			X	

SDG#: JB64510
Batch: GN3240
 Cr+6 ICAL 04/20/14
 Soil
 (p. 62 of data pkg)

x - concentration	y - response
0	0
0.01	0.01
0.05	0.046
0.1	0.093
0.3	0.263
0.5	0.451
0.8	0.704
1	0.893

(p. 62 of data pkg)

AECOM Calculated Intercept	0.0012	OK	Reported intercept	0.0012
AECOM Slope	0.8877	OK	Reported Slope	0.8877
AECOM Calculated r	0.99992	OK	Reported r	0.99992

GP79392-B1
p.62

LCS calculation

Background Absorbance	0
Total absorbance	0.834
Total absorbance - background	0.834
Instrument Concentration	0.938
Sample weight (mg/kg)	0.0025
Final Volume (L)	0.1
Dilution Factor	1

AECOM Calculated LCS Result (mg/Kg)	37.5	OK	Reported Result (mg/Kg)	37.5
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%R = Found/True*100

p. 38

True Value (mg/kg)	40
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AECOM Calculated %R	93.8	OK	Reported %R	93.8
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MS calculation

JB64510-13 [FSI8-10.0-10.5]p.62

Background reading	0
Total absorbance	0.288
Total absorbance - background	0.288
Instrument Concentration	0.3230
Sample weight (mg/kg)	0.00252
Final Volume (L)	0.1
Percent solids	0.855
Dilution Factor	50

AECOM Calculated MS Result (mg/Kg)	750	OK	Reported Result (mg/Kg)	750
------------------------------------	-----	----	-------------------------	-----

%R = Found/True*100

JB64510-13 [FSI8-10.0-10.5]p.40

True Value (mg/kg)	814
Native concentration (mg/Kg)	0.53

AECOM%R	92.0	OK rounding	Reported %R	92.1
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Percent Solids

JB64510-13 [FSI8-10.0-10.5]p.42

Empty dish weight=	26.33
Wet weight=	35.28
Dry weight=	33.98

AECOM%solids =	85.5	OK	reported %solids=	85.5
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Reporting Limit**JB64510-13 [FSI8-10.0-10.5]p.22**

Low Standard	0.01		
Initial weight (mg/kg)	0.00243		
Final volume (L)	0.1		
Percent solids	0.855		
Dilution Factor	1		
Reporting Limit	0.48	OK rounding	Reported RL (mg/Kg)= 0.47

Sample Calculations**JB64510-13 [FSI8-10.0-10.5]p.22, 62**

Background reading	0.004		
Total absorbance	0.015		
Total absorbance - background	0.011		
Instrument Response	0.011		
Sample weight (mg/kg)	0.00243		
Final Volume (L)	0.1		
Percent solids	0.855		
Dilution Factor	1		
AECOM Calculated Result (mg/Kg)	0.53	OK	Reported Result (mg/Kg) 0.53

Client Name: PPG Industries	Project Number: 60154801.6001A
Site Location: PPG Garfield Avenue Supplemental Remedial Investigation (GARIS) Forrest Street Soil, Jersey City, NJ	Project Manager: William Spronz
Laboratory: Accutest, Dayton, NJ	Type of Validation: Limited
Laboratory Job No: JB64510A	Date Checked: 5/20/14
Validator: Paula DiMattei	Peer: Lisa Krowitz

ITEM	YES	NO	N/A	COMMENTS
Sample results included?	X			
Reporting Limits met project requirements?	X			
Field I.D. included?	X			
Laboratory I.D. included?	X			
Sample matrix included?	X			
Sample receipt temperature 2-6C?	X			
Signed COCs included?	X			
Date of sample collection included?	X			
Date of sample digestion included?	X			
Date of analysis included?	X			
Holding time met QC criteria? (Metals -180 days from sample collection; Mercury - 28 days from sample collection. If HT exceeded by 10 days R all results.	X			
Method reference included?	X			
Laboratory Case Narrative included?	X			

Definitions: MDL Method Detection Limit; %R Percent Recovery; RL Reporting Limit; RPD Relative Percent Difference; RSD Relative Standard Deviation ;Corr Correlation Coefficient.

ITEM	YES	NO	N/A	COMMENTS
Sample dilutions?		X		
Initial calibration documentation included in lab package?			X	NA for a Limited review
1) Calibrate daily or each time instrument is set up.			X	
2) ICP (6010) -Blank plus 1 standard? If no, reject (R) data.			X	
3) Hg (7470/7471) -Blank plus 5 standards? If no, reject (R) data.			X	
Initial Calibration Verification Standard (ICV) for ICP (6010) and Initial Calibration Check Standard (ICCS) for Hg (7470/7471) included in lab package?			X	
1) Analyzed immediately after initial calibration? If no, reject (R) data.			X	
2) %R criteria met? (90-110%). If no, J positive results for affected analyte(s) if %R between 80-89% and 111-120% and indicate bias; UJ non-detect results for affected analyte(s) if %R between 80-89% , and R all data for affected analyte(s) if %R 120%.			X	
3) Spot check ICV/ICCS results for several analytes.			X	
Continuing Calibration Verification Standard (CCV) for ICP (6010) and Calibration Check Standard (CCS) for Hg (7470/7471) included in Lab Package?			X	
1) Analyzed immediately after each ICV/ICC/CB and after every 10 samples? If no, reject (R) data.			X	
2) CCS and CCV from independent source and at mid-level of calibration curve. If no, reject (R) data.			X	
3) %R criteria met? (90-110%R). If no, J positive results for affected analyte(s) if %R between 80-89% and 111-120% and indicate bias; UJ non-detect results for affected analyte(s) if %R between 80-89% and R all data for affected analyte(s) if %R 120%.			X	
4) Spot check CCV/CCS results for several analytes.			X	
Low Calibration Standard (CRI) included in Lab Package?			X	
1) %R criteria met? - 50-150% for Co, Mn, Zn, by ICP-MS; Pb, Tl by 6010; 70-130% all others. If no, refer to ILM05.4 NJ SOP 5.A.2 for actions.			X	

ITEM	YES	NO	N/A	COMMENTS
Calibration Blanks			X	
1) Analyzed after daily calibration and after each ICV/ICC/CCV/CCS and after every 10 samples? If no, reject (R) data.			X	
2) Absolute value 10xCB result, no qualification.			X	
Method Blank Included in Lab Package?	X			
1) Method blank analyzed with each preparation batch or every SDG, or 1/20 samples? If no, reject (R) data, except no aqueous MB required for FB/EB if only soil samples were analyzed.	X			
2) Method blank analyzed 1/20 samples? If - MB 1/25, J sample results from 21-25; -MB >1/25, R sample results after 25th sample.	X			
3) MB results nondetect? If no, -sample result 3xMB but 10xMB, no qualification.	X			
4) Negative MB result reported? If yes, -Positive sample result		X		
Field Blanks/Equipment Blanks Included in Lab Package?	X			FS-FB20140411
1) FB/EB result non-detect? If no, -sample result 3xFB/EB but 10xFB/EB, no qualification.	X			
ICP Interference Check Sample (ICS) included in Lab Package?			X	NA for a Limited review
1) Analyzed at beginning of analytical run? If no, reject (R) data.			X	
2) %R criteria met? (80-120%) If no, %R>120%, no qualification if sample result non-detect; %R between 121-150%, J positive results, biased high; %R between 50-79%, J/UJ results, biased low; %R150%, reject (R) result			X	
3) Spot check accuracy of %Rs			X	
Matrix Spike/Matrix Spike Duplicate Data Included in Lab Package?	X			Soil: FSI8-10.0-10.5
1) MS/MSD %R (75-125%R) and RPD (+20%) criteria met? - %R>125% J positive results for affected analyte(s) for all samples in the same batch/SDG, accept NDs; -%R		X		
2) Was a sample spiked at the frequency of 1/batch or 20 samples?	X			
3) Was the MS performed on a site sample?	X			
4) Was the MS performed on a FB/EB or TB? If yes, J all sample data.		X		

ITEM	YES	NO	N/A	COMMENTS
Post Digestion Spike			X	NA for a Limited review
1) %R criteria met? (75-125%R) - %R>125% J positive results for affected analyte(s) for all samples in the same batch/SDG, accept NDs.; - %R			X	
2) Was the spike performed on a FB/EB or TB? If yes, J all sample data.			X	
3) Was a sample spiked at the frequency of 1/batch or 20 samples?			X	
Laboratory Duplicate Data Included in Lab Package?		X		MS/MSD analyses were performed in lieu of a laboratory duplicate analysis.
Aqueous - If RPD is >20% but 5x the QL, estimate (J) results >the QL. - If RPD is >100%, reject R results >= the QL.- If sample and/or duplicate is the QL, estimate (J) positive results 2x the QL, reject R non-detects and positive results			X	
Soil - If RPD is >35% but 5x the QL, estimate (J) results > the QL. - If RPD is >120%, reject results > the QL. - If sample and/or duplicate is 2x the QL, estimate (J) positive results 4x the QL, reject nondetects and positive results			X	
Was a Laboratory Control Sample (LCS) Included in Lab Package?	X			
1) LCS %R criteria met? (80-120%R). If no, J/UJ all affected analytes(s) for all samples in the same batch/SDG.	X			
2) Was an LCS analyzed at the frequency of 1/batch or 20 samples? If no, J/UJ affected analyte(s) for all samples in the same batch/SDG.	X			
Serial Dilution			X	NA for a Limited review
1) %D(25xIDL (7000) or >10xIDL (6010) and %D >10% J positive results for affected analyte(s) for all samples in the same batch/SDG, accept NDs.			X	
2) Was the frequency 1/batch or 20 samples?			X	
3) Was a site sample used?			X	
4) Was a FB/EB or TB used? If yes, J all sample data.			X	
5) Spot check accuracy of %Ds.			X	

ITEM	YES	NO	N/A	COMMENTS
Field Duplicate Data included in Lab Package?	X			FSI8-6.0-6.5 and FSI8-6.0-6.5X
Aqueous - If RPD is >20% but 5x the QL, estimate (J) results > the QL. - If RPD is >100%, reject R results >= the QL. - If sample and/or duplicate is the QL, estimate (J) positive results 2x the QL, reject R non-detects and positive results			X	
Soil - If RPD is >35% but 5x the QL, estimate (J) results > the QL. - If RPD is >120%, reject results > the QL. - If sample and/or duplicate is 2x the QL, estimate (J) positive results 4x the QL, reject nondetects and positive results	X			
Percent Solids data included in Lab Package?	X			
1) %Solids criteria (Reg 2 criteria) met? (>=50%)	X			

Matrix Spikes

Sample ID	Analyte	MS % Recovery	MSD % Recovery	Lower Limit	Upper Limit
FSI8-10.0-10.5	ANTIMONY	45.9	41.1	75	125

Data Validation Report

Project:	PPG Garfield Avenue Supplemental Remedial Investigation (GARIS) Forrest Street Soils	
Laboratory:	Accutest, Dayton, NJ	
Laboratory Job No.:	JB64643 and JB64643A	
Analysis/Method:	Hexavalent Chromium SW846 3060A/7196 Metals by ICP-AES/ SW846-6010	
Validation Level:	Full (Hexavalent chromium) Limited (Metals)	
Site Location/Address:	Forrest Street, Jersey City, NJ	
AECOM Project No:	60154801.6001A	
Prepared by:	Paula DiMattei /AECOM	Completed on: 05/20/2014
Reviewed by:	Lisa Krowitz /AECOM	File Name: JB64643_A_2014-05-20_DV Report-F

Introduction

The data were reviewed in accordance with the FSP-QAPP and the following NJDEP validation Standard Operating Procedures (SOP):

- NJDEP Office of Data Quality SOP 5.A.10, Rev 3 (September 2009), SOP for Analytical Data Validation of Hexavalent Chromium - for USEPA SW-846 Method 3060A, USEPA SW-846 Method 7196A and USEPA SW-846 Method 7199;
- NJDEP Office of Data Quality SOP 5.A.16, Rev 1 (May 2002), Quality Assurance Data Validation of Analytical Deliverables for Inorganics (based on USEPA SW-846 Methods)

The results of quality control data analyzed with site samples were used to assess the overall reliability of the data. The following qualifiers were used to identify data quality issues:

- U: Indicates the analyte was not detected in the sample above the sample reporting limit.
- J: Indicates the result was an estimated value; the associated numerical value was an approximate concentration of the analyte in the sample.
- UJ: Indicates the analyte was not detected above the reporting limit and the reporting limit was approximate.
- R: The sample result was rejected due to serious deficiencies; the presence or absence of the analyte could not be confirmed.
- RA: The sample result was rejected but is still considered usable.

Sample Information

The samples listed below were collected by AECOM on April 12, 2014 and April 14, 2014 as part of the PPG Garfield Avenue Supplemental Remedial Investigation (GARIS) Forrest Street Soil sampling at the PPG Forrest Street, Jersey City, NJ. Only the samples and parameters listed below were validated.

Field ID	Laboratory ID	Matrix	Fraction
FSI3-0.5-1.0	JB64643-1	Soil	Hexavalent Chromium
FSI3-0.5-1.0	JB64643-1A	Soil	Metals
FSI3-1.0-1.5	JB64643-2	Soil	Hexavalent Chromium
FSI3-1.0-1.5	JB64643-2A	Soil	Metals
FSI3-1.5-2.0	JB64643-3	Soil	Hexavalent Chromium
FSI3-1.5-2.0	JB64643-3A	Soil	Metals
FSI3-1.5-2.0X (Field Duplicate of FSI3-1.5-2.0)	JB64643-4	Soil	Hexavalent Chromium
FSI3-1.5-2.0X (Field Duplicate of FSI3-1.5-2.0)	JB64643-4A	Soil	Metals
FSI3-3.5-4.0	JB64643-5	Soil	Hexavalent Chromium
FSI3-3.5-4.0	JB64643-5A	Soil	Metals
FSI3-5.5-6.0	JB64643-6	Soil	Hexavalent Chromium
FSI3-5.5-6.0	JB64643-6A	Soil	Metals
FSI3-7.5-8.0	JB64643-7	Soil	Hexavalent Chromium
FSI3-7.5-8.0	JB64643-7A	Soil	Metals
FSI3-8.0-8.5	JB64643-8	Soil	Hexavalent Chromium
FSI3-8.0-8.5	JB64643-8A	Soil	Metals
FSI3-FB20140414 (Equipment Blank)	JB64643-9	Aqueous	Hexavalent Chromium
FSI3-FB20140414 (Equipment Blank)	JB64643-9A	Aqueous	Metals

The samples were collected following the procedures detailed in the Remedial Investigation Work Plan - Soil for Non-Residential Chromate Chemical Production Waste Sites 114, 132, 133, 135, 137, 143, and 186, Jersey City, New Jersey, or applicable proposal or work plan, and the Field Sampling Plan/Quality Assurance Project Plan for Non-Residential and Residential Chromium Sites Hudson County, New Jersey (December 2011).

General Comments

The data package was complete. Quality control (QC) issues identified during validation are discussed below. Refer to the Target Analyte Summary Hit(s) in Attachment A for a listing of all detected results, qualified results, and associated qualifications, where applicable. The nonconformances for each section discussed below are presented in Attachment B.

Hexavalent Chromium

Laboratory Blanks/Equipment Blanks

Method Blank

The method blank associated with the equipment blank FSI3-FB20140414 in this data set contained hexavalent chromium at a concentration above the method detection limit (MDL), but below the reporting limit (RL). Hexavalent chromium was detected in FSI3-FB20140414 at a concentration less than three times the method blank concentration; therefore, the hexavalent chromium result in this equipment blank was negated (U) at the reported value due to potential blank contamination or instrument analytical drift.

Negative drift for hexavalent chromium was detected in the continuing calibration blanks (CCBs) and the method blank, at comparable amounts, impacting the soil samples in this SDG. The positive hexavalent chromium result for the soil samples were qualified as estimated (J).

MS Results

Sample FSI37.5-8.0 [JB64643-7] was selected for the matrix spike (MS) analysis associated with the soil samples in this SDG and was used for supporting data quality recommendations. The soluble and insoluble MS recoveries were 85.2% and 97.4%, respectively; which met the quality control (QC) criteria of 75-125%. The post digestion spike (PDS) recovery was 87.9%, which met the PDS criteria of 85-115%. No data qualification was required on the basis of spike recoveries.

Sample Results

Reported results (flagged B by the laboratory) that were less than the RL, but greater than or equal to the MDL, are approximate values and have been qualified as estimated (J).

Metals

Laboratory Blanks/Equipment Blanks

Method Blank

Chromium, nickel, and vanadium were detected in the method blank (MP78971-MB1) associated with soil sample FSI3-7.5-8.0 in this SDG, at concentrations above the MDLs, but below the RLs. Since the results for nickel and vanadium in the associated soil sample were greater than ten times the amount detected in the method blank, no qualifications were required. The positive result for chromium in sample FSI3-7.5-8.0 was qualified as estimated (J) since the concentration detected in the sample was greater than three times but less than ten times the amount detected in the method blank.

Equipment Blank

Chromium and nickel were detected in the equipment blank (FSI3-FB20140414) associated with the soil samples in this SDG, at concentrations above the MDLs, but below the RLs. Since the associated soil sample results were greater than ten times the amount detected in the equipment blank, no qualifications were required.

MS Results

MS/MSD analyses were performed on FSI3-7.5-8.0 [JB64643-7A] in association with the Method 6010 analysis of the soil samples in this SDG.

The recoveries of antimony did not meet the QC criteria of 75-125%. The positive and nondetect results for antimony in the associated soil samples were qualified as estimated (J/UJ) with a potential low bias.

Field Duplicate Results

The field duplicate samples in this SDG were FSI3-1.5-2.0 and FSI3-1.5-2.0X.

The relative percent difference (RPD) for the reported vanadium field duplicate results exceeded the QC acceptance RPD of <35%; therefore, the reported vanadium results in all the soil samples in this SDG were qualified as estimated (J).

Sample Results

Reported results (flagged B by the laboratory) that were less than the RL, but greater than or equal to the MDL are approximate values that have been qualified as estimated (J).

Data Quality and Usability

In general, these data appear to be valid and may be used for decision-making purposes. No data were rejected. Qualified results, if applicable, are presented in Attachments A and B.

The negated hexavalent chromium result in the equipment blank FSI3-FB20140414 is usable as a nondetect result.

The hexavalent chromium results in all soil samples are usable as estimated values with potential low bias due to negative instrument drift.

The result for chromium in sample FSI3-7.5-8.0 is usable as an estimated value that may be biased high based on method blank contamination.

Sample results for antimony qualified due to low MS recoveries are usable as estimated values with the potential for low bias.

Sample results for vanadium qualified due to field duplicate imprecision are usable as estimated values with an unknown directional bias.

Sample results reported between the MDL and RL are usable as estimated values with an unknown directional bias.

ATTACHMENTS

Attachment A: Target Analyte Summary Hitlist(s)

Attachment B: Data Validation Report Form

Attachment A

Target Analyte Summary Hitlist(s)

Soil Target Analyte Summary Hit List (Hexavalent Chromium)

Site Name PPG Garfield Avenue Supplemental Remedial Investigation (GARIS) Forrest Street
Sampling Date April 12, 2014 and April 14, 2014
Lab Name/ID Accutest, Dayton, NJ
SDG No JB64643
Sample Matrix Soil
Trip Blank ID NA
Field Blank ID FSI3-FB20140414

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
FSI3-0.5-1.0	JB64643-1	CHROMIUM (HEXAVALENT)	-0.074	1.2	1.2	0.48	Qualify	43
FSI3-1.0-1.5	JB64643-2	CHROMIUM (HEXAVALENT)	-0.074	0.78	0.78	0.48	Qualify	43
FSI3-1.5-2.0	JB64643-3	CHROMIUM (HEXAVALENT)	-0.074	0.58	0.58	0.48	Qualify	43
FSI3-1.5-2.0X	JB64643-4	CHROMIUM (HEXAVALENT)	-0.074	0.60	0.60	0.47	Qualify	43
FSI3-3.5-4.0	JB64643-5	CHROMIUM (HEXAVALENT)	-0.074	0.90	0.90	0.50	Qualify	43
FSI3-5.5-6.0	JB64643-6	CHROMIUM (HEXAVALENT)	-0.074	0.39B	0.39	0.52	Qualify	31,43
FSI3-7.5-8.0	JB64643-7	CHROMIUM (HEXAVALENT)	-0.074	0.47B	0.47	0.49	Qualify	31,43
FSI3-8.0-8.5	JB64643-8	CHROMIUM (HEXAVALENT)	-0.074	0.13B	0.13	0.48	Qualify	31,43

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

NJDEP Laboratory Footnote

1. The value reported is less than or equal to 3x the value in the preparation/reagent blank. It is the policy of NJDEP-DPFSR to negate the reported value due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.

2. The value reported is greater than three (3) times but less than ten (10) times the value in the preparation/reagent blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to the preparation/reagent blank contamination. The "B" qualifier alerts the end-user to the presence of this analyte in the preparation/reagent blank.

3. The value reported is less than or equal to three (3) times the value in the trip/field blank. It is the policy of NJDEP-DPF SR to negate the reported value as due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
4. The value reported is greater than three (3) times but less than ten (10) times the value in the trip/field blanks and is considered "real". However, the reported value must be quantitatively qualified "J" due to trip/field blank contamination.
5. The concentration reported by the laboratory is incorrectly calculated.
6. The laboratory failed to report the presence of the analyte in the sample.
7. The reported Hexavalent Chromium value was qualified because the Calibration Check Standard was not within the recovery range (90-110 percent).
8. In the Duplicate Sample Analysis, Hexavalent Chromium fell outside the control limits of ≤ 20 percent for sample results $> 4xRL$ or $+ RL$ for sample results $< 4xRL$. Therefore, the result was qualified.
9. This analyte was rejected because the laboratory performed the Duplicate Analysis on a field blank.
10. The reported value was qualified because the PVS recovery was greater than 115 percent.
11. The reported value was qualified because the PVS recovery was less than 85 percent.
12. The non-detected value was qualified (UJ) because the PVS recovery was less than 85 percent. The possibility of a false negative exists.
13. The reported analyte was qualified because the associated Calibration Blank result was greater than the MDL.
14. The laboratory made a transcription error. No hits were found in the raw data.
15. This analyte is qualified or rejected because the laboratory exceeded the holding time for digestion and/or analysis.
16. The laboratory subtracted the preparation/reagent blank from the sample result. The Reviewer's calculation puts the preparation/reagent blank back into the result.
17. The photocopy is unreadable. Therefore, the QA reviewer cannot read the laboratory's reported concentration result.

18. The reported value was qualified because the predigestion spike recovery was less than 75 %, but greater than 50%.
19. The reported value was qualified because the predigestion spike recovery was greater than 125 percent.
20. The non-detected value was qualified (UJ) because the redigestion spike recovery was less than 75 percent. The possibility of a false negative exists.
21. The reported result was qualified or rejected because the laboratory did not record the pH value(s) of the sample in a laboratory notebook.
22. The reported value was qualified (J/UJ) because the sample moisture content exceeded 50 percent.
23. The sample result was rejected because the soluble and insoluble matrix spike recoveries were less than 50%.
24. The detected sample result was qualified (J) because the incorrect spike concentration was used.
25. The reported sample results were rejected because the predigestion spike recovery was greater than 150 percent.
26. The reported sample results were rejected because the redigestion spike recovery was greater than 150 percent.
27. The reported value was qualified (J) because the redigestion spike recovery was less than 75 percent.
28. The reported value was qualified (J/UJ) because the sample digestion temperature was less than 90C.
29. In the Field Duplicate Sample Analysis, Hexavalent Chromium fell outside the control limits of $\leq 20\%$ for sample results $> 4xRL$ or $+ RL$ for sample results $< 4xRL$. Therefore, the result was qualified.
30. The reported value was qualified as estimated (J/UJ) but the bias is uncertain due to both high and low MS recoveries.
31. The reported result was greater than the MDL but less than the RL and qualified (J) as estimated by the laboratory.
32. The reported value was qualified because the sample replicate precision criterion of $\leq 20\%$ for method 7199 was exceeded.
33. The reported value was qualified (J/UJ) because the laboratory control sample (LCS) recovery was less than 80%.

34. The reported value was qualified (J) because the laboratory control sample (LCS) recovery was greater than 120%.
35. The reported result was qualified because the matrix spike analysis was not performed at the proper frequency.
36. The reported result was qualified because the laboratory duplicate analysis was not performed at the proper frequency.
37. The result was qualified because the cooler temperature upon sample receipt exceeded 6C.
38. The reported value was qualified because the redigestion spike recovery was greater than 125 percent.
39. The reported result was rejected because the laboratory failed to perform the reanalysis due to insufficient sample volume.
40. The reported results was qualified because the laboratory failed to analyze an ending CCB.
41. The reported result was qualified because the laboratory failed to make the proper method specific pH adjustment.
42. The reported result was rejected because the laboratory failed to reanalyze the MS and associated sample(s) due to failed MS recoveries.
43. The result was qualified due to negative instrument drift.

Aqueous Target Analyte Summary Hit List (Hexavalent Chromium)

Site Name PPG Garfield Avenue Supplemental Remedial Investigation (GARIS) Forrest Street
Sampling Date April 12, 2014 and April 14, 2014
Lab Name/ID Accutest, Dayton, NJ
SDG No JB64643
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID NA

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/L)	Laboratory Sample Result (mg/L)	Validation Sample Result (mg/L)	RL (mg/L)	Quality Assurance Decision	NJDEP Validation Footnote
FSI3-FB20140414	JB64643-9	CHROMIUM (HEXAVALENT)	0.0015	0.0015B	0.0015	0.010	Negate	1

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

NJDEP Laboratory Footnote

- The value reported is less than or equal to 3x the value in the preparation/reagent blank. It is the policy of NJDEP-DPFSR to negate the reported value due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
- The value reported is greater than three (3) times but less than ten (10) times the value in the preparation/reagent blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to the preparation/reagent blank contamination. The "B" qualifier alerts the end-user to the presence of this analyte in the preparation/reagent blank.
- The value reported is less than or equal to three (3) times the value in the trip/field blank. It is the policy of NJDEP-DPFSR to negate the reported value as due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
- The value reported is greater than three (3) times but less than ten (10) times the value in the trip/field blanks and is considered "real". However, the reported value must be quantitatively qualified "J" due to trip/field blank contamination.
- The concentration reported by the laboratory is incorrectly calculated.

6. The laboratory failed to report the presence of the analyte in the sample.
7. The reported Hexavalent Chromium value was qualified because the Calibration Check Standard was not within the recovery range (90-110 percent).
8. In the Duplicate Sample Analysis, Hexavalent Chromium fell outside the control limits of ≤ 20 percent for sample results $> 4xRL$ or $+ RL$ for sample results $< 4xRL$. Therefore, the result was qualified.
9. This analyte was rejected because the laboratory performed the Duplicate Analysis on a field blank.
10. The reported value was qualified because the PVS recovery was greater than 115 percent.
11. The reported value was qualified because the PVS recovery was less than 85 percent.
12. The non-detected value was qualified (UJ) because the PVS recovery was less than 85 percent. The possibility of a false negative exists.
13. The reported analyte was qualified because the associated Calibration Blank result was greater than the MDL.
14. The laboratory made a transcription error. No hits were found in the raw data.
15. This analyte is qualified or rejected because the laboratory exceeded the holding time for digestion and/or analysis.
16. The laboratory subtracted the preparation/reagent blank from the sample result. The Reviewer's calculation puts the preparation/reagent blank back into the result.
17. The photocopy is unreadable. Therefore, the QA reviewer cannot read the laboratory's reported concentration result.
18. The reported value was qualified because the predigestion spike recovery was less than 75 %, but greater than 50%.
19. The reported value was qualified because the predigestion spike recovery was greater than 125 percent.
20. The non-detected value was qualified (UJ) because the redigestion spike recovery was less than 75 percent. The possibility of a false negative exists.
21. The reported result was qualified or rejected because the laboratory did not record the pH value(s) of the sample in a laboratory notebook.

22. The reported value was qualified (J/UJ) because the sample moisture content exceeded 50 percent.
23. The sample result was rejected because the soluble and insoluble matrix spike recoveries were less than 50%.
24. The detected sample result was qualified (J) because the incorrect spike concentration was used.
25. The reported sample results were rejected because the predigestion spike recovery was greater than 150 percent.
26. The reported sample results were rejected because the redigestion spike recovery was greater than 150 percent.
27. The reported value was qualified (J) because the redigestion spike recovery was less than 75 percent.
28. The reported value was qualified (J/UJ) because the sample digestion temperature was less than 90C.
29. In the Field Duplicate Sample Analysis, Hexavalent Chromium fell outside the control limits of $\leq 20\%$ for sample results $> 4xRL$ or $+ RL$ for sample results $< 4xRL$. Therefore, the result was qualified.
30. The reported value was qualified as estimated (J/UJ) but the bias is uncertain due to both high and low MS recoveries.
31. The reported result was greater than the MDL but less than the RL and qualified (J) as estimated by the laboratory.
32. The reported value was qualified because the sample replicate precision criterion of $\leq 20\%$ for method 7199 was exceeded.
33. The reported value was qualified (J/UJ) because the laboratory control sample (LCS) recovery was less than 80%.
34. The reported value was qualified (J) because the laboratory control sample (LCS) recovery was greater than 120%.
35. The reported result was qualified because the matrix spike analysis was not performed at the proper frequency.
36. The reported result was qualified because the laboratory duplicate analysis was not performed at the proper frequency.
37. The result was qualified because the cooler temperature upon sample receipt exceeded 6C.
38. The reported value was qualified because the redigestion spike recovery was greater than 125 percent.

39. The reported result was rejected because the laboratory failed to perform the reanalysis due to insufficient sample volume.
40. The reported results was qualified because the laboratory failed to analyze an ending CCB.
41. The reported result was qualified because the laboratory failed to make the proper method specific pH adjustment.
42. The reported result was rejected because the laboratory failed to reanalyze the MS and associated sample(s) due to failed MS recoveries.
43. The result was qualified due to negative instrument drift.

Soil Target Analyte Summary Hit List (Metals)

Site Name PPG Garfield Avenue Supplemental Remedial Investigation (GARIS) Forrest Street
Sampling Date April 12, 2014 and April 14, 2014
Lab Name/ID Accutest, Dayton, NJ
SDG No JB64643A
Sample Matrix Soil
Trip Blank ID NA
Field Blank ID FSI3-FB20140414

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
FSI3-0.5-1.0	JB64643-1A	ANTIMONY	U	0.78B	0.78	2.4	Qualify	15,23
FSI3-0.5-1.0	JB64643-1A	CHROMIUM	U	18.3	18.3	1.2		
FSI3-0.5-1.0	JB64643-1A	NICKEL	U	15.7	15.7	4.9		
FSI3-0.5-1.0	JB64643-1A	VANADIUM	U	20.6	20.6	6.1	Qualify	19
FSI3-1.0-1.5	JB64643-2A	ANTIMONY	U	0.97B	0.97	2.4	Qualify	15,23
FSI3-1.0-1.5	JB64643-2A	CHROMIUM	U	12.6	12.6	1.2		
FSI3-1.0-1.5	JB64643-2A	NICKEL	U	18.0	18.0	4.7		
FSI3-1.0-1.5	JB64643-2A	VANADIUM	U	17.4	17.4	5.9	Qualify	19
FSI3-1.5-2.0	JB64643-3A	ANTIMONY	U	1.1B	1.1	2.3	Qualify	15,23
FSI3-1.5-2.0	JB64643-3A	CHROMIUM	U	21.4	21.4	1.2		
FSI3-1.5-2.0	JB64643-3A	NICKEL	U	16.7	16.7	4.6		
FSI3-1.5-2.0	JB64643-3A	VANADIUM	U	29.5	29.5	5.8	Qualify	19
FSI3-1.5-2.0X	JB64643-4A	ANTIMONY	U	1.7B	1.7	2.4	Qualify	15,23
FSI3-1.5-2.0X	JB64643-4A	CHROMIUM	U	15.6	15.6	1.2		
FSI3-1.5-2.0X	JB64643-4A	NICKEL	U	13.6	13.6	4.8		
FSI3-1.5-2.0X	JB64643-4A	VANADIUM	U	20.6	20.6	6.0	Qualify	19
FSI3-3.5-4.0	JB64643-5A	ANTIMONY	U	1.2B	1.2	2.6	Qualify	15,23
FSI3-3.5-4.0	JB64643-5A	CHROMIUM	U	14.6	14.6	1.3		

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
FSI3-3.5-4.0	JB64643-5A	NICKEL	U	14.7	14.7	5.3		
FSI3-3.5-4.0	JB64643-5A	VANADIUM	U	20.4	20.4	6.6	Qualify	19
FSI3-5.5-6.0	JB64643-6A	ANTIMONY	U	0.87B	0.87	2.7	Qualify	15,23
FSI3-5.5-6.0	JB64643-6A	CHROMIUM	U	14.8	14.8	1.4		
FSI3-5.5-6.0	JB64643-6A	NICKEL	U	17.0	17.0	5.4		
FSI3-5.5-6.0	JB64643-6A	VANADIUM	U	20.4	20.4	6.8	Qualify	19
FSI3-7.5-8.0	JB64643-7A	ANTIMONY	U	U	U	2.0	Qualify	15
FSI3-7.5-8.0	JB64643-7A	NICKEL	0.15	10	10	3.9		
FSI3-7.5-8.0	JB64643-7A	VANADIUM	0.12	23.9	23.9	4.9	Qualify	19
FSI3-7.5-8.0	JB64643-7A	CHROMIUM	6.0	16.7	16.7	1.2	Qualify	2
FSI3-8.0-8.5	JB64643-8A	ANTIMONY	U	0.87B	0.87	2.4	Qualify	15,23
FSI3-8.0-8.5	JB64643-8A	CHROMIUM	U	17.2	17.2	1.2		
FSI3-8.0-8.5	JB64643-8A	NICKEL	U	11.1	11.1	4.7		
FSI3-8.0-8.5	JB64643-8A	VANADIUM	U	29.4	29.4	5.9	Qualify	19

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

NJDEP Laboratory Footnote

1. The value reported is less than or equal to 3x the value in the method blank. It is the policy of NJDEP-DPFSR to negate the reported value due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
2. The value reported is greater than three (3) but less than ten (10) times the value in the method blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to the method blank contamination. The "B" qualifier alerts the end-user to the presence of this analyte in the method blank.

3. The value reported is less than or equal to 3x the value in the trip/field blank. It is the policy of NJDEP-DPFSR to negate the reported value as due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
4. The value reported is greater than 3x but less than ten (10) the value in the trip/field blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to trip/field blank contamination.
5. The concentration reported by the laboratory is incorrectly calculated.
6. The laboratory failed to report the presence of the analyte in the sample.
7. The reported metal value was qualified because the Calibration Verification Standard was not within the recovery range (90-110 percent).
8. In the MS/MSD Sample Analysis, this analyte fell outside the control limits of 20% RPD. Therefore, the result was qualified.
9. This analyte was qualified because the laboratory performed the MS/MSD Analysis on a field blank.
10. The reported analyte was qualified because the associated Calibration Blank result was greater than the MDL.
11. The reported value was qualified because serial dilution analysis was not within QC limit of 10% D.
12. This analyte is rejected because the laboratory exceeded the holding time for digestion and analysis.
13. The laboratory subtracted the method blank from the sample result. The reviewer's calculation has added the method blank result to the reported concentration.
14. The photocopy submitted is illegible. Therefore, the QA reviewer cannot read the laboratory's reported concentration result.
15. The reported or nondetected value was qualified because the MS/MSD spike recovery was less than 75 percent.
16. The reported value was qualified because the MS/MSD spike recovery was greater than 125 percent.
17. The reported value was qualified as estimated (J/UJ) but the bias is uncertain due to both high and low MS recoveries.
18. The reported values were qualified because the laboratory duplicate exceeded 35 percent RPD for results greater than 5X the reporting limit or the absolute difference exceeded two times the reporting limit for sample result less than 5 times the reporting limit.

19. The reported value was qualified because the field duplicate exceeded 35 percent RPD for results greater than 5X the reporting limit or the absolute difference exceeded two times the reporting limit for sample result less than 5 times the reporting limit.
20. The reported value was qualified because the LCS recovery was less than 80 percent.
21. The reported value was qualified because the sample moisture content was greater than 50 percent.
22. The reported value was rejected because the field duplicate absolute difference was greater than 4 times the RL or the RPD was greater than 120%.
23. The reported result was greater than the MDL but less than the RL and qualified (J) as estimated by the laboratory.
24. The field duplicate absolute difference exceeded two times the reporting limit for sample result less than 5 times the reporting limit.
25. The reported value was qualified because the LCS recovery was greater than 120 percent.

Aqueous Target Analyte Summary Hit List (Metals)

Site Name PPG Garfield Avenue Supplemental Remedial Investigation (GARIS) Forrest Street
Sampling Date April 12, 2014 and April 14, 2014
Lab Name/ID Accutest, Dayton, NJ
SDG No JB64643A
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID NA

Field Sample ID	Lab Sample ID	Analyte	Method Blank (ug/L)	Laboratory Sample Result (ug/L)	Validation Sample Result (ug/L)	RL (ug/L)	Quality Assurance Decision	NJDEP Validation Footnote
FSI3-FB20140414	JB64643-9A	NICKEL	U	1.1B	1.1	10	Qualify	23
FSI3-FB20140414	JB64643-9A	CHROMIUM	U	5.0B	5.0	10	Qualify	23

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

NJDEP Laboratory Footnote

1. The value reported is less than or equal to 3x the value in the method blank. It is the policy of NJDEP-DPFSR to negate the reported value due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
2. The value reported is greater than three (3) but less than ten (10) times the value in the method blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to the method blank contamination. The "B" qualifier alerts the end-user to the presence of this analyte in the method blank.
3. The value reported is less than or equal to 3x the value in the trip/field blank. It is the policy of NJDEP-DPFSR to negate the reported value as due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
4. The value reported is greater than 3x but less than ten (10) the value in the trip/field blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to trip/field blank contamination.
5. The concentration reported by the laboratory is incorrectly calculated.

6. The laboratory failed to report the presence of the analyte in the sample.
7. The reported metal value was qualified because the Calibration Verification Standard was not within the recovery range (90-110 percent).
8. In the MS/MSD Sample Analysis, this analyte fell outside the control limits of 20% RPD. Therefore, the result was qualified.
9. This analyte was qualified because the laboratory performed the MS/MSD Analysis on a field blank.
10. The reported analyte was qualified because the associated Calibration Blank result was greater than the MDL.
11. The reported value was qualified because serial dilution analysis was not within QC limit of 10% D.
12. This analyte is rejected because the laboratory exceeded the holding time for digestion and analysis.
13. The laboratory subtracted the method blank from the sample result. The reviewer's calculation has added the method blank result to the reported concentration.
14. The photocopy submitted is illegible. Therefore, the QA reviewer cannot read the laboratory's reported concentration result.
15. The reported or nondetected value was qualified because the MS/MSD spike recovery was less than 75 percent.
16. The reported value was qualified because the MS/MSD spike recovery was greater than 125 percent.
17. The reported value was qualified as estimated (J/UJ) but the bias is uncertain due to both high and low MS recoveries.
18. The reported values were qualified because the laboratory duplicate exceeded 35 percent RPD for results greater than 5X the reporting limit or the absolute difference exceeded two times the reporting limit for sample result less than 5 times the reporting limit.
19. The reported value was qualified because the field duplicate exceeded 35 percent RPD for results greater than 5X the reporting limit or the absolute difference exceeded two times the reporting limit for sample result less than 5 times the reporting limit.
20. The reported value was qualified because the LCS recovery was less than 80 percent.
21. The reported value was qualified because the sample moisture content was greater than 50 percent.

22. The reported value was rejected because the field duplicate absolute difference was greater than 4 times the RL or the RPD was greater than 120%.
23. The reported result was greater than the MDL but less than the RL and qualified (J) as estimated by the laboratory.
24. The field duplicate absolute difference exceeded two times the reporting limit for sample result less than 5 times the reporting limit.
25. The reported value was qualified because the LCS recovery was greater than 120 percent.

Attachment B

Data Validation Report Form

Client Name: PPG Industries	Project Number: 60154801.6001A
Site Location: PPG Garfield Avenue Supplemental Remedial Investigation (GARIS) Forrest Street Soil, Jersey City, NJ	Project Manager: William Spronz
Laboratory: Accutest, Dayton, NJ	Type of Validation: Full
Laboratory Job No: JB64643	Date Checked: 5/20/14
Validator: Paula DiMattei	Peer: Lisa Krowitz

ITEM	YES	NO	N/A	COMMENTS
Sample results included?	X			
Reporting Limits met project requirements?	X			
Field I.D. included?	X			
Laboratory I.D. included?	X			
Sample matrix included?	X			
Sample receipt temperature 2-6C?	X			
Signed COCs included?	X			
Date of sample collection included?	X			
Date of sample digestion included?	X			
Holding time to digestion met criteria? (Soils -30 days from collection to digestion.)	X			
Date of analysis included?	X			
Holding time to analysis met criteria? (Soils -168 hours from digestion to analysis; Aqueous - 24 hours from collection to analysis.)	X			
Method reference included?	X			
Laboratory Case Narrative included?	X			

Definitions: MDL Method Detection Limit; %R Percent Recovery; RL Reporting Limit; RPD Relative Percent Difference; RSD Relative Standard Deviation :Corr Correlation Coefficient.

ITEM	YES	NO	N/A	COMMENTS
Initial calibration documentation included in lab package?	X			
1) Blank plus 4 standards (7196A) or blank plus 3 standards (7199)	X			
2) Correlation coefficient of =0.995 (7196A) or =0.999 (7199)	X			
3) Calibrate daily or each time instrument is set up.	X			
Calibration Check Standard (CCS) for 7196A and Quality Control Sample (QCS) for 7199 Included in Lab Package?	X			
1) %R criteria met? (90 - 110%)	X			
2) Correct frequency of one per every 10 samples	X			
3) CCS and QCS from independent source and at mid-level of calibration curve	X			
Calibration Blanks	X			
1) Analyzed prior to initial calibration standards and after each CCS/QCS?	X			
2) Absolute value should not exceed MDL.		X		See nonconformance table below
Method Blank, Field Blanks and/or Equipment Blanks Included in Lab Package?	X			FSI3-FB20140414
1) Method blank analyzed with each preparation batch?	X			
2) Absolute value should not exceed MDL.		X		See nonconformance table below
Eh and pH Data	X			
1) Eh and pH data was included and plotted for all samples?	X			
Soluble Matrix Spike Data Included in Lab Package?	X			Soil: FSI3-7.5-8.0
1) Soluble Matrix %R criteria met? (75-125%R).	X			
2) Was the spike concentration 40 mg/Kg or twice the sample concentration?	X			
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	X			
Insoluble Matrix Spike Data Included in Lab Package?	X			
1) Insoluble Matrix %R criteria met? (75-125%R).	X			
2) Was the spike concentration around 400 to 800 mg/Kg?	X			
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	X			

ITEM	YES	NO	N/A	COMMENTS
Post Digestion Spike	X			
1) Post Digestion Spike %R criteria met? (85-115%R).	X			
2) Was the spike concentration 40 mg/Kg or twice the sample concentration?	X			
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	X			
Sample Duplicate Data Included in Lab Package?	X			Soil: FSI3-7.5-8.0
1) RPD criteria met? (RPD ≤20%) if both results are ≤4x RL or absolute difference ≤RL if either or both results are <4xRL.	X			
2) Was a sample duplicate analyzed at the frequency of 1 per batch or 20 samples?	X			
Was a Laboratory Control Sample (LCS) Included in Lab Package?	X			
1) %R criteria met? (80-120%R).	X			
2) Was an LCS analyzed at the frequency of 1/batch or 20 samples?	X			
Were any Field Duplicate samples submitted with this SDG?	X			FSI3-1.5-2.0 and FSI3-1.5-2.0X
1) Were Field duplicate RPD criteria met? (RPD≤20% for both sample results >4xRL or absolute difference ≤ RL if either or both results are <4xRL.	X			
Were all sample quantitation and reporting requirements met?	X			
1) Were all solid samples reported with percent solids > 50% ?	X			
2) Were any samples analyzed or reported with dilutions?		X		
Miscellaneous Items	X			
1) For soils by 7196A, was the pH within a range of 7.0-8.0?	X			
2) For soils by 7199, was the pH within a range of 9.0-9.5?			X	
3) For aqueous by 7196A, was the pH with a range of 1.5-2.5?	X			
4) For soils (3060A), was the digestion temperature 90-95C for at least 60 minutes?	X			
5) For 7199, was each sample injected twice and was the RPD =20?			X	

Laboratory Blanks

Blank ID	Analyte	Result	QL	Units	Associated Samples
GN3073-MB1	CHROMIUM (HEXAVALENT)	0.0015	0.01	mg/L	FSi3-FB20140414
GP79446-MB1	CHROMIUM (HEXAVALENT)	-0.074	0.40	mg/kg	All soil samples

SDG#: JB64326
Batch: GN3139
 Cr+6 ICAL 04/15/14
 Soil
 (p. 50 of data pkg)

x - concentration	y - response
0	0
0.01	0.009
0.05	0.044
0.1	0.091
0.3	0.267
0.5	0.443
0.8	0.688
1	0.89

(p. 50 of data pkg)

AECOM Calculated Intercept	0.0008	OK	Reported intercept	0.0008
AECOM Slope	0.8788	OK	Reported Slope	0.8788
AECOM Calculated r	0.99976	OK	Reported r	0.99976

GP79356-B1
p.50

LCS calculation
 Background Absorbance 0
 Total absorbance 0.859
 Total absorbance - background 0.859
 Instrument Concentration 0.977
 Sample weight (mg/kg) 0.0025
 Final Volume (L) 0.1
 Dilution Factor 1

AECOM Calculated LCS Result (mg/Kg)	39.1	OK	Reported Result (mg/Kg)	39.1
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%R = Found/True*100 **p.30**

True Value (mg/kg) 40

AECOM Calculated %R	97.7	OK rounding	Reported %R	97.8
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MS calculation **JB64326-8 [FS18-3.5-4.0]p.50**

Background reading 0
 Total absorbance 0.3
 Total absorbance - background 0.3
 Instrument Concentration 0.3404
 Sample weight (mg/kg) 0.00255
 Final Volume (L) 0.1
 Percent solids 0.76
 Dilution Factor 50

AECOM Calculated MS Result (mg/Kg)	878	OK	Reported Result (mg/Kg)	878
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%R = Found/True*100 **JB64326-8 [FS18-3.5-4.0]p.32**

True Value (mg/kg) 1230

Native concentration (mg/Kg) 0.71

AECOM%R	71.4	OK	Reported %R	71.4
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Percent Solids **JB64326-8 [FS18-3.5-4.0]p.34**

Empty dish weight= 26.91

Wet weight= 34.70

Dry weight= 32.83

AECOM%solids =	76.0	OK	reported %solids=	76.0
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Reporting Limit**JB64326-8 [FS18-3.5-4.0]p.16**

Low Standard	0.01		
Initial weight (mg/kg)	0.0025		
Final volume (L)	0.1		
Percent solids	0.76		
Dilution Factor	1		
Reporting Limit	0.53	OK	Reported RL (mg/Kg)= 0.53

Sample Calculations**JB64326-8 [FS18-3.5-4.0]p.16, 50**

Background reading	0.015		
Total absorbance	0.028		
Total absorbance - background	0.013		
Instrument Response	0.014		
Sample weight (mg/kg)	0.00258		
Final Volume (L)	0.1		
Percent solids	0.76		
Dilution Factor	1		
AECOM Calculated Result (mg/Kg)	0.71	OK	Reported Result (mg/Kg) 0.71

Client Name: PPG Industries	Project Number: 60154801.6001A
Site Location: PPG Garfield Avenue Supplemental Remedial Investigation (GARIS) Forrest Street Soils, Jersey City, NJ	Project Manager: William Spronz
Laboratory: Accutest, Dayton, NJ	Type of Validation: Limited
Laboratory Job No: JB64643A	Date Checked: 5/20/14
Validator: Paula DiMattei	Peer: Lisa Krowitz

ITEM	YES	NO	N/A	COMMENTS
Sample results included?	X			
Reporting Limits met project requirements?	X			
Field I.D. included?	X			
Laboratory I.D. included?	X			
Sample matrix included?	X			
Sample receipt temperature 2-6C?	X			
Signed COCs included?	X			
Date of sample collection included?	X			
Date of sample digestion included?	X			
Date of analysis included?	X			
Holding time met QC criteria? (Metals -180 days from sample collection; Mercury - 28 days from sample collection. If HT exceeded by 10 days R all results.	X			
Method reference included?	X			
Laboratory Case Narrative included?	X			

Definitions: MDL Method Detection Limit; %R Percent Recovery; RL Reporting Limit; RPD Relative Percent Difference; RSD Relative Standard Deviation ;Corr Correlation Coefficient.

ITEM	YES	NO	N/A	COMMENTS
Sample dilutions?		X		
Initial calibration documentation included in lab package?			X	NA for a Limited review
1) Calibrate daily or each time instrument is set up.			X	
2) ICP (6010) -Blank plus 1 standard? If no, reject (R) data.			X	
3) Hg (7470/7471) -Blank plus 5 standards? If no, reject (R) data.			X	
Initial Calibration Verification Standard (ICV) for ICP (6010) and Initial Calibration Check Standard (ICCS) for Hg (7470/7471) included in lab package?			X	
1) Analyzed immediately after initial calibration? If no, reject (R) data.			X	
2) %R criteria met? (90-110%). If no, J positive results for affected analyte(s) if %R between 80-89% and 111-120% and indicate bias; UJ non-detect results for affected analyte(s) if %R between 80-89% , and R all data for affected analyte(s) if %R 120%.			X	
3) Spot check ICV/ICCS results for several analytes.			X	
Continuing Calibration Verification Standard (CCV) for ICP (6010) and Calibration Check Standard (CCS) for Hg (7470/7471) included in Lab Package?			X	
1) Analyzed immediately after each ICV/ICC/CB and after every 10 samples? If no, reject (R) data.			X	
2) CCS and CCV from independent source and at mid-level of calibration curve. If no, reject (R) data.			X	
3) %R criteria met? (90-110%R). If no, J positive results for affected analyte(s) if %R between 80-89% and 111-120% and indicate bias; UJ non-detect results for affected analyte(s) if %R between 80-89% and R all data for affected analyte(s) if %R 120%.			X	
4) Spot check CCV/CCS results for several analytes.			X	
Low Calibration Standard (CRI) included in Lab Package?			X	
1) %R criteria met? - 50-150% for Co, Mn, Zn, by ICP-MS; Pb, Ti by 6010; 70-130% all others. If no, refer to ILM05.4 NJ SOP 5.A.2 for actions.			X	

ITEM	YES	NO	N/A	COMMENTS
Calibration Blanks			X	
1) Analyzed after daily calibration and after each ICV/ICC/CCV/CCS and after every 10 samples? If no, reject (R) data.			X	
2) Absolute value 10xCB result, no qualification.			X	
Method Blank Included in Lab Package?	X			
1) Method blank analyzed with each preparation batch or every SDG, or 1/20 samples? If no, reject (R) data, except no aqueous MB required for FB/EB if only soil samples were analyzed.	X			
2) Method blank analyzed 1/20 samples? If - MB 1/25, J sample results from 21-25; -MB >1/25, R sample results after 25th sample.	X			
3) MB results nondetect? If no, -sample result 3xMB but 10xMB, no qualification.		X		See nonconformance table below.
4) Negative MB result reported? If yes, -Positive sample result		X		
Field Blanks/Equipment Blanks Included in Lab Package?	X			FSI3-FB20140414
1) FB/EB result non-detect? If no, -sample result 3xFB/EB but 10xFB/EB, no qualification.		X		
ICP Interference Check Sample (ICS) included in Lab Package?			X	NA for a Limited review
1) Analyzed at beginning of analytical run? If no, reject (R) data.			X	
2) %R criteria met? (80-120%) If no, %R>120%, no qualification if sample result non-detect; %R between 121-150%, J positive results, biased high; %R between 50-79%, J/UJ results, biased low; %R150%, reject (R) result			X	
3) Spot check accuracy of %Rs			X	
Matrix Spike/Matrix Spike Duplicate Data Included in Lab Package?	X			Soil: FSI3-7.5-8.0 and batch QC (Batch QC was not assessed)
1) MS/MSD %R (75-125%R) and RPD (+20%) criteria met? - %R>125% J positive results for affected analyte(s) for all samples in the same batch/SDG, accept NDs; -%R		X		See nonconformance table below.
2) Was a sample spiked at the frequency of 1/batch or 20 samples?	X			
3) Was the MS performed on a site sample?	X			
4) Was the MS performed on a FB/EB or TB? If yes, J all sample data.		X		

ITEM	YES	NO	N/A	COMMENTS
Post Digestion Spike			X	NA for a Limited review
1) %R criteria met? (75-125%R) - %R>125% J positive results for affected analyte(s) for all samples in the same batch/SDG, accept NDs.; - %R			X	
2) Was the spike performed on a FB/EB or TB? If yes, J all sample data.			X	
3) Was a sample spiked at the frequency of 1/batch or 20 samples?			X	
Laboratory Duplicate Data Included in Lab Package?		X		MS/MSD analysis was performed in lieu of a laboratory duplicate analysis.
Aqueous - If RPD is >20% but 5x the QL, estimate (J) results >the QL. - If RPD is >100%, reject R results >= the QL.- If sample and/or duplicate is the QL, estimate (J) positive results 2x the QL, reject R non-detects and positive results			X	
Soil - If RPD is >35% but 5x the QL, estimate (J) results > the QL. - If RPD is >120%, reject results > the QL. - If sample and/or duplicate is 2x the QL, estimate (J) positive results 4x the QL, reject nondetects and positive results			X	
Was a Laboratory Control Sample (LCS) Included in Lab Package?	X			
1) LCS %R criteria met? (80-120%R). If no, J/UJ all affected analytes(s) for all samples in the same batch/SDG.	X			
2) Was an LCS analyzed at the frequency of 1/batch or 20 samples? If no, J/UJ affected analyte(s) for all samples in the same batch/SDG.	X			
Serial Dilution			X	NA for a Limited review
1) %D(25xIDL (7000) or >10xIDL (6010) and %D >10% J positive results for affected analyte(s) for all samples in the same batch/SDG, accept NDs.			X	
2) Was the frequency 1/batch or 20 samples?			X	
3) Was a site sample used?			X	
4) Was a FB/EB or TB used? If yes, J all sample data.			X	
5) Spot check accuracy of %Ds.			X	

ITEM	YES	NO	N/A	COMMENTS
Field Duplicate Data included in Lab Package?	X			FSI3-1.5-2.0 and FSI3-1.5-2.0X
Aqueous - If RPD is >20% but 5x the QL, estimate (J) results > the QL. - If RPD is >100%, reject R results >= the QL. - If sample and/or duplicate is the QL, estimate (J) positive results 2x the QL, reject R non-detects and positive results			X	
Soil - If RPD is >35% but 5x the QL, estimate (J) results > the QL. - If RPD is >120%, reject results > the QL. - If sample and/or duplicate is 2x the QL, estimate (J) positive results 4x the QL, reject nondetects and positive results		X		See nonconformance table below
Percent Solids data included in Lab Package?	X			
1) %Solids criteria (Reg 2 criteria) met? (>=50%)	X			

Laboratory Blanks

Blank ID	Analyte	Result	QL	Units	Associated Samples
MP78971-MB1	Chromium	6.0	0.93	mg/kg	FSI3-7.5-8.0
	Nickel	0.15	3.7	mg/kg	
	Vanadium	0.12	4.7	mg/kg	

Field Blanks

Blank ID	Analyte	Result	QL	Units	Associated Samples
FSI3-FB20140414	CHROMIUM	5.0	10	ug/L	All soil samples
FSI3-FB20140414	NICKEL	1.1	10	ug/L	

Matrix Spikes

Sample ID	Analyte	MS % Recovery	MSD % Recovery	Lower Limit	Upper Limit
FSI3-7.5-8.0	ANTIMONY	49.1	46.8	75	125

Field Duplicates

Sample ID	Duplicate ID	Analyte	Sample Result	Qual	Duplicate Result	Qual	QL	Units	RPD
FSI3-1.5-2.0	FSI3-1.5-2.0X	Vanadium	29.5		20.6		5.8	mg/kg	35.5

Data Validation Report

Project:	PPG Garfield Avenue Supplemental Remedial Investigation (GARIS) 90 & 98 Forrest Street IRM	
Laboratory:	Accutest, Dayton, NJ	
Laboratory Job No.:	JB71607 and JB71607R	
Analysis/Method:	Hexavalent Chromium SW846 3060A/7196	
Validation Level:	Full	
Site Location/Address:	PPG 90 & 98 Forrest Street, Jersey City, NJ	
AECOM Project No:	60314348.GA.RA.IRM	
Prepared by:	Paula DiMattei /AECOM	Completed on: 07/22/2014
Reviewed by:	Lisa Krowitz /AECOM	File Name: JB71607_2014-07-22_DV Report-F

Introduction

The data were reviewed in accordance with the FSP-QAPP and the following NJDEP validation Standard Operating Procedure (SOP):

- NJDEP Office of Data Quality SOP 5.A.10, Rev 3 (September 2009), SOP for Analytical Data Validation of Hexavalent Chromium - for USEPA SW-846 Method 3060A, USEPA SW-846 Method 7196A and USEPA SW-846 Method 7199;

The results of quality control data analyzed with site samples were used to assess the overall reliability of the data. The following qualifiers were used to identify data quality issues:

- U: Indicates the analyte was not detected in the sample above the sample reporting limit.
- J: Indicates the result was an estimated value; the associated numerical value was an approximate concentration of the analyte in the sample.
- UJ: Indicates the analyte was not detected above the reporting limit and the reporting limit was approximate.
- R: The sample result was rejected due to serious deficiencies; the presence or absence of the analyte could not be confirmed.
- RA: The sample result was rejected but is still considered usable.

Sample Information

The samples listed below were collected by AECOM on July 14, 2014 as part of the PPG Garfield Avenue Supplemental Remedial Investigation (GARIS) - 90 & 98 Forrest Street IRM sampling at PPG 90 & 98 Forrest Street, Jersey City, NJ. Only the samples and parameters listed below were validated.

Field ID	Laboratory ID	Matrix	Fraction
114-90F-IRM-20140714	JB71607-1	Soil	Hexavalent Chromium
114-98F-IRM-20140714-E	JB71607-3	Soil	Hexavalent Chromium
114-98F-IRM-20140714-E	JB71607-3R	Soil	Hexavalent Chromium
114-98F-IRM-20140714-W	JB71607-2	Soil	Hexavalent Chromium
114-98F-IRM-20140714-W	JB71607-2R	Soil	Hexavalent Chromium
114-FB20140714 (Equipment Blank)	JB71607-4	Aqueous	Hexavalent Chromium

The samples were collected following the procedures detailed in the Field Sampling Plan/Quality Assurance Project Plan for Non-Residential and Residential Chromium Sites Hudson County, New Jersey (December 2011).

General Comments

The data package was complete. Quality control (QC) issues identified during validation are discussed below. Refer to the Target Analyte Summary Hit(s) in Attachment A for a listing of all detected results, qualified results, and associated qualifications, where applicable. The nonconformances for each section discussed below are presented in Attachment B.

Laboratory Blanks/Equipment Blanks

Method Blank

Negative drift for hexavalent chromium was detected in the continuing calibration blanks (CCBs) and the method blank, at comparable amounts, impacting the equipment blank 114-FB20140714 in this SDG. The nondetect hexavalent chromium result in the equipment blank was qualified as estimated (UJ).

MS Results

Sample 114-98F-IRM-20140714-E [JB71607-3] was selected for the soil matrix spike analysis and used for supporting data quality recommendations. The soluble and insoluble matrix spike (MS) recoveries from the initial batch were 74.5% and 96.5%, respectively. The soluble MS recovery did not meet quality control (QC) criteria of 75-125%R. The post digestion spike (PDS) recovery was 97.1% which met the PDS criteria of 85-115%.

Based on the slightly low soluble MS recovery, less than 75%R, the MS and associated samples, with one exception, were reanalyzed using Method 7196. The laboratory was unable to reanalyze sample 114-90F-IRM-20140714 because of insufficient sample quantity; consequently, the positive hexavalent chromium result in this sample was qualified as rejected (RA).

The soluble and insoluble matrix spike recoveries from the re-analysis were 48.4% and 95.2%, respectively. The soluble MS recovery did not meet the QC criteria of 75-125%R. The PDS for the re-analysis batch was recovered at 73.4% and the pH-adjusted PDS was recovered at 82.3% which did not meet the PDS criteria of 85-115%.

Since the soluble MS recoveries were outside the acceptable QC limit of 75-125%, additional parameters were analyzed to determine if possible matrix interferences could be the cause for the poor matrix spike recoveries. All the soil samples were tested for pH and oxidation reduction potential (ORP) and plotted on an Eh/pH phase diagram chart. From this chart, the source sample for the matrix spike analysis was plotted slightly above the phase change line, indicating slight oxidizing potential within the sample matrix, capable of supporting hexavalent chromium. Analyses for ferrous iron, sulfide screen, and total organic carbon (TOC) were performed on the MS source sample to confirm the oxidizing/reducing potential within the sample matrix. The sulfide screen was reported as nondetect, indicating no reducing agents within the sample matrix; however, the ferrous iron (0.25%) and the TOC results (7,040 mg/kg) were positive, indicating slight reducing potential within the sample matrix.

Since the MS recoveries from both the initial and reanalysis did not meet the MS QC requirements, but at least one MS recovery was greater than 50%, the highest detected hexavalent chromium result was reported for each soil sample. The reported hexavalent chromium results in all the soil samples in this SDG, except sample 114-90F-IRM-20140714 were qualified as estimated (J) due to the poor MS recoveries.

The hexavalent chromium result for sample 114-90F-IRM-20140714 was qualified as rejected (RA) since the sample was not reanalyzed due to poor MS recoveries in the initial analysis.

No further qualifications were taken as a result of the low PDS recoveries in the reanalysis batch since the PDS recovery met QC requirements in the initial analysis.

Laboratory Duplicate Precision

Sample 114-98F-IRM-20140714-E was selected by the laboratory to demonstrate laboratory precision capabilities.

The relative percent difference (RPD) for hexavalent chromium exceeded the QC acceptance RPD in the reanalysis. Results were not reported from the reanalysis; therefore, qualification of sample results was not required on the basis of laboratory duplicate imprecision.

Data Quality and Usability

In general, these data appear to be valid and may be used for decision-making purposes. The result for hexavalent chromium in one soil sample was rejected; however, the results may be usable for project objectives as discussed below. Qualified results, if applicable, are presented in Attachments A and B.

The hexavalent chromium result for sample 114-90F-IRM-20140714 was rejected since the laboratory was unable to reanalyze the sample due to insufficient sample quantity. The initial soluble MS recovery (74.5%) associated with this sample rounds to the lower QC acceptance limit of 75%. However, the laboratory took a conservative approach to re-analyze the samples in this SDG since the soluble MS %R may be interpreted to be slightly below the recovery criteria. The insoluble MS recovery and PDS recovery were within QC acceptance limits. Therefore, even though the sample result was rejected based on the lack of a reanalysis this result may be usable for site decisions as an estimated value with a potential for a low bias.

All remaining reported hexavalent chromium soil results in this SDG are usable as estimated values with the potential for a low bias due to low soluble MS recoveries.

The hexavalent chromium result in the equipment blank is usable as an estimated reporting limit due to negative instrument drift.

ATTACHMENTS

Attachment A: Target Analyte Summary Hitlist(s)

Attachment B: Data Validation Report Form

Attachment A

Target Analyte Summary Hitlist(s)

Soil Target Analyte Summary Hit List (Hexavalent Chromium)

Site Name PPG Garfield Avenue Supplemental Remedial Investigation (GARIS) 90 & 98 Forrest Street IRM
Sampling Date July 14, 2014
Lab Name/ID Accutest, Dayton, NJ
SDG No JB71607 and JB71607R
Sample Matrix Soil
Trip Blank ID NA
Field Blank ID 114-FB20140714

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
114-90F-IRM-20140714	JB71607-1	CHROMIUM (HEXAVALENT)	U	44.6	44.6	0.84	Reject	39
114-98F-IRM-20140714-E	JB71607-3	CHROMIUM (HEXAVALENT)	U	1.5	1.5	0.41	Qualify	18
114-98F-IRM-20140714-W	JB71607-2	CHROMIUM (HEXAVALENT)	U	1.2	1.2	0.41	Qualify	18

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

NJDEP Laboratory Footnote

1. The value reported is less than or equal to 3x the value in the preparation/reagent blank. It is the policy of NJDEP-DPFSR to negate the reported value due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
2. The value reported is greater than three (3) times but less than ten (10) times the value in the preparation/reagent blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to the preparation/reagent blank contamination. The "B" qualifier alerts the end-user to the presence of this analyte in the preparation/reagent blank.
3. The value reported is less than or equal to three (3) times the value in the trip/field blank. It is the policy of NJDEP-DPFSR to negate the reported value as due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
4. The value reported is greater than three (3) times but less than ten (10) times the value in the trip/field blanks and is considered "real". However, the reported value must be quantitatively qualified "J" due to trip/field blank contamination.

5. The concentration reported by the laboratory is incorrectly calculated.
6. The laboratory failed to report the presence of the analyte in the sample.
7. The reported Hexavalent Chromium value was qualified because the Calibration Check Standard was not within the recovery range (90-110 percent).
8. In the Duplicate Sample Analysis, Hexavalent Chromium fell outside the control limits of + 20 percent for sample results > 4xRL or + RL for sample results < 4xRL. Therefore, the result was qualified.
9. This analyte was rejected because the laboratory performed the Duplicate Analysis on a field blank.
10. The reported value was qualified because the PVS recovery was greater than 115 percent.
11. The reported value was qualified because the PVS recovery was less than 85 percent.
12. The non-detected value was qualified (UJ) because the PVS recovery was less than 85 percent. The possibility of a false negative exists.
13. The reported analyte was qualified because the associated Calibration Blank result was greater than the MDL.
14. The laboratory made a transcription error. No hits were found in the raw data.
15. This analyte is rejected because the laboratory exceeded the holding time for digestion and analysis.
16. The laboratory subtracted the preparation/reagent blank from the sample result. The Reviewer's calculation puts the preparation/reagent blank back into the result.
17. The photocopy is unreadable. Therefore, the QA reviewer cannot read the laboratory's reported concentration result.
18. The reported value was qualified because the predigestion spike recovery was less than 75 %, but greater than 50%.
19. The reported value was qualified because the predigestion spike recovery was greater than 125 percent.
20. The non-detected value was qualified (UJ) because the redigestion spike recovery was less than 75 percent. The possibility of a false negative exists.

21. The reported result was qualified or rejected because the laboratory did not record the pH value(s) of the sample in a laboratory notebook.
22. The reported value was qualified (J/UJ) because the sample moisture content exceeded 50 percent.
23. The sample result was rejected because the soluble and insoluble matrix spike recoveries were less than 50%.
24. The detected sample result was qualified (J) because the incorrect spike concentration was used.
25. The reported sample results were rejected because the predigestion spike recovery was greater than 150 percent.
26. The reported sample results were rejected because the redigestion spike recovery was greater than 150 percent.
27. The reported value was qualified (J) because the redigestion spike recovery was less than 75 percent.
28. The reported value was qualified (J/UJ) because the sample digestion temperature was less than 90C.
29. In the Field Duplicate Sample Analysis, Hexavalent Chromium fell outside the control limits of $\pm 20\%$ for sample results $> 4 \times \text{RL}$ or $+ \text{RL}$ for sample results $< 4 \times \text{RL}$. Therefore, the result was qualified.
30. The reported value was qualified as estimated (J/UJ) but the bias is uncertain due to both high and low MS recoveries.
31. The reported result was greater than the MDL but less than the RL and qualified (J) as estimated by the laboratory.
32. The reported value was qualified because the sample replicate precision criterion of $\pm 20\%$ for method 7199 was exceeded.
33. The reported value was qualified (J/UJ) because the laboratory control sample (LCS) recovery was less than 80%.
34. The reported value was qualified (J) because the laboratory control sample (LCS) recovery was greater than 120%.
35. The reported result was qualified because the matrix spike analysis was not performed at the proper frequency.
36. The reported result was qualified because the laboratory duplicate analysis was not performed at the proper frequency.
37. The result was qualified because the cooler temperature upon sample receipt exceeded 6C.

38. The reported value was qualified because the redigestion spike recovery was greater than 125 percent.
39. The reported result was rejected because the laboratory failed to perform the reanalysis due to insufficient sample volume.
40. The reported results was qualified because the laboratory failed to analyze an ending CCB.
41. The result was qualified because of negative instrument drift.

Aqueous Target Analyte Summary Hit List (Hexavalent Chromium)

Site Name PPG Garfield Avenue Supplemental Remedial Investigation (GARIS) 90 & 98 Forrest Street IRM
Sampling Date July 14, 2014
Lab Name/ID Accutest, Dayton, NJ
SDG No JB71607
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID NA

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/L)	Laboratory Sample Result (mg/L)	Validation Sample Result (mg/L)	RL (mg/L)	Quality Assurance Decision	NJDEP Validation Footnote
114-FB20140714	JB71607-4	CHROMIUM (HEXAVALENT)	-0.004	U		0.010	Qualify	41

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

NJDEP Laboratory Footnote

1. The value reported is less than or equal to 3x the value in the preparation/reagent blank. It is the policy of NJDEP-DPFSR to negate the reported value due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
2. The value reported is greater than three (3) times but less than ten (10) times the value in the preparation/reagent blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to the preparation/reagent blank contamination. The "B" qualifier alerts the end-user to the presence of this analyte in the preparation/reagent blank.
3. The value reported is less than or equal to three (3) times the value in the trip/field blank. It is the policy of NJDEP-DPFSR to negate the reported value as due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
4. The value reported is greater than three (3) times but less than ten (10) times the value in the trip/field blanks and is considered "real". However, the reported value must be quantitatively qualified "J" due to trip/field blank contamination.
5. The concentration reported by the laboratory is incorrectly calculated.

6. The laboratory failed to report the presence of the analyte in the sample.
7. The reported Hexavalent Chromium value was qualified because the Calibration Check Standard was not within the recovery range (90-110 percent).
8. In the Duplicate Sample Analysis, Hexavalent Chromium fell outside the control limits of + 20 percent for sample results > 4xRL or + RL for sample results < 4xRL. Therefore, the result was qualified.
9. This analyte was rejected because the laboratory performed the Duplicate Analysis on a field blank.
10. The reported value was qualified because the PVS recovery was greater than 115 percent.
11. The reported value was qualified because the PVS recovery was less than 85 percent.
12. The non-detected value was qualified (UJ) because the PVS recovery was less than 85 percent. The possibility of a false negative exists.
13. The reported analyte was qualified because the associated Calibration Blank result was greater than the MDL.
14. The laboratory made a transcription error. No hits were found in the raw data.
15. This analyte is rejected because the laboratory exceeded the holding time for digestion and analysis.
16. The laboratory subtracted the preparation/reagent blank from the sample result. The Reviewer's calculation puts the preparation/reagent blank back into the result.
17. The photocopy is unreadable. Therefore, the QA reviewer cannot read the laboratory's reported concentration result.
18. The reported value was qualified because the predigestion spike recovery was less than 75 %, but greater than 50%.
19. The reported value was qualified because the predigestion spike recovery was greater than 125 percent.
20. The non-detected value was qualified (UJ) because the redigestion spike recovery was less than 75 percent. The possibility of a false negative exists.
21. The reported result was qualified or rejected because the laboratory did not record the pH value(s) of the sample in a laboratory notebook.

22. The reported value was qualified (J/UJ) because the sample moisture content exceeded 50 percent.
23. The sample result was rejected because the soluble and insoluble matrix spike recoveries were less than 50%.
24. The detected sample result was qualified (J) because the incorrect spike concentration was used.
25. The reported sample results were rejected because the predigestion spike recovery was greater than 150 percent.
26. The reported sample results were rejected because the redigestion spike recovery was greater than 150 percent.
27. The reported value was qualified (J) because the redigestion spike recovery was less than 75 percent.
28. The reported value was qualified (J/UJ) because the sample digestion temperature was less than 90C.
29. In the Field Duplicate Sample Analysis, Hexavalent Chromium fell outside the control limits of $\pm 20\%$ for sample results $> 4xRL$ or $+ RL$ for sample results $< 4xRL$. Therefore, the result was qualified.
30. The reported value was qualified as estimated (J/UJ) but the bias is uncertain due to both high and low MS recoveries.
31. The reported result was greater than the MDL but less than the RL and qualified (J) as estimated by the laboratory.
32. The reported value was qualified because the sample replicate precision criterion of $\pm 20\%$ for method 7199 was exceeded.
33. The reported value was qualified (J/UJ) because the laboratory control sample (LCS) recovery was less than 80%.
34. The reported value was qualified (J) because the laboratory control sample (LCS) recovery was greater than 120%.
35. The reported result was qualified because the matrix spike analysis was not performed at the proper frequency.
36. The reported result was qualified because the laboratory duplicate analysis was not performed at the proper frequency.
37. The result was qualified because the cooler temperature upon sample receipt exceeded 6C.
38. The reported value was qualified because the redigestion spike recovery was greater than 125 percent.

39. The reported result was rejected because the laboratory failed to perform the reanalysis due to insufficient sample volume.

40. The reported results was qualified because the laboratory failed to analyze an ending CCB.

41. The result was qualified because of negative instrument drift.

Attachment B

Data Validation Report Form

Client Name: PPG Industries	Project Number: 60314348.GA.RA.IRM
Site Location: PPG Garfield Avenue Supplemental Remedial Investigation (GARIS) 90 & 98 Forrest Street IRM, Jersey City, NJ	Project Manager: Scott Mikaelian
Laboratory: Accutest, Dayton, NJ	Type of Validation: Full
Laboratory Job No: JB71607 and JB71607R	Date Checked: 07/22/2014
Validator: Paula DiMattei	Peer: Lisa Krowitz

ITEM	YES	NO	N/A	COMMENTS
Sample results included?	X			
Reporting Limits met project requirements?	X			
Field I.D. included?	X			
Laboratory I.D. included?	X			
Sample matrix included?	X			
Sample receipt temperature 2-6C?	X			
Signed COCs included?	X			
Date of sample collection included?	X			
Date of sample digestion included?	X			
Holding time to digestion met criteria? (Soils -30 days from collection to digestion.)	X			
Date of analysis included?	X			
Holding time to analysis met criteria? (Soils -168 hours from digestion to analysis; Aqueous - 24 hours from collection to analysis.)	X			
Method reference included?	X			
Laboratory Case Narrative included?	X			

Definitions: MDL Method Detection Limit; %R Percent Recovery; RL Reporting Limit; RPD Relative Percent Difference; RSD Relative Standard Deviation :Corr Correlation Coefficient.

ITEM	YES	NO	N/A	COMMENTS
Initial calibration documentation included in lab package?	X			
1) Blank plus 4 standards (7196A) or blank plus 3 standards (7199)	X			
2) Correlation coefficient of =0.995 (7196A) or =0.999 (7199)	X			
3) Calibrate daily or each time instrument is set up.	X			
Calibration Check Standard (CCS) for 7196A and Quality Control Sample (QCS) for 7199 Included in Lab Package?	X			
1) %R criteria met? (90 - 110%)	X			
2) Correct frequency of one per every 10 samples	X			
3) CCS and QCS from independent source and at mid-level of calibration curve	X			
Calibration Blanks	X			
1) Analyzed prior to initial calibration standards and after each CCS/QCS?	X			
2) Absolute value should not exceed MDL.		X		The calibration blanks had amounts comparable to the MB results regarding negative drift. See nonconformance table
Method Blank, Field Blanks and/or Equipment Blanks Included in Lab Package?	X			
1) Method blank analyzed with each preparation batch?	X			
2) Absolute value should not exceed MDL.		X		see nonconformance table
Eh and pH Data	X			
1) Eh and pH data was included and plotted for all samples?	X			
Soluble Matrix Spike Data Included in Lab Package?	X			
1) Soluble Matrix %R criteria met? (75-125%R).		X		see nonconformance table.
2) Was the spike concentration 40 mg/Kg or twice the sample concentration?	X			
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	X			
Insoluble Matrix Spike Data Included in Lab Package?	X			
1) Insoluble Matrix %R criteria met? (75-125%R).	X			
2) Was the spike concentration around 400 to 800 mg/Kg?		X		Spiked at 801 mg/kg and 856 mg/kg.
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	X			

ITEM	YES	NO	N/A	COMMENTS
Post Digestion Spike	X			
1) Post Digestion Spike %R criteria met? (85-115%R).		X		see nonconformance table
2) Was the spike concentration 40 mg/Kg or twice the sample concentration?	X			
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	X			
Sample Duplicate Data Included in Lab Package?	X			
1) RPD criteria met? (RPD ≤20%) if both results are ≤4x RL or absolute difference ≤RL if either or both results are <4xRL.		X		see nonconformance table
2) Was a sample duplicate analyzed at the frequency of 1 per batch or 20 samples?	X			
Was a Laboratory Control Sample (LCS) Included in Lab Package?	X			
1) %R criteria met? (80-120%R).	X			
2) Was an LCS analyzed at the frequency of 1/batch or 20 samples?	X			
Were any Field Duplicate samples submitted with this SDG?		X		
1) Were Field duplicate RPD criteria met? (RPD≤20% for both sample results >4xRL or absolute difference ≤ RL if either or both results are <4xRL.			X	
Were all sample quantitation and reporting requirements met?	X			
1) Were all solid samples reported with percent solids > 50% ?	X			
2) Were any samples analyzed or reported with dilutions?	X			114-90F-IRM-20140714 was analyzed at a 2x dilution.
Miscellaneous Items	X			
1) For soils by 7196A, was the pH within a range of 7.0-8.0?	X			
2) For soils by 7199, was the pH within a range of 9.0-9.5?			X	
3) For aqueous by 7196A, was the pH with a range of 1.5-2.5?			X	
4) For soils (3060A), was the digestion temperature 90-95C for at least 60 minutes?	X			
5) For 7199, was each sample injected twice and was the RPD =20?			X	

Laboratory Blanks

Blank ID	Analyte	Result	QL	Units	Associated Samples
GP8279-MB1	CHROMIUM (HEXAVALENT)	-0.004	0.010	mg/L	114-FB20140714

Matrix Spikes

Sample ID	Analyte	Analysis Batch	Matrix Spike	% Recovery	Lower Limit	Upper Limit	PDS	pH-adjusted PDS	PDS Limit
114-98F-IRM-20140714-E	CHROMIUM (HEXAVALENT)	GP81583/GN8336	Soluble	74.5	75	125	97.1		85-115
114-98F-IRM-20140714-E	CHROMIUM (HEXAVALENT)	GP81583/GN83	Insoluble	96.5	75	125			
114-98F-IRM-20140714-E	CHROMIUM (HEXAVALENT)	GP81602/GN8402	Soluble	48.4	75	125	73.4	82.3	85-115
114-98F-IRM-20140714-E	CHROMIUM (HEXAVALENT)	GP81602/GN8402	Insoluble	95.2	75	125			

Lab Duplicates

Sample ID	Analyte	Sample Result	Qual	Duplicate Result	Qual	QL	Units	RPD
114-98F-IRM-20140714-E	CHROMIUM (HEXAVALENT)	1.5		2		0.41	mg/kg	28.6
114-98F-IRM-20140714-E	CHROMIUM (HEXAVALENT)	1.4		2		0.41	mg/kg	35.3

SDG#: JB71607
Batch: GN8336
 Cr+6 ICAL 07/15/14
 Soil
 (p. 37 of data pkg)

x - concentration	y - response
0	0
0.01	0.009
0.05	0.044
0.1	0.087
0.3	0.249
0.5	0.44
0.8	0.702
1	0.889

(p. 37 of data pkg)

AECOM Calculated Intercept	-0.0030	OK	Reported intercept	-0.0030
AECOM Slope	0.8856	OK	Reported Slope	0.8856
AECOM Calculated r	0.99984	OK	Reported r	0.99984

GP81583-B1
p.37

LCS calculation

Background Absorbance	0
Total absorbance	0.832
Total absorbance - background	0.832
Instrument Concentration	0.943
Sample weight (mg/kg)	0.0025
Final Volume (L)	0.1
Dilution Factor	1

AECOM Calculated LCS Result (mg/Kg)	37.7	OK	Reported Result (mg/Kg)	37.7
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%R = Found/True*100

p. 20

True Value (mg/kg)	40
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AECOM Calculated %R	94.3	OK	Reported %R	94.3
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MS calculation

JB71607-3 [114-98F-IRM-20140714-E] p.37

Background reading	0
Total absorbance	0.366
Total absorbance - background	0.366
Instrument Concentration	0.4167
Sample weight (mg/kg)	0.00252
Final Volume (L)	0.1
Percent solids	0.98
Dilution Factor	50

AECOM Calculated MS Result (mg/Kg)	844	OK	Reported Result (mg/Kg)	844
------------------------------------	-----	----	-------------------------	-----

%R = Found/True*100

JB71607-3 [114-98F-IRM-20140714-E] p.22

True Value (mg/kg)	873
Native concentration (mg/Kg)	1.5

AECOM%R	96.5	OK	Reported %R	96.5
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Percent Solids

JB71607-3 [114-98F-IRM-20140714-E] p.23

Empty dish weight=	27.72
Wet weight=	33.24
Dry weight=	33.13

AECOM%solids =	98	OK	reported %solids=	98
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Reporting Limit		JB71607-3 [114-98F-IRM-20140714-E] p.10		
Low Standard	0.01			
Initial weight (mg/kg)	0.00245			
Final volume (L)	0.1			
Percent solids	0.98			
Dilution Factor	1			
Reporting Limit	0.42	OK rounding	Reported RL (mg/Kg)=	0.41

Sample Calculations

		JB71607-3 [114-98F-IRM-20140714-E] p.10, 37		
Background reading	0.021			
Total absorbance	0.049			
Total absorbance - background	0.028			
Instrument Response	0.035			
Sample weight (mg/kg)	0.00245			
Final Volume (L)	0.1			
Percent solids	0.98			
Dilution Factor	1			
AECOM Calculated Result (mg/Kg)	1.5	OK	Reported Result (mg/Kg)	1.5

Data Validation Report

Project:	PPG Garfield Avenue Supplemental Remedial Investigation (GARIS) 90 & 98 Forrest Street IRM	
Laboratory:	Accutest, Dayton, NJ	
Laboratory Job No.:	JB71607A	
Analysis/Method:	Total Chromium by ICP-AES/ SW846-6010	
Validation Level:	Limited	
Site Location/Address:	PPG 90 & 98 Forrest Street, Jersey City, NJ	
AECOM Project No:	60314348.GA.RA.IRM	
Prepared by:	Paula DiMattei /AECOM	Completed on: 07/24/2014
Reviewed by:	Lisa Krowitz /AECOM	File Name: JB71607A_2014-07-24_DV Report-F

Introduction

The data were reviewed in accordance with the FSP-QAPP and the following NJDEP validation Standard Operating Procedures (SOP):

- NJDEP Office of Data Quality SOP 5.A.16, Rev 1 (May 2002), Quality Assurance Data Validation of Analytical Deliverables for Inorganics (based on USEPA SW-846 Methods)

The results of quality control data analyzed with site samples were used to assess the overall reliability of the data. The following qualifiers were used to identify data quality issues:

- U: Indicates the analyte was not detected in the sample above the sample reporting limit.
- J: Indicates the result was an estimated value; the associated numerical value was an approximate concentration of the analyte in the sample.
- UJ: Indicates the analyte was not detected above the reporting limit and the reporting limit was approximate.
- R: The sample result was rejected due to serious deficiencies; the presence or absence of the analyte could not be confirmed.
- RA: The sample result was rejected but is still considered usable.

Sample Information

The samples listed below were collected by AECOM on July 14, 2014 as part of the PPG Garfield Avenue Supplemental Remedial Investigation (GARIS) - 90 & 98 Forrest Street IRM sampling at PPG 90 & 98 Forrest Street, Jersey City, NJ. Only the samples and parameters listed below were validated.

Field ID	Laboratory ID	Matrix	Fraction
114-90F-IRM-20140714	JB71607-1A	Soil	Total Chromium
114-98F-IRM-20140714-E	JB71607-3A	Soil	Total Chromium
114-98F-IRM-20140714-W	JB71607-2A	Soil	Total Chromium
114-FB20140714 (Equipment Blank)	JB71607-4A	Aqueous	Total Chromium

The samples were collected following the procedures detailed in the Field Sampling Plan/Quality Assurance Project Plan for Non-Residential and Residential Chromium Sites Hudson County, New Jersey (December 2011).

General Comments

The data package was complete. Quality control (QC) issues identified during validation are discussed below. Refer to the Target Analyte Summary Hit(s) in Attachment A for a listing of all detected results, qualified results, and associated qualifications, where applicable. The nonconformances for each section discussed below are presented in Attachment B.

Laboratory Blanks/Equipment Blanks

Method Blank

Chromium was detected in the method blank (MP80638-MB1) associated with all soil samples in this SDG, at a concentration above the MDL, but below the RL. Since the results for chromium in the associated soil samples were greater than ten times the amount detected in the method blank, no qualifications were required.

Data Quality and Usability

In general, these data appear to be valid and may be used for decision-making purposes. No data were rejected or qualified and may be used as reported from the laboratory.

ATTACHMENTS

Attachment A: Target Analyte Summary Hitlist(s)

Attachment B: Data Validation Report Form

Attachment A

Target Analyte Summary Hitlist(s)

Soil Target Analyte Summary Hit List (Total Chromium)

Site Name PPG Garfield Avenue Supplemental Remedial Investigation (GARIS) 90 & 98 Forrest Street IRM
Sampling Date July 14, 2014
Lab Name/ID Accutest, Dayton, NJ
SDG No JB71607A
Sample Matrix Soil
Trip Blank ID NA
Field Blank ID 114-FB20140714

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
114-90F-IRM-20140714	JB71607-1A	CHROMIUM	0.13	127	127	0.92		
114-98F-IRM-20140714-E	JB71607-3A	CHROMIUM	0.13	24.5	24.5	0.87		
114-98F-IRM-20140714-W	JB71607-2A	CHROMIUM	0.13	10.9	10.9	0.93		

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

NJDEP Laboratory Footnote

1. The value reported is less than or equal to 3x the value in the method blank. It is the policy of NJDEP-DPFSR to negate the reported value due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
2. The value reported is greater than three (3) but less than ten (10) times the value in the method blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to the method blank contamination. The "B" qualifier alerts the end-user to the presence of this analyte in the method blank.
3. The value reported is less than or equal to 3x the value in the field blank. It is the policy of NJDEP-DPFSR to negate the reported value as due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
4. The value reported is greater than 3x but less than ten (10) the value in the field blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to trip/field blank contamination.

5. The concentration reported by the laboratory is incorrectly calculated.
6. The laboratory failed to report the presence of the analyte in the sample.
7. The reported metal value was qualified because the Calibration Verification Standard was not within the recovery range (90-110 percent).
8. In the MS/MSD Sample Analysis, this analyte fell outside the control limits of 20% RPD. Therefore, the result was qualified.
9. This analyte was qualified because the laboratory performed the MS/MSD Analysis on a field blank.
10. The reported analyte was qualified because the associated Calibration Blank result was greater than the MDL.
11. The reported value was qualified because serial dilution analysis was not within QC limit of 10% D.
12. This analyte is rejected because the laboratory exceeded the holding time for digestion and analysis.
13. The laboratory subtracted the method blank from the sample result. The reviewer's calculation has added the method blank result to the reported concentration.
14. The photocopy submitted is illegible. Therefore, the QA reviewer cannot read the laboratory's reported concentration result.
15. The reported or nondetected value was qualified because the MS/MSD spike recovery was less than 75 percent.
16. The reported value was qualified because the MS/MSD spike recovery was greater than 125 percent.
17. The reported value was qualified as estimated (J/UJ) but the bias is uncertain due to both high and low MS recoveries.
18. The reported values were qualified because the laboratory duplicate exceeded 35 percent RPD for results greater than 5X the reporting limit or the absolute difference exceeded two times the reporting limit for sample result less than 5 times the reporting limit.
19. The reported value was qualified because the field duplicate exceeded 35 percent RPD for results greater than 5X the reporting limit or the absolute difference exceeded two times the reporting limit for sample result less than 5 times the reporting limit.
20. The reported value was qualified because the LCS recovery was less than 80 percent.
21. The reported value was qualified because the sample moisture content was greater than 50 percent.

22. The reported value was rejected because the field duplicate absolute difference was greater than 4 times the RL or the RPD was greater than 120%.
23. The reported result was greater than the MDL but less than the RL and qualified (J) as estimated by the laboratory.
24. The field duplicate absolute difference exceeded two times the reporting limit for sample result less than 5 times the reporting limit.
25. The reported value was qualified because the LCS recovery was greater than 120 percent.

Attachment B

Data Validation Report Form

Client Name: PPG Industries				Project Number: 60314348.GA.RA.IRM	
Site Location: PPG Garfield Avenue Supplemental Remedial Investigation (GARIS) 90 & 98 Forrest Street IRM, Jersey City, NJ				Project Manager: Scott Mikaelian	
Laboratory: Accutest, Dayton, NJ				Type of Validation: Limited	
Laboratory Job No: JB71607A				Date Checked: 07/24/2014	
Validator: Paula DiMattei				Peer: Lisa Krowitz	
ITEM	YES	NO	N/A	COMMENTS	
Sample results included?	X				
Reporting Limits met project requirements?	X				
Field I.D. included?	X				
Laboratory I.D. included?	X				
Sample matrix included?	X				
Sample receipt temperature 2-6C?	X				
Signed COCs included?	X				
Date of sample collection included?	X				
Date of sample digestion included?	X				
Date of analysis included?	X				
Holding time met QC criteria? (Metals -180 days from sample collection; Mercury - 28 days from sample collection. If HT exceeded by 10 days R all results.	X				
Method reference included?	X				
Laboratory Case Narrative included?	X				
<p>Definitions: MDL Method Detection Limit; %R Percent Recovery; RL Reporting Limit; RPD Relative Percent Difference; RSD Relative Standard Deviation ;Corr Correlation Coefficient.</p>					

ITEM	YES	NO	N/A	COMMENTS
Sample dilutions?		X		
Initial calibration documentation included in lab package?			X	NA for a Limited Review
1) Calibrate daily or each time instrument is set up.			X	
2) ICP (6010) -Blank plus 1 standard? If no, reject (R) data.			X	
3) Hg (7470/7471) -Blank plus 5 standards? If no, reject (R) data.			X	
Initial Calibration Verification Standard (ICV) for ICP (6010) and Initial Calibration Check Standard (ICCS) for Hg (7470/7471) included in lab package?			X	
1) Analyzed immediately after initial calibration? If no, reject (R) data.			X	
2) %R criteria met? (90-110%). If no, J positive results for affected analyte(s) if %R between 80-89% and 111-120% and indicate bias; UJ non-detect results for affected analyte(s) if %R between 80-89% , and R all data for affected analyte(s) if %R 120%.			X	
3) Spot check ICV/ICCS results for several analytes.			X	
Continuing Calibration Verification Standard (CCV) for ICP (6010) and Calibration Check Standard (CCS) for Hg (7470/7471) included in Lab Package?			X	
1) Analyzed immediately after each ICV/ICC/CB and after every 10 samples? If no, reject (R) data.			X	
2) CCS and CCV from independent source and at mid-level of calibration curve. If no, reject (R) data.			X	
3) %R criteria met? (90-110%R). If no, J positive results for affected analyte(s) if %R between 80-89% and 111-120% and indicate bias; UJ non-detect results for affected analyte(s) if %R between 80-89% and R all data for affected analyte(s) if %R 120%.			X	
4) Spot check CCV/CCS results for several analytes.			X	
Low Calibration Standard (CRI) included in Lab Package?			X	
1) %R criteria met? - 50-150% for Co, Mn, Zn, by ICP-MS; Pb, Tl by 6010; 70-130% all others. If no, refer to ILM05.4 NJ SOP 5.A.2 for actions.			X	

ITEM	YES	NO	N/A	COMMENTS
Calibration Blanks			X	NA for a Limited Review
1) Analyzed after daily calibration and after each ICV/ICC/CCV/CCS and after every 10 samples? If no, reject (R) data.			X	
2) Absolute value 10xCB result, no qualification.			X	
Method Blank Included in Lab Package?	X			
1) Method blank analyzed with each preparation batch or every SDG, or 1/20 samples? If no, reject (R) data, except no aqueous MB required for FB/EB if only soil samples were analyzed.	X			
2) Method blank analyzed 1/20 samples? If - MB 1/25, J sample results from 21-25; -MB >1/25, R sample results after 25th sample.	X			
3) MB results nondetect? If no, -sample result 3xMB but 10xMB, no qualification.		X		See nonconformance table below.
4) Negative MB result reported? If yes, -Positive sample result		X		
Field Blanks/Equipment Blanks Included in Lab Package?	X			114-FB20140714
1) FB/EB result non-detect? If no, -sample result 3xFB/EB but 10xFB/EB, no qualification.	X			
ICP Interference Check Sample (ICS) included in Lab Package?			X	NA for a Limited Review
1) Analyzed at beginning of analytical run? If no, reject (R) data.			X	
2) %R criteria met? (80-120%) If no, %R>120%, no qualification if sample result non-detect; %R between 121-150%, J positive results, biased high; %R between 50-79%, J/UJ results, biased low; %R150%, reject (R) result			X	
3) Spot check accuracy of %Rs			X	
Matrix Spike/Matrix Spike Duplicate Data Included in Lab Package?	X			Batch QC was not assessed.
1) MS/MSD %R (75-125%R) and RPD (+20%) criteria met? - %R>125% J positive results for affected analyte(s) for all samples in the same batch/SDG, accept NDs; -%R			X	
2) Was a sample spiked at the frequency of 1/batch or 20 samples?			X	
3) Was the MS performed on a site sample?		X		
4) Was the MS performed on a FB/EB or TB? If yes, J all sample data.			X	

ITEM	YES	NO	N/A	COMMENTS
Post Digestion Spike			X	NA for a Limited review
1) %R criteria met? (75-125%R) - %R>125% J positive results for affected analyte(s) for all samples in the same batch/SDG, accept NDs.; - %R			X	
2) Was the spike performed on a FB/EB or TB? If yes, J all sample data.			X	
3) Was a sample spiked at the frequency of 1/batch or 20 samples?			X	
Laboratory Duplicate Data Included in Lab Package?			X	An MS/MSD was performed in lieu of a laboratory duplicate.
Aqueous - If RPD is >20% but 5x the QL, estimate (J) results >the QL. - If RPD is >100%, reject R results >/= the QL.- If sample and/or duplicate is the QL, estimate (J) positive results 2x the QL, reject R non-detects and positive results			X	
Soil - If RPD is >35% but 5x the QL, estimate (J) results > the QL. - If RPD is >120%, reject results > the QL. - If sample and/or duplicate is 2x the QL, estimate (J) positive results 4x the QL, reject nondetects and positive results			X	
Was a Laboratory Control Sample (LCS) Included in Lab Package?	X			
1) LCS %R criteria met? (80-120%R). If no, J/UJ all affected analytes(s) for all samples in the same batch/SDG.	X			
2) Was an LCS analyzed at the frequency of 1/batch or 20 samples? If no, J/UJ affected analyte(s) for all samples in the same batch/SDG.	X			
Serial Dilution			X	NA for a Limited review
1) %D(25xIDL (7000) or >10xIDL (6010) and %D >10% J positive results for affected analyte(s) for all samples in the same batch/SDG, accept NDs.			X	
2) Was the frequency 1/batch or 20 samples?			X	
3) Was a site sample used?			X	
4) Was a FB/EB or TB used? If yes, J all sample data.			X	
5) Spot check accuracy of %Ds.			X	

ITEM	YES	NO	N/A	COMMENTS
Field Duplicate Data included in Lab Package?		X		
Aqueous - If RPD is >20% but 5x the QL, estimate (J) results > the QL. - If RPD is >100%, reject R results >= the QL. - If sample and/or duplicate is the QL, estimate (J) positive results 2x the QL, reject R non-detects and positive results			X	
Soil - If RPD is >35% but 5x the QL, estimate (J) results > the QL. - If RPD is >120%, reject results > the QL. - If sample and/or duplicate is 2x the QL, estimate (J) positive results 4x the QL, reject nondetects and positive results			X	
Percent Solids data included in Lab Package?	X			
1) %Solids criteria (Reg 2 criteria) met? (>=50%)	X			

Laboratory Blanks

Blank ID	Analyte	Result	QL	Units	Associated Samples
MP80638-MB1	Chromium	0.13	0.98	mg/kg	All soil samples

Data Validation Report

Project:	PPG Garfield Avenue – Forrest Street Additional Remedial Investigation (GARIS)	
Laboratory:	Accutest, Dayton, NJ	
Laboratory Job No.:	JB95926, JB95926A, and JB95926R	
Analysis/Method:	Hexavalent Chromium SW846 3060A/7196 Select Metals SW846 3050B/6010C	
Validation Level:	Full (Hexavalent Chromium) Limited (Select Metals)	
Site Location/Address:	90 & 98 Forrest Street Jersey City, NJ	
AECOM Project No:	60279173.GA.RI.RPT.FOR	
Prepared by:	Justin Webster /AECOM	Completed on: 7/8/2015
Reviewed by:	Lisa Krowitz/AECOM	File Name: JB95926_A_R_2015_7_8_DV Report-F

Introduction

The data were reviewed in accordance with the FSP-QAPP and the following NJDEP guidance documents and validation Standard Operating Procedures (SOP):

- NJDEP Office of Data Quality SOP 5.A.10, Rev 3 (September 2009), SOP for Analytical Data Validation of Hexavalent Chromium - for USEPA SW-846 Method 3060A, and USEPA SW-846 Method 7196A;
- NJDEP Office of Data Quality SOP 5.A.16, Rev 1 (May 2002), Quality Assurance Data Validation of Analytical Deliverables for Inorganics (based on USEPA SW-846 Methods)
- Data Quality Assessment and Data Usability Evaluation Technical Guidance, version 1.0, April 2014;
- Data of Known Quality Protocols Technical Guidance, version 1.0, April 2014;

The results of quality control data analyzed with site samples were used to assess the overall reliability of the data. The following qualifiers were used to identify data quality issues

- U: Indicates the analyte was not detected in the sample above the sample reporting limit.
- J: Indicates the result was an estimated value; the associated numerical value was an approximate concentration of the analyte in the sample.

- UJ: Indicates the analyte was not detected above the reporting limit and the reporting limit was approximate.
- UB: The analyte concentration is less than or equal to three (3) times the concentration in the associated method/prep blank. The presence of the analyte in the sample is negated (UB) due to laboratory contamination.
- JB: The analyte concentration is greater than three (3) times, but less than or equal to ten (10) times the concentration in the associated method/prep blank. The presence of that analyte in the sample is considered "real". The concentration is quantitatively qualified (JB) due to method blank contamination.
- R: The sample result was rejected due to serious deficiencies; the presence or absence of the analyte could not be confirmed.
- RA: The sample result was rejected but is still considered usable.

Sample Information

The samples listed below were collected by AECOM on June 1, 2015 as part of the PPG Garfield Avenue – Forrest Street Additional Remedial Investigation (GARIS) sampling at 90 & 98 Forrest Street Jersey City, NJ. Only the samples and parameters listed below were validated.

Field ID	Laboratory ID	Matrix	Fraction
EF-73A-0.0-0.5	JB95926-1,1A,1R	Soil	Hexavalent Chromium, Select Metals
EF-73A-2.0-2.5	JB95926-2,2A,2R	Soil	Hexavalent Chromium, Select Metals
EF-73A-4.0-4.5	JB95926-3,3A,3R	Soil	Hexavalent Chromium, Select Metals
EF-73A-6.0-6.5	JB95926-4,4A,4R	Soil	Hexavalent Chromium, Select Metals
EF-73A-8.0-8.5	JB95926-5,5A,5R	Soil	Hexavalent Chromium, Select Metals
EF-73A-GWF-10.0-14.0 (Filtered)	JB95926-6,6A,6R	Aqueous	Hexavalent Chromium, Total Chromium
EF-73A-GWU-10.0-14.0 (Unfiltered)	JB95926-7,7A,7R	Aqueous	Hexavalent Chromium, Total Chromium
EF-73A-10.0-10.5	JB95926-8,8A,8R	Soil	Hexavalent Chromium, Select Metals
EF-73A-10.0-10.5X (Field duplicate of EF-73A-10.0-10.5)	JB95926-9,9A,9R	Soil	Hexavalent Chromium, Select Metals
EF-73A-12.0-12.5	JB95926-10,10A,10R	Soil	Hexavalent Chromium, Select Metals
EF-73A-14.0-14.5	JB95926-11,11A,11R	Soil	Hexavalent Chromium, Select Metals
EF-73A-16.0-16.5	JB95926-12,12A,12R	Soil	Hexavalent Chromium, Select Metals
EF-73A-18.0-18.5	JB95926-13,13A,13R	Soil	Hexavalent Chromium, Select Metals
EF-73A-GWU-20.0-24.0 (Unfiltered)	JB95926-14,14A,14R	Aqueous	Hexavalent Chromium, Total Chromium
EF-73AGWF-20.0-24.0 (Filtered)	JB95926-15,15A,15R	Aqueous	Hexavalent Chromium, Total Chromium
FB-2015601 (Field Blank)	JB95926-16,16A,16R	Aqueous	Hexavalent Chromium, Total Chromium

The samples were collected following the procedures detailed in the Forrest Street Additional Remedial Investigation Work Plan dated April 27, 2015

General Comments

The data package was complete. Quality control (QC) issues identified during validation are discussed below. Refer to the Target Analyte Summary Hit(s) in Attachment A for a listing of all detected results, qualified results, and associated qualifications, where applicable. The nonconformances for each section discussed below are presented in Attachment B.

Hexavalent Chromium

MS Results

Soil

Sample EF-73A-8.0-8.5 (JB95926-5) was selected for the soil matrix spike (MS) analysis and was used for supporting data quality recommendations. The soluble and insoluble MS recoveries (%Rs) from the initial batch were 73.8% and 101%, respectively. The soluble MS did not meet quality control (QC) criteria of 75-125%R. The post digestion spike (PDS) recovery was 97%, which met the PDS criteria of 85-115%.

Due to low soluble MS %R, the MS and soil samples were reanalyzed using Method 7196A. The soluble and insoluble MS results from the reanalysis batch were 74.9% and 109.0%, respectively. Again the soluble MS did not meet QC criteria of 75-125%R. The PDS %R was 83% and after pH adjustment was 111%, which met the PDS criteria of 85-115%.

Since the soluble MSs failed to meet QC criteria, additional parameters were analyzed to determine if possible matrix interferences could be the cause for the poor MS %Rs. All the soil samples were tested for pH and oxidation reduction potential (ORP), and plotted on an Eh/pH phase diagram. From this chart, the source sample for the MS analysis of sample EF-73A-8.0-8.5 (JB95926-5) was plotted slightly below the phase change line, indicating reducing potential within the sample matrix, incapable of supporting hexavalent chromium. Analyses for ferrous iron, sulfide screen, and total organic carbon (TOC) were performed on the MS source sample to confirm the reducing potential within the sample matrix. The sulfide screen was reported as nondetect, indicating no reducing agents within the sample matrix; however, the ferrous iron (0.56%) and the TOC results (642 mg/Kg) were positive, indicating potential reducing agents within the sample matrix.

The soluble MS %Rs from the initial and reanalysis did not meet the MS QC requirements, but all MS %Rs were greater than 50%; therefore, the highest detected hexavalent chromium result or the nondetect hexavalent chromium result with the lowest reporting limit (RL) was reported for each soil sample. The reported hexavalent chromium results in all the soil samples were qualified as estimated (J/UJ) due to the poor soluble MS %Rs.

Groundwater

Unfiltered sample EF-73A-GWU-20.0-24.0 (JB95926-14) was used as a source sample for the MS analysis in this SDG. The initial MS recovery was 95.7% which met the QC requirements of 75-125%R. No data qualification was necessary on this basis.

Filtered sample EF-73A-GWU-20.0-24.0 (JB95926-15) was also selected as a source sample for the MS analysis in this SDG. The initial MS recovery was 95.1% which met the QC requirements of 75-125%R. No data qualification was necessary on this basis.

Field Duplicate Results

Samples EF-73A-10.0-10.5 and EF-73A-10.0-10.5X were collected as the field duplicate (FD) pair in this SDG. Hexavalent chromium met the precision criteria of \pm RL for sample results \leq 5xRL.

Sample Results

The concentration of total chromium was compared to the concentration of hexavalent chromium to ensure that the total chromium concentration was greater than the hexavalent chromium concentration. No data were qualified on this basis.

Hexavalent chromium results (flagged B by the laboratory) that were less than the RL, but greater than or equal to the method detection limit (MDL) are approximate values and have been qualified as estimated (J).

TAL Metals

Method Blank

Chromium was detected in the MB associated with the soil samples collected in this SDG, at concentration above the MDL, but below the RL. Since affected soil sample results were greater than 10 times the MB contamination concentration, data qualifications were not necessary.

Negative instrument drift was detected for chromium in the MB associated with the aqueous field blank and aqueous samples collected in SDG. The potential for falsely nondetect and bias low sample results exist for the chromium results in samples EF-73A-GWF-10.0-14.0 and FB-20150601. Refer to Attachment B, Blanks nonconformance, and the Hits List for a listing of all negative blank results and the qualified aqueous data.

Negative instrument drift was detected for thallium in the MB associated with the soils samples collected in SDG. The potential for falsely nondetect and bias low sample results exist for several soil samples. Refer to Attachment B, Blanks nonconformance, and the Hits List for a listing of all negative blank results and the qualified soil data.

Matrix Spike/Matrix Spike Duplicate (MS/MSD)

Site sample EF-73A-8.0-8.5 (JB95926-5A) was used for the MS/MSD analysis in association with the soil samples collected in this SDG. The MS and MSD for antimony were recovered at levels less than 75% indicating possible matrix interferences and the potential for biased low sample results. All antimony soil sample results within this SDG were qualified (J/UJ) as estimated with the potential for low bias.

Site sample EF-73A-GWU-20.0-24.0 (JB95926-14A) was used for the MS/MSD analysis in association with the unfiltered aqueous samples collected in this SDG. The MS and MSD for chromium were recovered at levels less than 75% indicating possible matrix interferences and the potential for biased low sample results. Therefore, total chromium results in unfiltered aqueous samples EF-73A-GWU-10.0-14.0 and EF-73A-GWU-20.0-24.0 were qualified (J) as estimated with the potential for low bias.

Site sample EF-73A-GWF-20.0-24.0 (JB95926-15A) was used for the MS/MSD analysis in association with the filtered aqueous samples collected in this SDG. The MS and MSD for chromium met applicable QC requirements; therefore, filtered aqueous results were acceptable as submitted by the laboratory.

Field Duplicate Results

Samples EF-73A-10.0-10.5 and EF-73A-10.0-10.5X were collected as the field duplicate pair in this SDG. All precision QC requirements were met. No data qualifications were necessary on this behalf.

Sample Results

TAL metals results (flagged B by the laboratory) that were less than the RL, but greater than or equal to the MDL are approximate values and have been qualified as estimated (J).

Data Quality and Usability

In general, these data appear to be valid and may be used for decision-making purposes. No data were rejected. Qualified results are presented in Attachments A and B.

The hexavalent chromium soil results in this SDG are usable as estimated values with the potential for low bias due to low MS recoveries. A reducing potential was indicated by the ancillary parameters (Eh/pH phase diagram, ferrous iron, and total organic carbon) suggesting that the matrix for this sample was not capable of supporting hexavalent chromium. The highest detected hexavalent chromium result or the nondetect hexavalent chromium result with the lowest RL between the initial analysis and reanalysis was reported for the soil samples in this SDG.

Chromium and thallium results qualified due to negative blank contamination are usable as estimated values with potential low bias.

Antimony soil sample results qualified due to low MS/MSD recovery are usable as estimated values with low bias.

Unfiltered chromium aqueous sample results qualified due to low MS/MSD recovery are usable as estimated values with low bias.

Sample results reported between the MDL and RL are usable as estimated values with an unknown directional bias.

ATTACHMENTS

Attachment A: Target Analyte Summary Hitlist(s)

Attachment B: Data Validation Report Form

Attachment A

Target Analyte Summary Hitlist(s)

Soil Target Analyte Summary Hit List Hexavalent Chromium

Site Name PPG Garfield Avenue – Forrest Street Additional Remedial Investigation (GARIS)
Sampling Date June 1, 2015
Lab Name/ID Accutest, Dayton, NJ
SDG No JB95926 and JB95926R
Sample Matrix Soil
Trip Blank ID NA
Field Blank ID FB-20150601

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
EF-73A-0.0-0.5	JB95926-1	CHROMIUM (HEXAVALENT)	U	U	U	0.44	Qualify	20
EF-73A-12.0-12.5	JB95926-10R	CHROMIUM (HEXAVALENT)	U	4.7	4.7	0.48	Qualify	18
EF-73A-14.0-14.5	JB95926-11R	CHROMIUM (HEXAVALENT)	U	8.9	8.9	0.46	Qualify	18
EF-73A-16.0-16.5	JB95926-12R	CHROMIUM (HEXAVALENT)	U	6.3	6.3	0.46	Qualify	18
EF-73A-18.0-18.5	JB95926-13	CHROMIUM (HEXAVALENT)	U	7.6	7.6	0.47	Qualify	18
EF-73A-2.0-2.5	JB95926-2	CHROMIUM (HEXAVALENT)	U	U	U	0.49	Qualify	20
EF-73A-4.0-4.5	JB95926-3R	CHROMIUM (HEXAVALENT)	U	6.1	6.1	0.54	Qualify	18
EF-73A-6.0-6.5	JB95926-4	CHROMIUM (HEXAVALENT)	U	U	U	0.51	Qualify	20
EF-73A-8.0-8.5	JB95926-5R	CHROMIUM (HEXAVALENT)	U	0.28	0.28	0.50	Qualify	18,31
EF-73A-10.0-10.5	JB95926-8R	CHROMIUM (HEXAVALENT)	U	1.4	1.4	0.49	Qualify	18
EF-73A-10.0-10.5X	JB95926-9R	CHROMIUM (HEXAVALENT)	U	0.95	0.95	0.49	Qualify	18

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

NJDEP Soil Hexavalent Chromium Laboratory Footnote

1. The value reported is less than or equal to 3x the value in the preparation/reagent blank. It is the policy of NJDEP-DPFSR to negate the reported value due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.

2. The value reported is greater than three (3) times but less than ten (10) times the value in the preparation/reagent blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to the preparation/reagent blank contamination. The "B" qualifier alerts the end-user to the presence of this analyte in the preparation/reagent blank.

3. The value reported is less than or equal to three (3) times the value in the trip/field blank. It is the policy of NJDEP-DPF SR to negate the reported value as due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
4. The value reported is greater than three (3) times but less than ten (10) times the value in the trip/field blanks and is considered "real". However, the reported value must be quantitatively qualified "J" due to trip/field blank contamination.
5. The concentration reported by the laboratory is incorrectly calculated.
6. The laboratory failed to report the presence of the analyte in the sample.
7. The reported Hexavalent Chromium value was qualified because the Calibration Check Standard was not within the recovery range (90-110 percent).
8. In the Duplicate Sample Analysis, Hexavalent Chromium fell outside the control limits of ≤ 20 percent for sample results $> 4xRL$ or $+ RL$ for sample results $< 4xRL$. Therefore, the result was qualified.
9. This analyte was rejected because the laboratory performed the Duplicate Analysis on a field blank.
10. The reported value was qualified because the PVS recovery was greater than 115 percent.
11. The reported value was qualified because the PVS recovery was less than 85 percent.
12. The non-detected value was qualified (UJ) because the PVS recovery was less than 85 percent. The possibility of a false negative exists.
13. The reported analyte was qualified because the associated Calibration Blank result was greater than the MDL.
14. The laboratory made a transcription error. No hits were found in the raw data.
15. This analyte is rejected because the laboratory exceeded the holding time for digestion and analysis.
16. The laboratory subtracted the preparation/reagent blank from the sample result. The Reviewer's calculation puts the preparation/reagent blank back into the result.
17. The photocopy is unreadable. Therefore, the QA reviewer cannot read the laboratory's reported concentration result.

18. The reported value was qualified because the predigestion spike recovery was less than 75 %, but greater than 50%.
19. The reported value was qualified because the predigestion spike recovery was greater than 125 percent.
20. The non-detected value was qualified (UJ) because the predigestion and or redigestion spike recovery was less than 75 percent. The possibility of a false negative exists.
21. The reported result was qualified or rejected because the laboratory did not record the pH value(s) of the sample in a laboratory notebook.
22. The reported value was qualified (J/UJ) because the sample moisture content exceeded 50 percent.
23. The sample result was rejected because the soluble and insoluble matrix spike recoveries were less than 50%.
24. The detected sample result was qualified (J) because the incorrect spike concentration was used.
25. The reported sample results were rejected because the predigestion spike recovery was greater than 150 percent.
26. The reported sample results were rejected because the redigestion spike recovery was greater than 150 percent.
27. The reported value was qualified (J) because the redigestion spike recovery was less than 75 percent.
28. The reported value was qualified (J/UJ) because the sample digestion temperature was less than 90C.
29. In the Field Duplicate Sample Analysis, Hexavalent Chromium fell outside the control limits of < 50% for sample results > 5xRL.
30. The reported value was qualified as estimated (J/UJ) but the bias is uncertain due to both high and low MS recoveries.
31. The reported result was greater than the MDL but less than the RL and qualified (J) as estimated by the laboratory.
32. The reported value was qualified because the sample replicate precision criterion of < 20% for method 7199 was exceeded.
33. The reported value was qualified (J/UJ) because the laboratory control sample (LCS) recovery was less than 80%.
34. The reported value was qualified (J) because the laboratory control sample (LCS) recovery was greater than 120%.

35. The reported result was qualified because the matrix spike analysis was not performed at the proper frequency.
36. The reported result was qualified because the laboratory duplicate analysis was not performed at the proper frequency.
37. The result was qualified because the cooler temperature upon sample receipt exceeded 6°C.

Aqueous Target Analyte Summary Hit List Hexavalent Chromium

Site Name PPG Garfield Avenue – Forrest Street Additional Remedial Investigation (GARIS)
Sampling Date June 1, 2015
Lab Name/ID Accutest, Dayton, NJ
SDG No JB95926 and JB95926R
Sample Matrix Soil
Trip Blank ID NA
Field Blank ID FB-20150601

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
EF-73A-GWU-20.0-24.0	JB95926-14	CHROMIUM (HEXAVALENT)	U	6.3	6.3	1.0		
EF-73AGWF-20.0-24.0	JB95926-15	CHROMIUM (HEXAVALENT)	U	11.7	11.7	1.0		

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

NJDEP Aqueous Hexavalent Chromium Laboratory Footnote

- The value reported is less than or equal to 3x the value in the preparation/reagent blank. It is the policy of NJDEP-DPFSR to negate the reported value due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
- The value reported is greater than three (3) times but less than ten (10) times the value in the preparation/reagent blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to the preparation/reagent blank contamination. The "B" qualifier alerts the end-user to the presence of this analyte in the preparation/reagent blank.
- The value reported is less than or equal to three (3) times the value in the trip/field blank. It is the policy of NJDEP-DPFSR to negate the reported value as due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
- The value reported is greater than three (3) times but less than ten (10) times the value in the trip/field blanks and is considered "real". However, the reported value must be quantitatively qualified "J" due to trip/field blank contamination.
- The concentration reported by the laboratory is incorrectly calculated.

6. The laboratory failed to report the presence of the analyte in the sample.
1. The reported value was qualified because the Calibration Verification Standard was not within the recovery range (90-110 percent).
2. In the MS/MSD Sample Analysis, this analyte fell outside the control limits of 20% RPD. Therefore, the result was qualified.
3. This analyte was qualified because the laboratory performed the MS/MSD Analysis on a field blank.
4. The reported analyte was qualified because the associated Calibration Blank result was greater than the MDL.
5. This analyte is rejected or qualified because the laboratory exceeded the holding time for digestion and analysis.
6. The laboratory subtracted the method blank from the sample result. The reviewer's calculation has added the method blank result to the reported concentration.
7. The photocopy submitted is illegible. Therefore, the QA reviewer cannot read the laboratory's reported concentration result.
8. The reported or nondetected value was qualified because the MS/MSD spike recovery was less than 75 percent.
9. The reported value was qualified because the MS/MSD spike recovery was greater than 125 percent.
10. The reported value was qualified as estimated (J/UJ) but the bias is uncertain due to both high and low MS recoveries.
11. The reported values were qualified because the laboratory duplicate exceeded 20 percent RPD or the absolute difference exceeded the reporting limit for sample results < 4X the reporting limit.
12. The reported value(s) was qualified as estimated (J) because the field duplicate RPD was >30% for SR<5xRL, or the absolute difference was >RL for SR <RL, in which case the reported value(s) were estimated (J) positive and nondetects (UJ).
13. The reported value was qualified because the LCS recovery was less than 80 percent.
14. The reported result was greater than the MDL but less than the RL and qualified (J) as estimated by the laboratory.
15. The reported value was qualified because the LCS recovery was greater than 120 percent.
16. The reported value was qualified because of negative instrument drift.

23. The dissolved result was > the total result and the relative percent difference between the total and dissolved results fell outside the control limits of < 20% for sample results > 4xRL or absolute difference of +/- RL for sample results < 4xRL. Therefore, the results in both the total and dissolved fractions were qualified.
24. The dissolved hexavalent chromium result was > the dissolved chromium result or the total hexavalent chromium result was > the total chromium result and the relative percent difference between the total and dissolved results fell outside the control limits of < 20% for sample results > 4xRL or absolute difference of +/- RL for sample results < 4xRL. Therefore, the results were qualified.

Soil Target Analyte Summary Hit List (Metals)

Site Name PPG Garfield Avenue – Forrest Street Additional Remedial Investigation (GARIS)
Sampling Date June 1, 2015
Lab Name/ID Accutest, Dayton, NJ
SDG No JB95926A
Sample Matrix Soil
Trip Blank ID NA
Field Blank ID FB-20150601

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
EF-73A-0.0-0.5	JB95926-1A	VANADIUM	U	15.5	15.5	5.5		
EF-73A-0.0-0.5	JB95926-1A	CHROMIUM	0.11 J	8.3	8.3	1.1		
EF-73A-0.0-0.5	JB95926-1A	NICKEL	U	16.0	16.0	4.4		
EF-73A-0.0-0.5	JB95926-1A	ANTIMONY	U	0.39	0.39	2.2	Qualify	15,22
EF-73A-10.0-10.5	JB95926-8A	VANADIUM	U	34.8	34.8	6.0		
EF-73A-10.0-10.5	JB95926-8A	CHROMIUM	0.11 J	25.1	25.1	1.2		
EF-73A-10.0-10.5	JB95926-8A	NICKEL	U	13.9	13.9	4.8		
EF-73A-10.0-10.5	JB95926-8A	ANTIMONY	U	U	U	2.4	Qualify	15
EF-73A-10.0-10.5X	JB95926-9A	VANADIUM	U	32.4	32.4	6.3		
EF-73A-10.0-10.5X	JB95926-9A	CHROMIUM	0.11 J	20.6	20.6	1.3		
EF-73A-10.0-10.5X	JB95926-9A	NICKEL	U	13.6	13.6	5.0		
EF-73A-10.0-10.5X	JB95926-9A	ANTIMONY	U	U	U	2.5	Qualify	15
EF-73A-12.0-12.5	JB95926-10A	ANTIMONY	U	U	U	2.5	Qualify	15
EF-73A-12.0-12.5	JB95926-10A	VANADIUM	U	32.3	32.3	6.2		
EF-73A-12.0-12.5	JB95926-10A	CHROMIUM	0.11 J	20.8	20.8	1.2		
EF-73A-12.0-12.5	JB95926-10A	NICKEL	U	14.9	14.9	4.9		
EF-73A-14.0-14.5	JB95926-11A	ANTIMONY	U	U	U	2.3	Qualify	15
EF-73A-14.0-14.5	JB95926-11A	VANADIUM	U	25.0	25.0	5.8		
EF-73A-14.0-14.5	JB95926-11A	CHROMIUM	0.11 J	42.5	42.5	1.2		
EF-73A-14.0-14.5	JB95926-11A	NICKEL	U	12.4	12.4	4.6		
EF-73A-16.0-16.5	JB95926-12A	ANTIMONY	U	U	U	2.2	Qualify	15
EF-73A-16.0-16.5	JB95926-12A	VANADIUM	U	18.8	18.8	5.6		
EF-73A-16.0-16.5	JB95926-12A	CHROMIUM	0.11 J	28.6	28.6	1.1		

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
EF-73A-16.0-16.5	JB95926-12A	NICKEL	U	9.6	9.6	4.5		
EF-73A-18.0-18.5	JB95926-13A	ANTIMONY	U	U	U	2.4	Qualify	15
EF-73A-18.0-18.5	JB95926-13A	VANADIUM	U	20.1	20.1	5.9		
EF-73A-18.0-18.5	JB95926-13A	CHROMIUM	0.11 J	31.5	31.5	1.2		
EF-73A-18.0-18.5	JB95926-13A	NICKEL	U	13.0	13.0	4.7		
EF-73A-2.0-2.5	JB95926-2A	ANTIMONY	U	U	U	2.4	Qualify	15
EF-73A-2.0-2.5	JB95926-2A	VANADIUM	U	26.2	26.2	6.1		
EF-73A-2.0-2.5	JB95926-2A	CHROMIUM	0.11 J	14.2	14.2	1.2		
EF-73A-2.0-2.5	JB95926-2A	NICKEL	U	28.2	28.2	4.9		
EF-73A-4.3-4.5	JB95926-3A	ANTIMONY	U	0.48	0.48	2.1	Qualify	15,22
EF-73A-4.3-4.5	JB95926-3A	VANADIUM	U	21.2	21.2	5.1		
EF-73A-4.3-4.5	JB95926-3A	CHROMIUM	0.11 J	16.8	16.8	1.0		
EF-73A-4.3-4.5	JB95926-3A	NICKEL	U	18.8	18.8	4.1		
EF-73A-6.0-6.5	JB95926-4A	ANTIMONY	U	U	U	2.0	Qualify	15
EF-73A-6.0-6.5	JB95926-4A	VANADIUM	U	22.1	22.1	5.1		
EF-73A-6.0-6.5	JB95926-4A	CHROMIUM	0.11 J	17.1	17.1	1.0		
EF-73A-6.0-6.5	JB95926-4A	NICKEL	U	15.2	15.2	4.1		
EF-73A-8.0-8.5	JB95926-5A	ANTIMONY	U	U	U	2.0	Qualify	15
EF-73A-8.0-8.5	JB95926-5A	VANADIUM	U	18.0	18.0	5.0		
EF-73A-8.0-8.5	JB95926-5A	CHROMIUM	0.11 J	13.3	13.3	0.99		
EF-73A-8.0-8.5	JB95926-5A	NICKEL	U	15.0	15.0	4.0		

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

NJDEP Soil Metals Laboratory Footnotes

- The value reported is less than or equal to 3x the value in the method blank. It is the policy of NJDEP-DPFSR to negate the reported value due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
- The value reported is greater than three (3) but less than ten (10) times the value in the method blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to the method blank contamination. The "B" qualifier alerts the end-user to the presence of this analyte in the method blank.

19. The value reported is less than or equal to 3x the value in the trip/field blank. It is the policy of NJDEP-DPFSR to negate the reported value as due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
20. The value reported is greater than 3x but less than ten (10) the value in the trip/field blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to trip/field blank contamination.
21. The concentration reported by the laboratory is incorrectly calculated.
22. The laboratory failed to report the presence of the analyte in the sample.
23. The reported metal value was qualified because the Calibration Verification Standard was not within the recovery range (90-110 percent).
24. In the MS/MSD Sample Analysis, this analyte fell outside the control limits of 20% RPD. Therefore, the result was qualified.
25. This analyte was qualified because the laboratory performed the MS/MSD Analysis on a field blank.
26. The reported analyte was qualified because the associated Calibration Blank result was greater than the MDL.
27. The reported value was qualified because serial dilution analysis was not within QC limit of 10% D.
28. This analyte is qualified or rejected because the laboratory exceeded the holding time for digestion and analysis.
29. The laboratory subtracted the method blank from the sample result. The reviewer's calculation has added the method blank result to the reported concentration.
30. The photocopy submitted is illegible. Therefore, the QA reviewer cannot read the laboratory's reported concentration result.
31. The reported or nondetected value was qualified because the MS/MSD spike recovery was less than 75 percent.
32. The reported value was qualified because the MS/MSD spike recovery was greater than 125 percent.
33. The reported value was qualified as estimated (J/UJ) but the bias is uncertain due to both high and low MS recoveries.

34. The reported values were qualified because the laboratory duplicate exceeded 35 percent RPD or the absolute difference exceeded the reporting limit for sample results < 5X the reporting limit.
35. The reported value was qualified because the field duplicate exceeded 50 percent RPD for results > 5X the reporting limit.
36. The reported value was qualified because the LCS recovery was less than 80 percent.
37. The reported value was qualified because the sample moisture content was greater than 50 percent.
38. The reported result was greater than the MDL but less than the RL and qualified (J) as estimated by the laboratory.
39. The reported value was qualified because the LCS recovery was greater than 120 percent.
40. The reported value was qualified because of negative instrument drift.
25. The reported value was qualified as estimated (J/UJ) but the bias is uncertain due to either an acceptable MS recovery and high or low MSD recovery, or acceptable MSD recovery and a high or low MS recovery.
26. The reported calculated value was negated since one or both of the values in the calculation were negated.

Aqueous Target Analyte Summary Hit List (Metals)

Site Name PPG Garfield Avenue – Forrest Street Additional Remedial Investigation (GARIS)
Sampling Date June 1, 2015
Lab Name/ID Accutest, Dayton, NJ
SDG No JB95926A
Sample Matrix Soil
Trip Blank ID NA
Field Blank ID FB-20150601

Field Sample ID	Lab Sample ID	Analyte	Method Blank (µg/l)	Laboratory Sample Result (µg/l)	Validation Sample Result (µg/l)	RL (µg/l)	Quality Assurance Decision	NJDEP Validation Footnote
EF-73A-GWF-10.0-14.0	JB95926-6A	CHROMIUM	-0.1	1.0	1.0	10	Qualify	21,23
EF-73A-GWF-20.0-24.0	JB95926-15A	CHROMIUM	-0.1	16500	16500	10		
EF-73A-GWU-10.0-14.0	JB95926-7A	CHROMIUM	-0.1	1710	1710	20	Qualify	15
EF-73A-GWU-20.0-24.0	JB95926-14A	CHROMIUM	-0.1	12500	12500	50	Qualify	15

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

Aqueous Metals NJDEP Laboratory Footnotes

1. The value reported is less than or equal to 3x the value in the method blank. It is the policy of NJDEP-DPFSR to negate the reported value due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
2. The value reported is greater than three (3) but less than ten (10) times the value in the method blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to the method blank contamination. The "B" qualifier alerts the end-user to the presence of this analyte in the method blank.
3. The value reported is less than or equal to 3x the value in the trip/field blank. It is the policy of NJDEP-DPFSR to negate the reported value as due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
4. The value reported is greater than 3x but less than ten (10) the value in the trip/field blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to trip/field blank contamination.

5. The concentration reported by the laboratory is incorrectly calculated.
6. The laboratory failed to report the presence of the analyte in the sample.
7. The reported metal value was qualified because the Calibration Verification Standard was not within the recovery range (90-110 percent).
8. In the MS/MSD Sample Analysis, this analyte fell outside the control limits of 20% RPD. Therefore, the result was qualified.
9. This analyte was qualified because the laboratory performed the MS/MSD Analysis on a field blank.
10. The reported analyte was qualified because the associated Calibration Blank result was greater than the MDL.
11. The reported value was qualified because serial dilution analysis was not within QC limit of 10% D.
12. This analyte is rejected or qualified because the laboratory exceeded the holding time for digestion and analysis.
13. The laboratory subtracted the method blank from the sample result. The reviewer's calculation has added the method blank result to the reported concentration.
14. The photocopy submitted is illegible. Therefore, the QA reviewer cannot read the laboratory's reported concentration result.
15. The reported or nondetected value was qualified because the MS/MSD spike recovery was less than 75 percent for metals or less than 90% for wet chem.
16. The reported value was qualified because the MS/MSD spike recovery was greater than 125 percent for metals or greater than 110% for wet chem.
17. The reported value was qualified as estimated (J/UJ) but the bias is uncertain due to both high and low MS recoveries.
18. The reported values were qualified because the laboratory duplicate exceeded 20 percent RPD or the absolute difference exceeded the reporting limit for sample results < 5X the reporting limit.
19. The reported value was qualified because the field duplicate exceeded 30 percent RPD for results > 5X the reporting limit.
20. The reported value was qualified because the LCS recovery was less than 80 percent.

21. The reported result was greater than the MDL but less than the RL and qualified (J) as estimated by the laboratory.
22. The reported value was qualified because the LCS recovery was greater than 120 percent.
23. The reported value was qualified because of negative instrument drift.

Attachment B

Data Validation Report Form

Client Name: PPG Industries	Project Number: 60314351.GA.DE.PDI.P3
Site Location: PPG Garfield Avenue – Forrest Street Additional Remedial Investigation (GARIS)	Project Manager: Bill Spronz
Laboratory: Accutest, Dayton, NJ	Type of Validation: Full
Laboratory Job No: JB95926_R	Date Checked: 7/8/2015
Validator: Justin Webster	Peer: Lisa Krowitz

ITEM	YES	NO	N/A	COMMENTS
Sample results included?	X			
Reporting Limits met project requirements?	X			
Field I.D. included?	X			
Laboratory I.D. included?	X			
Sample matrix included?	X			
Sample receipt temperature 2-6°C?	X			
Signed COCs included?	X			
Date of sample collection included?	X			
Date of sample digestion included?	X			
Holding time to digestion met criteria? (Soils -30 days from collection to digestion.)	X			
Date of analysis included?	X			
Holding time to analysis met criteria? (Soils -168 hours from digestion to analysis; Aqueous - 24 hours from collection to analysis.)	X			
Method reference included?	X			
Laboratory Case Narrative included?	X			

Definitions: MDL Method Detection Limit; %R Percent Recovery; RL Reporting Limit; RPD Relative Percent Difference; RSD Relative Standard Deviation :Corr Correlation Coefficient.

ITEM	YES	NO	N/A	COMMENTS
Initial calibration documentation included in lab package?	X			
1) Blank plus 4 standards (7196A) or blank plus 3 standards (7199)	X			
2) Correlation coefficient of =0.995 (7196A) or =0.999 (7199)	X			
3) Calibrate daily or each time instrument is set up.	X			
Calibration Check Standard (CCS) for 7196A and Quality Control Sample (QCS) for 7199 Included in Lab Package?	X			
1) %R criteria met? (90 - 110%)	X			
2) Correct frequency of one per every 10 samples	X			
3) CCS and QCS from independent source and at mid-level of calibration curve	X			
Calibration Blanks	X			
1) Analyzed prior to initial calibration standards and after each CCS/QCS?	X			
2) Absolute value should not exceed MDL.	X			
Method Blank, Field Blanks and/or Equipment Blanks Included in Lab Package?	X			
1) Method blank analyzed with each preparation batch?	X			
2) Absolute value should not exceed MDL.	X			
Eh and pH Data	X			
1) Eh and pH data was included and plotted for all samples?	X			
Soluble Matrix Spike Data Included in Lab Package?	X			
1) Soluble Matrix %R criteria met? (75-125%R).		X		See nonconformance table
2) Was the spike concentration 40 mg/Kg or twice the sample concentration?	X			
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	X			
Insoluble Matrix Spike Data Included in Lab Package?	X			
1) Insoluble Matrix %R criteria met? (75-125%R).	X			
2) Was the spike concentration around 400 to 800 mg/Kg?	X			
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	X			

ITEM	YES	NO	N/A	COMMENTS
Post Digestion Spike	X			
1) Post Digestion Spike %R criteria met? (85-115%R).	X			
2) Was the spike concentration 40 mg/Kg or twice the sample concentration?	X			
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	X			
Sample Duplicate Data Included in Lab Package?	X			
1) RPD criteria met? (RPD ≤ 20%) if both results are ≤4x RL or absolute difference ≤ RL if either or both results are <4xRL	X			
2) Was a sample duplicate analyzed at the frequency of 1 per batch or 20 samples?	X			
Was a Laboratory Control Sample (LCS) Included in Lab Package?	X			
1) %R criteria met? (80-120%R).	X			
2) Was an LCS analyzed at the frequency of 1/batch or 20 samples?	X			
Were any Field Duplicate samples submitted with this SDG?	X			JB95926-8/9
1) Were Field duplicate RPD criteria met? (RPD≤50% for both sample results >5xRL or professional judgement if either or both results are <5xRL.	X			
Were all sample quantitation and reporting requirements met?	X			
1) Were all solid samples reported with percent solids > 50%?	X			
2) Were any samples analyzed or reported with dilutions?	X			
Miscellaneous Items	X			
1) For soils by 7196A, was the pH within a range of 7.0-8.0?	X			
2) For soils by 7199, was the pH within a range of 9.0-9.5?			X	
3) For aqueous by 7196A, was the pH with a range of 1.5-2.5?	X			
4) For soils (3060A), was the digestion temperature 90-95C for at least 60 minutes?	X			
5) For 7199, was each sample injected twice and was the RPD =20?			X	

SDG#: JB95926/ Method 7196A

Batch: GN27135

Cr+6 ICAL 6/14/2015

Soil

(p. 73 of data pkg)

x - concentration	y - response
0	0
0.01	0.009
0.05	0.045
0.1	0.088
0.3	0.254
0.5	0.426
0.8	0.667
1	0.834

(p. 73 of data pkg)

AECOM Calculated Offset	0.0030	OK	Reported Offset	0.0030
AECOM Slope	0.8329	OK	Reported Slope	0.8329
AECOM Calculated r	0.99995	OK	Reported r	0.99995

LCS calculation

GP89771-B1 P.49,73

Background Absorbance	0
Total absorbance	0.798
Total absorbance - background	0.798
Instrument Concentration	0.954
Sample weight (mg/kg)	0.0025
Final Volume (L)	0.1
Dilution Factor	1

AECOM Calculated LCS Result (mg/Kg)	38.2	OK	Reported Result (mg/Kg)	38.2
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%R = Found/True*100

GP89771-B1 P.49,73

True Value (mg/kg)	40
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AECOM Calculated %R	95.4	OK rounding	Reported %R	96
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MS calculation

GP89771-S1 P.51,73

Background reading	0.003
Total absorbance	0.621
Total absorbance - background	0.618
Instrument Concentration	0.7384
Sample weight (mg/kg)	0.00254
Final Volume (L)	0.1
Percent solids	0.794
Dilution Factor	1

AECOM Calculated MS Result (mg/Kg)	36.6	OK	Reported Result (mg/Kg)	37
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%R = Found/True*100

GP89771-S1 P.51,73

True Value (mg/kg)	49.6
Native concentration (mg/Kg)	0

AECOM%R	73.8	OK rounding	Reported %R	73.8
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Percent Solids

P.52

EF-73A-8.0-8.5

Empty dish weight=	27.02
Wet weight=	36.67
Dry weight=	34.68

AECOM%solids =	79.4	OK	Reported %solids=	79.4
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Reporting Limit		P.14	EF-73A-8.0-8.5
Low Standard	0.01		
Initial weight (mg/kg)	0.00245		
Final volume (L)	0.1		
Percent solids	0.794		
Dilution Factor	1		
Reporting Limit	0.51	OK rounding	Reported RL (mg/Kg)= 0.50

Sample Calculations		P.22, 71	EF-73A-18.0-18.5
Background reading	0.001		
Total absorbance	0.139		
Total absorbance - background	0.138		
Instrument Response	0.162		
Sample weight (mg/kg)	0.00252		
Final Volume (L)	0.1		
Percent solids	0.851		
Dilution Factor	1		
AECOM Calculated Result (mg/Kg)	7.6	OK	Reported Result (mg/Kg) 7.6

SDG#: JB95926/ Method 7196A

Batch: GN26400

Cr+6 ICAL 6/1/2015

Aqueous

(p. 55 of data pkg)

x - concentration	y - response
0	0
0.01	0.01
0.05	0.046
0.1	0.091
0.3	0.272
0.5	0.445
0.8	0.699
1	0.897

(p. 55 of data pkg)

AECOM Calculated Offset	0.0014	OK	Reported Offset	0.0014
AECOM Slope	0.8873	OK	Reported Slope	0.8873
AECOM Calculated r	0.99985	OK	Reported r	0.99985

LCS calculation

GP26400-B1 P.49,55

Background Absorbance	0
Total absorbance	0.139
Total absorbance - background	0.139
Instrument Concentration	0.155
Dilution Factor	1

AECOM Calculated LCS Result (mg/L)	0.16	OK	Reported Result (mg/L)	0.16
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%R = Found/True*100

GP26400-B1 P.49,55

True Value (mg/L)	0.15
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AECOM Calculated %R	103.4	OK rounding	Reported %R	107
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MS calculation

GN26400-S3 P.51,53

Background reading	0
Total absorbance	0.302
Total absorbance - background	0.302
Instrument Concentration	0.3388
Dilution Factor	100

AECOM Calculated MS Result (mg/L)	33.88	OK	Reported Result (mg/L)	33.88
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%R = Found/True*100

GN26400-S3 P.51,53

True Value (mg/L)	23.354
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Native concentration (mg/L)	11.7
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AECOM %R	95.0	OK rounding	Reported %R	95.1
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Reporting Limit

P.25 EF-73A-GWF-20.0-24.0

Low Standard	0.01
Dilution Factor	100

Reporting Limit	1.00	OK	Reported RL (mg/L)=	1.00
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Sample Calculations

P.25, 55 EF-73A-GWF-20.0-24.0

Background reading	0
Total absorbance	0.105
Total absorbance - background	0.105
Instrument Response	0.117
Dilution Factor	100

AECOM Calculated Result (mg/L)	11.7	OK	Reported Result (mg/L)	11.7
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Nonconformance Tables**Matrix Spikes**

Sample ID	Lab ID	Analyte	Matrix Spike	% Recovery	Lower Limit	Upper Limit
EF-73A-8.0-8.5	JB95926-5	CHROMIUM (HEXAVALENT)	Soluble	73.8	75	125
EF-73A-8.0-8.5	JB95926-5	CHROMIUM (HEXAVALENT)	Insoluble	101	75	125
EF-73A-8.0-8.5	JB95926-5R	CHROMIUM (HEXAVALENT)	Soluble	74.9	75	125
EF-73A-8.0-8.5	JB95926-5R	CHROMIUM (HEXAVALENT)	Insoluble	100.4	75	125
EF-73A-8.0-8.5	JB95926-5R	CHROMIUM (HEXAVALENT)	Reanalysis PDS	83	85	115
EF-73A-8.0-8.5	JB95926-5R	CHROMIUM (HEXAVALENT)	pH Adj Reanalysis PDS	111	85	115
EF-73A-GWU-20.0-24.0	JB95926-14	CHROMIUM (HEXAVALENT)	PDS	95.7	85	115
EF-73A-GWF-20.0-24.0	JB95926-15	CHROMIUM (HEXAVALENT)	PDS	95.1	85	115

Field Duplicate

Analyte	EF-73A-10.0-10.5 mg/kg	RL mg/kg	EF-73A-10.0-10.5X mg/kg	RL mg/kg	RPD (%)	Actions	Associated Samples
Hexavalent Chromium	0.6	0.49	0.52	0.49	14.3%	None	JB95926
Hexavalent Chromium	1.4	0.49	0.95	0.49	38.3%	None	JB95926R

Client Name: PPG Industries	Project Number: 60279173.GA.RI.RPT.FOR
Site Location: PPG Garfield Avenue – Forrest Street Additional Remedial Investigation (GARIS)	Project Manager: Bill Spronz
Laboratory: Accutest, Dayton, NJ	Type of Validation: Limited
Laboratory Job No: JB95926A	Date Checked: 7/8/2015
Validator: Justin Webster	Peer: Lisa Krowitz

ITEM	YES	NO	N/A	COMMENTS
Sample results included?	X			
Reporting Limits met project requirements?	X			
Field I.D. included?	X			
Laboratory I.D. included?	X			
Sample matrix included?	X			
Sample receipt temperature 2-6C?	X			
Signed COCs included?	X			
Date of sample collection included?	X			
Date of sample digestion included?	X			
Date of analysis included?	X			
Holding time met QC criteria? (Aqueous – 28 days HCl to pH < 2, Cool, ≤ 6 °C)	X			
Method reference included?	X			
Laboratory Case Narrative included?	X			

Definitions: MDL - Method Detection Limit; %R - Percent Recovery; RL - Reporting Limit; RPD - Relative Percent Difference; RSD - Relative Standard Deviation ;Corr - Correlation Coefficient.

ITEM	YES	NO	N/A	COMMENTS
Sample dilutions?		X		
Initial calibration documentation included in lab package?			X	N/A for Limited Validation
1) Calibrate daily or each time instrument is set up.			X	
2) ICP (6010) -Blank plus 1 standard? If no, reject (R) data.			X	
3) Hg (7470/7471) -Blank plus 5 standards? If no, reject (R) data.			X	
Initial Calibration Verification Standard (ICV) for ICP (6010) and Initial Calibration Check Standard (ICCS) for Hg (7470/7471) included in lab package?			X	N/A for Limited Validation
1) Analyzed immediately after initial calibration? If no, reject (R) data.			X	
2) %R criteria met? (90-110%). If no, J positive results for affected analyte(s) if %R between 80-89% and 111-120% and indicate bias; UJ non-detect results for affected analyte(s) if %R between 80-89%, and R all data for affected analyte(s) if %R <80% or >120%.			X	
3) Spot check ICV/ICCS results for several analytes.			X	
Continuing Calibration Verification Standard (CCV) for ICP (6010) and Calibration Check Standard (CCS) for Hg (7470/7471) included in Lab Package?			X	N/A for Limited Validation
1) Analyzed immediately after each ICV/ICC/CB and after every 10 samples? If no, reject (R) data.			X	
2) CCS and CCV from independent source and at mid-level of calibration curve. If no, reject (R) data.			X	
3) %R criteria met? (90-110%R). If no, J positive results for affected analyte(s) if %R between 80-89% and 111-120% and indicate bias; UJ non-detect results for affected analyte(s) if %R between 80-89% and R all data for affected analyte(s) if %R <80% or >120%.			X	
4) Spot check CCV/CCS results for several analytes.			X	
Low Calibration Standard (CRI) included in Lab Package?			X	N/A for Limited Validation
1) %R criteria met? - 50-150% for Co, Mn, Zn, by ICP-MS; Pb, Tl by 6010; 70-130% all others. If no, refer to ILM05.4 NJ SOP 5.A.2 for actions.			X	

ITEM	YES	NO	N/A	COMMENTS
Calibration Blanks			X	N/A for Limited Validation
1) Analyzed after daily calibration and after each ICV/ICC/CCV/CCS and after every 10 samples? If no, reject (R) data.			X	
2) Absolute value <3xIDL? If no, -if sample result <10x CB result, qualify affected analyte(s) in associated samples with CB; -if sample result >10xCB result, no qualification.			X	
Method Blank Included in Lab Package?	X			
1) Method blank analyzed with each preparation batch or every SDG, or 1/20 samples? If no, reject (R) data, except no aqueous MB required for FB/EB if only soil samples were analyzed.	X			
2) Method blank analyzed 1/20 samples? If - MB 1/25, J sample results from 21-25; -MB >1/25, R sample results after 25th sample.	X			
3) MB results nondetect? If no, -sample result <3xMB, negate UB; -sample result>3xMB but <10xMB, JB; -sample result >10xMB, no qualification.		X		See nonconformance table
4) Negative MB result reported? If yes, -Positive sample result<10xMB, qualify estimated, biased low (J); -Non-detect sample result, qualify UJ, may be false non-detect.	X			See nonconformance table
Field Blanks/Equipment Blanks Included in Lab Package?	X			
1) FB/EB result non-detect? If no, -sample result <3xFB/EB, negate U; -sample result>3xFB/EB but <10xMB, J; -sample result >10xFB/EB, no qualification.	X			
Interference Check Standards (ICSA and ICSB) included in Lab Package?	X			
1) Analyzed at beginning of analytical run? If no, reject (R) data.	X			
2) %R criteria met? (80-120%) If no, %R>120%, no qualification if sample result non-detect; %R between 121-150%, J positive results, biased high; %R between 50-79%, J/UJ results, biased low; %R<50% or >150%, reject (R) result	X			
3) Spot check accuracy of %Rs	X			

ITEM	YES	NO	N/A	COMMENTS
Matrix Spike/Matrix Spike Duplicate Data Included in Lab Package?	X			
1) MS/MSD %R (75-125%R) and RPD (+20% aq or 35% soils for SR \geq 5xRL or absolute difference <RL for SR<5xRL) criteria met? - %R>125% J positive results for affected analyte(s) for all samples in the same batch, accept NDs; -%R<75% J/UJ for affected analyte(s) for all samples in the same batch; - RPD outside limits J positive results for affected analyte(s) for all samples in the same batch/SDG, accept NDs. If absolute difference >RL for SR<5xRL estimate positive results and nondetects for affected analyte(s) for all samples in the same batch. For Hg same as above except Abs Diff between MS and MSD must be \leq 2xRL.		X		See nonconformance table
2) Was a sample spiked at the frequency of 1/batch or 20 samples?	X			
3) Was the MS performed on a site sample?	X			EF-73A-GWU-20.0-24.0, EF-73A-GWF-20.0-24.0, and EF-73A-8.0-8.5
4) Was the MS performed on a FB/EB or TB? If yes, J all sample data.		X		
Post Digestion Spike		X		
1) %R criteria met? (80-120%R) - %R>120% J positive results for affected analyte(s) for all samples in the same batch/SDG, accept NDs. - %R<80% J/UJ affected analyte(s) for all samples in the same batch.			X	
2) Was the spike performed on a FB/EB or TB? If yes, J all sample data.			X	
3) Was a sample spiked at the frequency of 1/batch or 20 samples?			X	
Laboratory Duplicate Data Included in Lab Package?	X			MS/MSD
Aqueous - If RPD is >35% for SR \leq 5xRL estimate (J) results.- If absolute difference is >RL for SR <RL estimate (J) positive and nondetects (UJ).- For Hg – Aq \leq 20%,	X			
Soil -- If RPD is >50% for SR \leq 5xRL estimate (J) results.- If absolute difference is >RL for SR <RL estimate (J) positive and nondetects (UJ).- For Hg Soil/Sediment \leq 35%,	X			

ITEM	YES	NO	N/A	COMMENTS
Was a Laboratory Control Sample (LCS) Included in Lab Package?	X			
1) LCS %R criteria met? (80-120%R or within vendor limits). If no, J/UJ all affected analytes(s) for all samples in the same batch/SDG.	X			
2) Was an LCS analyzed at the frequency of 1/batch or 20 samples? If no, J/UJ affected analyte(s) for all samples in the same batch/SDG.	X			
Serial Dilution	X			
1) %D (<10%R) criteria met? - If analyte concentration >10xRL and %D >10% J positive results for affected analyte(s) for all samples in the same batch, accept NDs.		X		See Nonconformance Table
2) Was the frequency 1/batch or 20 samples?	X			
3) Was a site sample used?	X			
4) Was a FB/EB or TB used? If yes, J all sample data.		X		
5) Spot check accuracy of %Ds.	X			
Field Duplicate Data included in Lab Package?	X			
Aqueous - If RPD is >30% for SR≤5xRL estimate (J) results.- If absolute difference is >RL for SR <RL estimate (J) positive and nondetects (UJ).-			X	
Soil -- If RPD is >50% for SR≤5xRL estimate (J) results.- If absolute difference is >RL for SR <RL estimate (J) positive and nondetects (UJ).-	X			See nonconformance table
Percent Solids data included in Lab Package?	X			
1) %Solids criteria (Reg 2 criteria) met? (≥50%)	X			

Nonconformance Tables**Blanks****Batch MP87035**

Analyte	Result	3x	10x	Actions	Associated Samples
Soil Method Blank	mg/kg	mg/kg	mg/kg		
Chromium	0.11	0.33	1.1	None, all results > 10x	All soil samples
Thallium	-0.08	-0.24	-0.8	None, absolute value < RL	

Batch MP87002

Analyte	Result	3x	10x	Actions	Associated Samples
Soil Method Blank	mg/kg	mg/kg	mg/kg		
Chromium	-0.1	-0.3	-1	None, absolute value < RL	All aqueous samples

Matrix Spike/Matrix Spike Duplicate**Batch MP86840**

Analyte	MS	MSD	RPD	Actions	Associated Samples
	mg/kg	mg/kg	mg/kg		
Chromium	54	56	1.1	Estimate bias low	EF-73A-GWU-20.0-24.0

Batch MP7035

Analyte	MS	MSD	RPD	Actions	Associated Samples
	mg/kg	mg/kg	mg/kg		
Antimony	41	42.2	2.8	Estimate bias low	All soils collected in this SDG

Serial Dilution**Batch MP87002**

Analyte	Original	5x dilution	% DIF	Actions	Associated Samples
	mg/kg	mg/kg	mg/kg		
Chromium	2500	2780	11.4	Estimate bias low	EF-73A-GWU-20.0-24.0

Field Duplicate

Analyte	EF-73A-10.0-10.5 mg/kg	RL mg/kg	EF-73A-10.0-10.5X mg/kg	RL mg/kg	RPD (%)	Actions	Associated Samples
Antimony	0.37 U	2.4	0.39 U	2.5	NC	None	All soils collected in this SDG
Chromium	25.1	1.2	20.6	1.3	19.7%	None	
Nickel	13.9	4.8	13.6	5	2.2%	None	
Thallium	0.23 U	1.2	0.24 U	1.3	NC	None	
Vanadium	34.8	6	32.4	6.3	7.1%	None	

Note:

NC - Not Calculated

Data Validation Report

Project:	PPG Garfield Avenue – Forrest Street Additional Remedial Investigation (GARIS)	
Laboratory:	Accutest, Dayton, NJ	
Laboratory Job No.:	JB96034, JB96034A	
Analysis/Method:	Hexavalent Chromium SW846 3060A/7196 Select Metals SW846 3050B/6010C	
Validation Level:	Full (Hexavalent Chromium) Limited (Select Metals)	
Site Location/Address:	90 & 98 Forrest Street Jersey City, NJ	
AECOM Project No:	60279173.GA.RI.RPT.FOR	
Prepared by:	Justin Webster /AECOM	Completed on: 7/9/2015
Reviewed by:	Lisa Krowitz/AECOM	File Name: JB96034_A_R_2015_7_9_DV Report-F

Introduction

The data were reviewed in accordance with the FSP-QAPP and the following NJDEP guidance documents and validation Standard Operating Procedures (SOP):

- NJDEP Office of Data Quality SOP 5.A.10, Rev 3 (September 2009), SOP for Analytical Data Validation of Hexavalent Chromium - for USEPA SW-846 Method 3060A, and USEPA SW-846 Method 7196A;
- NJDEP Office of Data Quality SOP 5.A.16, Rev 1 (May 2002), Quality Assurance Data Validation of Analytical Deliverables for Inorganics (based on USEPA SW-846 Methods)
- Data Quality Assessment and Data Usability Evaluation Technical Guidance, version 1.0, April 2014;
- Data of Known Quality Protocols Technical Guidance, version 1.0, April 2014;

The results of quality control data analyzed with site samples were used to assess the overall reliability of the data. The following qualifiers were used to identify data quality issues

- U: Indicates the analyte was not detected in the sample above the sample reporting limit.
- J: Indicates the result was an estimated value; the associated numerical value was an approximate concentration of the analyte in the sample.

- UJ: Indicates the analyte was not detected above the reporting limit and the reporting limit was approximate.
- UB: The analyte concentration is less than or equal to three (3) times the concentration in the associated method/prep blank. The presence of the analyte in the sample is negated (UB) due to laboratory contamination.
- JB: The analyte concentration is greater than three (3) times, but less than or equal to ten (10) times the concentration in the associated method/prep blank. The presence of that analyte in the sample is considered "real". The concentration is quantitatively qualified (JB) due to method blank contamination.
- R: The sample result was rejected due to serious deficiencies; the presence or absence of the analyte could not be confirmed.
- RA: The sample result was rejected but is still considered usable.

Sample Information

The samples listed below were collected by AECOM on June 2, 2015 as part of the PPG Garfield Avenue – Forrest Street Additional Remedial Investigation (GARIS) sampling at 90 & 98 Forrest Street Jersey City, NJ. Only the samples and parameters listed below were validated.

Field ID	Laboratory ID	Matrix	Fraction
FB-20150602 (Field Blank)	JB96034-1,1A	Aqueous	Hexavalent Chromium, Total Chromium
EF-73A-20.0-20.5	JB96034-2,2A	Soil	Hexavalent Chromium, Select Metals
EF-73A-22.0-22.5	JB96034-3,3A	Soil	Hexavalent Chromium, Select Metals
EF-73A-24.0-24.5	JB96034-4,4A	Soil	Hexavalent Chromium, Select Metals
EF-73A-26.0-26.5	JB96034-5,5A	Soil	Hexavalent Chromium, Select Metals
EF-73S-28.0-28.5	JB96034-6,6A	Soil	Hexavalent Chromium, Select Metals
EF-73A-GWF-30.0-34.0 (Filtered)	JB96034-7,7A	Aqueous	Hexavalent Chromium, Total Chromium
EF-73A-GWU-30.0-34.0 (Unfiltered)	JB96034-8,8A	Aqueous	Hexavalent Chromium, Total Chromium
EF-73A-30.0-30.5	JB96034-9,9A	Soil	Hexavalent Chromium, Select Metals
EF-73A-32.0-32.5	JB96034-10,10A	Soil	Hexavalent Chromium, Select Metals
EF-73A-34.0-34.5	JB96034-11,11A	Soil	Hexavalent Chromium, Select Metals
EF-73A-36.0-36.5	JB96034-12,12A	Soil	Hexavalent Chromium, Select Metals
EF-73A-38.0-38.5	JB96034-13,13A	Soil	Hexavalent Chromium, Select Metals
EF-73A-39.5-40.0	JB96034-14,14A	Soil	Hexavalent Chromium, Select Metals
EF-73A-GWU-40.0-44.0 (Unfiltered)	JB96034-15,15A	Aqueous	Hexavalent Chromium, Total Chromium
EF-73A-GWF-40.0-44.0 (Filtered)	JB96034-16F,16A	Aqueous	Hexavalent Chromium, Total Chromium
FS22-0.0-0.5	JB96034-17,17A	Soil	Hexavalent Chromium, Select Metals
FS22-0.0-0.5X (Field duplicate of FS22-0.0-0.5)	JB96034-18,18A	Soil	Hexavalent Chromium, Select Metals
FS22-2.0-2.5	JB96034-19,19A	Soil	Hexavalent Chromium, Select Metals
FS22-6.0-6.5	JB96034-20,20A	Soil	Hexavalent Chromium, Select Metals
FS22-8.0-8.5	JB96034-21,21A	Soil	Hexavalent Chromium, Select Metals
FS22-GWF-10.0-14.0 (Filtered)	JB96034-22,22A	Aqueous	Hexavalent Chromium, Total Chromium

Field ID	Laboratory ID	Matrix	Fraction
FS22-GWU-10.0-14.0 (Unfiltered)	JB96034-23,23A	Aqueous	Hexavalent Chromium, Total Chromium

The samples were collected following the procedures detailed in the Forrest Street Additional Remedial Investigation Work Plan dated April 27, 2015

General Comments

The data package was complete. Quality control (QC) issues identified during validation are discussed below. Refer to the Target Analyte Summary Hit(s) in Attachment A for a listing of all detected results, qualified results, and associated qualifications, where applicable. The nonconformances for each section discussed below are presented in Attachment B.

Hexavalent Chromium

MS Results

Soil

Soil sample EF-73A-20.0-20.5 (JB96034-2) was selected for the soil matrix spike (MS) analysis and was used for supporting data quality recommendations. The soluble and insoluble MS recoveries (%Rs) from the initial batch were 95.4% and 97.7%, respectively which met the quality control (QC) criteria of 75-125%R. The post digestion spike (PDS) recovery was 99%, which met the PDS criteria of 85-115%. No qualifications were required based on the soil MS criteria.

Groundwater

Unfiltered sample FS22-GWU-10.0-14.0 (JB96034-23) was used as a source sample for the MS analysis in this SDG. The initial MS recovery was 104.7% which met the QC requirements of 75-125%R. No data qualification was necessary on this basis.

Filtered sample FS22-GWF-10.0-14.0 (JB96034-22) was also selected as a source sample for the MS analysis in this SDG. The initial MS recovery was 100.0% which met the QC requirements of 75-125%R. No data qualification was necessary on this basis.

Filtered sample EF-73A-GWF-40.0-44.0 (JB96034-16F) was also selected as a source sample for the MS analysis in this SDG. The initial MS recovery was 101.3% which met the QC requirements of 75-125%R. No data qualification was necessary on this basis.

Field Duplicate Results

Samples FS22-0.0-0.5 and FS22-0.0-0.5X were collected as the field duplicate (FD) pair in this SDG. Hexavalent chromium met the precision criteria of \pm RL for sample results \leq 5xRL.

Sample Results

The concentration of total chromium was compared to the concentration of hexavalent chromium to ensure that the total chromium concentration was greater than the hexavalent chromium concentration. No data were qualified on this basis.

Hexavalent chromium results (flagged B by the laboratory) that were less than the RL, but greater than or equal to the method detection limit (MDL) are approximate values and have been qualified as estimated (J).

TAL Metals

Method Blank

Negative instrument drift was detected for nickel and thallium in the MB associated with the soils samples collected in SDG. Since the absolute value of the negative instrument drift was less than the respectful reporting limits for nickel, no data were qualified on this basis. All the thallium results were qualified as estimated (J/UJ) with a potential low bias due to negative instrument drift,

Matrix Spike/Matrix Spike Duplicate (MS/MSD)

Site sample EF-73A-20.0-20.5 (JB96034-2A) was used for the MS/MSD analysis in association with the soil samples collected in this SDG. The MS and MSD met applicable QC requirements.

Site sample FS22-GWU-10.0-14.0 (JB96034-23A) was used for the MS/MSD analysis in association with the unfiltered aqueous samples collected in this SDG. The MS and MSD for chromium met applicable QC requirements; therefore, filtered aqueous results were acceptable as submitted by the laboratory.

Site sample FS22-GWF-10.0-14.0 (JB96034-22A) was used for the MS/MSD analysis in association with the filtered aqueous samples collected in this SDG. The MS and MSD for chromium met applicable QC requirements; therefore, filtered aqueous results were acceptable as submitted by the laboratory.

Field Duplicate Results

Samples FS22-0.0-0.5 and FS22-0.0-0.5X were collected as the field duplicate pair in this SDG. All precision QC requirements were met. No data qualifications were necessary on this behalf.

Sample Results

Metals results (flagged B by the laboratory) that were less than the RL, but greater than or equal to the MDL are approximate values and have been qualified as estimated (J).

Serial Dilution

Site sample EF-73A-20.0-20.5 was selected by the laboratory for the serial dilution analysis. Antimony and nickel percent differences exceeded less than 10 percent; however, since the initial sample concentrations for antimony and nickel were less than 10 times the RL no data qualifications were necessary.

Data Quality and Usability

In general, these data appear to be valid and may be used for decision-making purposes. No data were rejected. Qualified results are presented in Attachments A and B.

Sample results reported between the MDL and RL are usable as estimated values with an unknown directional bias.

ATTACHMENTS

Attachment A: Target Analyte Summary Hitlist(s)

Attachment B: Data Validation Report Form

Attachment A

Target Analyte Summary Hitlist(s)

Soil Target Analyte Summary Hit List Hexavalent Chromium

Site Name PPG Garfield Avenue – Forrest Street Additional Remedial Investigation (GARIS)
Sampling Date June 2, 2015
Lab Name/ID Accutest, Dayton, NJ
SDG No JB96034
Sample Matrix Soil
Trip Blank ID NA
Field Blank ID FB-20150602

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
EF-73A-32.0-32.5	JB96034-10	CHROMIUM (HEXAVALENT)	U	14.5	14.5	0.47		
EF-73A-34.0-34.5	JB96034-11	CHROMIUM (HEXAVALENT)	U	0.40	0.40	0.48	Qualify	31
FS22-0.0-0.5	JB96034-17	CHROMIUM (HEXAVALENT)	U	0.32	0.32	0.45	Qualify	31
FS22-0.0-0.5X	JB96034-18	CHROMIUM (HEXAVALENT)	U	0.39	0.39	0.45	Qualify	31
FS22-2.0-2.5	JB96034-19	CHROMIUM (HEXAVALENT)	U	0.57	0.57	0.52		
EF-73A-20.0-20.5	JB96034-2	CHROMIUM (HEXAVALENT)	U	7.7	7.7	0.49		
FS22-8.0-8.5	JB96034-21	CHROMIUM (HEXAVALENT)	U	0.36	0.36	0.50	Qualify	31
EF-73A-22.0-22.5	JB96034-3	CHROMIUM (HEXAVALENT)	U	14.8	14.8	0.51		
EF-73A-24.0-24.5	JB96034-4	CHROMIUM (HEXAVALENT)	U	27.7	27.7	0.44		
EF-73A-26.0-26.5	JB96034-5	CHROMIUM (HEXAVALENT)	U	38.9	38.9	0.45		
EF-73S-28.0-28.5	JB96034-6	CHROMIUM (HEXAVALENT)	U	148	148	2.2		
EF-73A-30.0-30.5	JB96034-9	CHROMIUM (HEXAVALENT)	U	118	118	2.5		

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

NJDEP Soil Hexavalent Chromium Laboratory Footnote

1. The value reported is less than or equal to 3x the value in the preparation/reagent blank. It is the policy of NJDEP-DPFSR to negate the reported value due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.

2. The value reported is greater than three (3) times but less than ten (10) times the value in the preparation/reagent blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to the preparation/reagent blank contamination. The "B" qualifier alerts the end-user to the presence of this analyte in the preparation/reagent blank.
3. The value reported is less than or equal to three (3) times the value in the trip/field blank. It is the policy of NJDEP-DPF SR to negate the reported value as due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
4. The value reported is greater than three (3) times but less than ten (10) times the value in the trip/field blanks and is considered "real". However, the reported value must be quantitatively qualified "J" due to trip/field blank contamination.
5. The concentration reported by the laboratory is incorrectly calculated.
6. The laboratory failed to report the presence of the analyte in the sample.
7. The reported Hexavalent Chromium value was qualified because the Calibration Check Standard was not within the recovery range (90-110 percent).
8. In the Duplicate Sample Analysis, Hexavalent Chromium fell outside the control limits of ≤ 20 percent for sample results $> 4xRL$ or $+ RL$ for sample results $< 4xRL$. Therefore, the result was qualified.
9. This analyte was rejected because the laboratory performed the Duplicate Analysis on a field blank.
10. The reported value was qualified because the PVS recovery was greater than 115 percent.
11. The reported value was qualified because the PVS recovery was less than 85 percent.
12. The non-detected value was qualified (UJ) because the PVS recovery was less than 85 percent. The possibility of a false negative exists.
13. The reported analyte was qualified because the associated Calibration Blank result was greater than the MDL.
14. The laboratory made a transcription error. No hits were found in the raw data.
15. This analyte is rejected because the laboratory exceeded the holding time for digestion and analysis.

16. The laboratory subtracted the preparation/reagent blank from the sample result. The Reviewer's calculation puts the preparation/reagent blank back into the result.
17. The photocopy is unreadable. Therefore, the QA reviewer cannot read the laboratory's reported concentration result.
18. The reported value was qualified because the predigestion spike recovery was less than 75 %, but greater than 50%.
19. The reported value was qualified because the predigestion spike recovery was greater than 125 percent.
20. The non-detected value was qualified (UJ) because the predigestion and or redigestion spike recovery was less than 75 percent. The possibility of a false negative exists.
21. The reported result was qualified or rejected because the laboratory did not record the pH value(s) of the sample in a laboratory notebook.
22. The reported value was qualified (J/UJ) because the sample moisture content exceeded 50 percent.
23. The sample result was rejected because the soluble and insoluble matrix spike recoveries were less than 50%.
24. The detected sample result was qualified (J) because the incorrect spike concentration was used.
25. The reported sample results were rejected because the predigestion spike recovery was greater than 150 percent.
26. The reported sample results were rejected because the redigestion spike recovery was greater than 150 percent.
27. The reported value was qualified (J) because the redigestion spike recovery was less than 75 percent.
28. The reported value was qualified (J/UJ) because the sample digestion temperature was less than 90C.
29. In the Field Duplicate Sample Analysis, Hexavalent Chromium fell outside the control limits of $\leq 50\%$ for sample results $> 5xRL$ or $+ RL$ for sample results $< 5xRL$. Therefore, the result was qualified.
30. The reported value was qualified as estimated (J/UJ) but the bias is uncertain due to both high and low MS recoveries.
31. The reported result was greater than the MDL but less than the RL and qualified (J) as estimated by the laboratory.

32. The reported value was qualified because the sample replicate precision criterion of < 20% for method 7199 was exceeded.
33. The reported value was qualified (J/UJ) because the laboratory control sample (LCS) recovery was less than 80%.
34. The reported value was qualified (J) because the laboratory control sample (LCS) recovery was greater than 120%.
35. The reported result was qualified because the matrix spike analysis was not performed at the proper frequency.
36. The reported result was qualified because the laboratory duplicate analysis was not performed at the proper frequency.
37. The result was qualified because the cooler temperature upon sample receipt exceeded 6C.
38. The reported value was qualified because the redigestion spike recovery was greater than 125 percent.
39. The reported result was rejected because the laboratory failed to perform the reanalysis due to insufficient sample volume.
40. The reported results was qualified because the laboratory failed to analyze an ending CCB.
41. The reported result was qualified because the laboratory failed to make the proper method specific pH adjustment.
42. The reported result was rejected because the laboratory failed to reanalyze the MS and associated sample(s) due to failed MS recoveries.
43. The hexavalent chromium was greater than the total chromium result and the percent difference between the results fell outside the control limits of < 20% for sample results > 4xRL or the absolute difference was greater than +/- RL for sample results < 4xRL; therefore, the hexavalent chromium result was qualified as estimated.
- 44 The reported result was qualified as estimated due to negative instrument drift.
45. The reported result was qualified because the continuing calibration verification (CCV) recovery was greater than 110%.
46. The reported value was qualified because the sample digestion temperature was not recorded on the laboratory bench sheet.

Aqueous Target Analyte Summary Hit List Hexavalent Chromium

Site Name PPG Garfield Avenue – Forrest Street Additional Remedial Investigation (GARIS)
Sampling Date June 2, 2015
Lab Name/ID Accutest, Dayton, NJ
SDG No JB96034
Sample Matrix Soil
Trip Blank ID NA
Field Blank ID FB-20150602

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/L)	Validation Sample Result (mg/L)	RL (mg/L)	Quality Assurance Decision	NJDEP Validation Footnote
EF-73A-GWU-40.0-44.0	JB96034-15	CHROMIUM (HEXAVALENT)	U	5.3	5.3	0.20		
EF-73A-GWF-40.0-44.0	JB96034-16F	CHROMIUM (HEXAVALENT)	U	5.7	5.7	0.50		
FS22-GWU-10.0-14.0	JB96034-23	CHROMIUM (HEXAVALENT)	U	0.013	0.013	0.010		
EF-73A-GWF-30.0-34.0	JB96034-7	CHROMIUM (HEXAVALENT)	U	40.6	40.6	1.0		
EF-73A-GWU-30.0-34.0	JB96034-8	CHROMIUM (HEXAVALENT)	U	22.6	22.6	0.50		

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

NJDEP Aqueous Hexavalent Chromium Laboratory Footnote

1. The value reported is less than or equal to 3x the value in the preparation/reagent blank. It is the policy of NJDEP-DPFSR to negate the reported value due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
2. The value reported is greater than three (3) times but less than ten (10) times the value in the preparation/reagent blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to the preparation/reagent blank contamination. The "B" qualifier alerts the end-user to the presence of this analyte in the preparation/reagent blank.
3. The value reported is less than or equal to three (3) times the value in the trip/field blank. It is the policy of NJDEP-DPFSR to negate the reported value as due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
4. The value reported is greater than three (3) times but less than ten (10) times the value in the trip/field blanks and is considered "real". However, the reported value must be quantitatively qualified "J" due to trip/field blank contamination.

5. The concentration reported by the laboratory is incorrectly calculated.
6. The laboratory failed to report the presence of the analyte in the sample.
7. The reported Hexavalent Chromium value was qualified because the Calibration Check Standard was not within the recovery range (90-110 percent).
8. In the Duplicate Sample Analysis, Hexavalent Chromium fell outside the control limits of ≤ 20 percent for sample results $> 4xRL$ or $+ RL$ for sample results $< 4xRL$. Therefore, the result was qualified.
9. This analyte was rejected because the laboratory performed the Duplicate Analysis on a field blank.
10. The reported value was qualified because the PVS recovery was greater than 115 percent.
11. The reported value was qualified because the PVS recovery was less than 85 percent.
12. The non-detected value was qualified (UJ) because the PVS recovery was less than 85 percent. The possibility of a false negative exists.
13. The reported analyte was qualified because the associated Calibration Blank result was greater than the MDL.
14. The laboratory made a transcription error. No hits were found in the raw data.
15. This analyte is rejected or qualified because the laboratory exceeded the holding time for digestion and analysis.
16. The laboratory subtracted the preparation/reagent blank from the sample result. The Reviewer's calculation puts the preparation/reagent blank back into the result.
17. The photocopy is unreadable. Therefore, the QA reviewer cannot read the laboratory's reported concentration result.
18. The reported value was qualified because the predigestion spike recovery was less than 75 %, but greater than 50%.
19. The reported value was qualified because the predigestion spike recovery was greater than 125 percent.
20. The non-detected value was qualified (UJ) because the predigestion and or redigestion spike recovery was less than 75 percent. The possibility of a false negative exists.

21. The reported result was qualified or rejected because the laboratory did not record the pH value(s) of the sample in a laboratory notebook.
22. The reported value was qualified because the sample digestion temperature was not recorded on the laboratory bench sheet.
23. The sample result was rejected because the soluble and insoluble matrix spike recoveries were less than 50%.
24. The detected sample result was qualified (J) because the incorrect spike concentration was used.
25. The reported sample results were rejected because the predigestion spike recovery was greater than 150 percent.
26. The reported sample results were rejected because the redigestion spike recovery was greater than 150 percent.
27. The reported value was qualified (J) because the redigestion spike recovery was less than 85 percent.
28. The reported value was qualified (J/UJ) because the sample digestion temperature was less than 90C.
29. The reported value(s) were qualified (J/UJ) because the field duplicate RPD was >30% for both sample results >5xRL.
30. The reported value was qualified as estimated (J/UJ) but the bias is uncertain due to both high and low MS recoveries.
31. The reported result was greater than the MDL but less than the RL and qualified (J) as estimated by the laboratory.
32. The reported value was qualified because the sample replicate precision criterion of < 20% for method 7199 was exceeded.
33. The reported value was qualified (J/UJ) because the laboratory control sample (LCS) recovery was less than 90%.
34. The reported value was qualified (J) because the laboratory control sample (LCS) recovery was greater than 110%.
35. The reported result was qualified because the matrix spike analysis was not performed at the proper frequency.
36. The reported result was qualified because the laboratory duplicate analysis was not performed at the proper frequency.
37. The result was qualified because the cooler temperature upon sample receipt exceeded 6C.

38. The reported value was qualified because the redigestion spike recovery was greater than 115 percent.
39. The reported result was rejected because the laboratory failed to perform the reanalysis due to insufficient sample volume.
40. The reported results was qualified because the laboratory failed to analyze an ending CCB.
41. The reported result was qualified because the laboratory failed to make the proper method specific pH adjustment.
42. The reported result was rejected because the laboratory failed to reanalyze the MS and associated sample(s) due to failed MS recoveries.
43. The dissolved hexavalent chromium result was > the total hexavalent chromium result and the relative percent difference between the total and dissolved hexavalent chromium results fell outside the control limits of < 20% for sample results > 4xRL or absolute difference of +/- RL for sample results < 4xRL. Therefore, the results in both the total and dissolved fractions were qualified.
44. The dissolved hexavalent chromium result was > the dissolved chromium result or the total hexavalent chromium result was > the total chromium result and the relative percent difference between the total and dissolved results fell outside the control limits of < 20% for sample results > 4xRL or absolute difference of +/- RL for sample results < 4xRL. Therefore, the results in both the total and dissolved fractions were qualified.
45. The reported result was qualified as estimated due to negative instrument drift.
46. The reported result was qualified because the continuing calibration verification (CCV) recovery was greater than 110%.

Soil Target Analyte Summary Hit List (Metals)

Site Name PPG Garfield Avenue – Forrest Street Additional Remedial Investigation (GARIS)
Sampling Date June 2, 2015
Lab Name/ID Accutest, Dayton, NJ
SDG No JB96034A
Sample Matrix Soil
Trip Blank ID NA
Field Blank ID FB-20150602

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
EF-73A-32.0-32.5	JB96034-10A	VANADIUM	U	11.0	11.0	5.9		
EF-73A-32.0-32.5	JB96034-10A	CHROMIUM	U	68.9	68.9	1.2		
EF-73A-32.0-32.5	JB96034-10A	NICKEL	-0.0096	6.0	6.0	4.7		
EF-73A-32.0-32.5	JB96034-10A	THALLIUM	-0.096	U	U	1.2	Qualify	24
EF-73A-34.0-34.5	JB96034-11A	VANADIUM	U	12.1	12.1	6.0		
EF-73A-34.0-34.5	JB96034-11A	CHROMIUM	U	22.6	22.6	1.2		
EF-73A-34.0-34.5	JB96034-11A	NICKEL	-0.0096	8.0	8.0	4.8		
EF-73A-34.0-34.5	JB96034-11A	THALLIUM	-0.096	U	U	1.2	Qualify	24
EF-73A-36.0-36.5	JB96034-12A	VANADIUM	U	10.2	10.2	6.0		
EF-73A-36.0-36.5	JB96034-12A	CHROMIUM	U	9.0	9.0	1.2		
EF-73A-36.0-36.5	JB96034-12A	NICKEL	-0.0096	3.9	3.9	4.8	Qualify	22
EF-73A-36.0-36.5	JB96034-12A	THALLIUM	-0.096	U	U	1.2	Qualify	24
EF-73A-38.0-38.5	JB96034-13A	VANADIUM	U	8.8	8.8	6.1		
EF-73A-38.0-38.5	JB96034-13A	CHROMIUM	U	5.2	5.2	1.2		
EF-73A-38.0-38.5	JB96034-13A	NICKEL	-0.0096	3.2	3.2	4.9	Qualify	22
EF-73A-38.0-38.5	JB96034-13A	THALLIUM	-0.096	U	U	1.2	Qualify	24
EF-73A-39.5-40.0	JB96034-14A	VANADIUM	U	10.7	10.7	5.8		
EF-73A-39.5-40.0	JB96034-14A	CHROMIUM	U	6.6	6.6	1.2		
EF-73A-39.5-40.0	JB96034-14A	NICKEL	-0.0096	4.6	4.6	4.6		
EF-73A-39.5-40.0	JB96034-14A	THALLIUM	-0.096	U	U	1.2	Qualify	24
FS22-0.0-0.5	JB96034-17A	VANADIUM	U	15.6	15.6	5.6		
FS22-0.0-0.5	JB96034-17A	CHROMIUM	U	12.4	12.4	1.1		
FS22-0.0-0.5	JB96034-17A	ANTIMONY	U	0.38	0.38	2.2	Qualify	22

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
FS22-0.0-0.5	JB96034-17A	NICKEL	-0.0096	9.6	9.6	4.4		
FS22-0.0-0.5	JB96034-17A	THALLIUM	-0.096	U	U	1.1	Qualify	24
FS22-0.0-0.5X	JB96034-18A	VANADIUM	U	15.7	15.7	5.5		
FS22-0.0-0.5X	JB96034-18A	CHROMIUM	U	13.1	13.1	1.1		
FS22-0.0-0.5X	JB96034-18A	NICKEL	-0.0096	7.0	7.0	4.4		
FS22-0.0-0.5X	JB96034-18A	THALLIUM	-0.096	U	U	1.1	Qualify	24
FS22-2.0-2.5	JB96034-19A	VANADIUM	U	19.4	19.4	5.0		
FS22-2.0-2.5	JB96034-19A	CHROMIUM	U	14.2	14.2	1.0		
FS22-2.0-2.5	JB96034-19A	ANTIMONY	U	0.35	0.35	2.0	Qualify	22
FS22-2.0-2.5	JB96034-19A	NICKEL	-0.0096	12.6	12.6	4.0		
FS22-2.0-2.5	JB96034-19A	THALLIUM	-0.096	U	U	1.0	Qualify	24
FS22-6.0-6.5	JB96034-20A	VANADIUM	U	17.8	17.8	5.0		
FS22-6.0-6.5	JB96034-20A	CHROMIUM	U	14.1	14.1	1.0		
FS22-6.0-6.5	JB96034-20A	ANTIMONY	U	0.37	0.37	2.0	Qualify	22
FS22-6.0-6.5	JB96034-20A	THALLIUM	-0.096	0.26	0.26	1.0	Qualify	22,24
FS22-6.0-6.5	JB96034-20A	NICKEL	-0.0096	13.5	13.5	4.0		
FS22-8.0-8.5	JB96034-21A	NICKEL	-0.0096	15.2	15.2	4.1		
FS22-8.0-8.5	JB96034-21A	CHROMIUM	U	18.7	18.7	1.0		
FS22-8.0-8.5	JB96034-21A	VANADIUM	U	26.8	26.8	5.1		
FS22-8.0-8.5	JB96034-21A	THALLIUM	-0.096	U	U	1.0	Qualify	24
EF-73A-20.0-20.5	JB96034-2A	VANADIUM	U	10.6	10.6	6.3		
EF-73A-20.0-20.5	JB96034-2A	CHROMIUM	U	22.6	22.6	1.3		
EF-73A-20.0-20.5	JB96034-2A	NICKEL	-0.0096	5.5	5.5	5.0		
EF-73A-20.0-20.5	JB96034-2A	THALLIUM	-0.096	U	U	1.3	Qualify	24
EF-73A-22.0-22.5	JB96034-3A	VANADIUM	U	9.8	9.8	5.1		
EF-73A-22.0-22.5	JB96034-3A	CHROMIUM	U	36.4	36.4	1.0		
EF-73A-22.0-22.5	JB96034-3A	NICKEL	-0.0096	6.6	6.6	4.1		
EF-73A-22.0-22.5	JB96034-3A	THALLIUM	-0.096	U	U	1.0	Qualify	24
EF-73A-24.0-24.5	JB96034-4A	VANADIUM	U	25.8	25.8	5.7		
EF-73A-24.0-24.5	JB96034-4A	CHROMIUM	U	56.7	56.7	1.1		
EF-73A-24.0-24.5	JB96034-4A	NICKEL	-0.0096	9.3	9.3	4.6		
EF-73A-24.0-24.5	JB96034-4A	THALLIUM	-0.096	U	U	1.1	Qualify	24

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
EF-73A-26.0-26.5	JB96034-5A	VANADIUM	U	19.5	19.5	5.8		
EF-73A-26.0-26.5	JB96034-5A	CHROMIUM	U	67.6	67.6	1.2		
EF-73A-26.0-26.5	JB96034-5A	NICKEL	-0.0096	12.1	12.1	4.6		
EF-73A-26.0-26.5	JB96034-5A	THALLIUM	-0.096	U	U	1.2	Qualify	24
EF-73S-28.0-28.5	JB96034-6A	VANADIUM	U	17.0	17.0	5.5		
EF-73S-28.0-28.5	JB96034-6A	CHROMIUM	U	119	119	1.1		
EF-73S-28.0-28.5	JB96034-6A	NICKEL	-0.0096	7.8	7.8	4.4		
EF-73S-28.0-28.5	JB96034-6A	THALLIUM	-0.096	U	U	1.1	Qualify	24
EF-73A-30.0-30.5	JB96034-9A	VANADIUM	U	10.4	10.4	5.0		
EF-73A-30.0-30.5	JB96034-9A	CHROMIUM	U	118	118	1.0		
EF-73A-30.0-30.5	JB96034-9A	NICKEL	-0.0096	4.9	4.9	4.0		
EF-73A-30.0-30.5	JB96034-9A	THALLIUM	-0.096	U	U	1.0	Qualify	24

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

NJDEP Soil Metals Laboratory Footnotes

1. The value reported is less than or equal to 3x the value in the method blank. It is the policy of NJDEP-DPFSR to negate the reported value due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
2. The value reported is greater than three (3) but less than ten (10) times the value in the method blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to the method blank contamination. The "B" qualifier alerts the end-user to the presence of this analyte in the method blank.
3. The value reported is less than or equal to 3x the value in the trip/field blank. It is the policy of NJDEP-DPFSR to negate the reported value as due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
4. The value reported is greater than 3x but less than ten (10) the value in the trip/field blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to trip/field blank contamination.
5. The concentration reported by the laboratory is incorrectly calculated.

6. The laboratory failed to report the presence of the analyte in the sample.
7. The reported metal value was qualified because the Calibration Verification Standard was not within the recovery range (90-110 percent).
8. In the MS/MSD Sample Analysis, this analyte fell outside the control limits of 20% RPD. Therefore, the result was qualified.
9. This analyte was qualified because the laboratory performed the MS/MSD Analysis on a field blank.
10. The reported analyte was qualified because the associated Calibration Blank result was greater than the MDL.
11. The reported value was qualified because serial dilution analysis was not within QC limit of 10% D.
12. This analyte is qualified or rejected because the laboratory exceeded the holding time for digestion and analysis.
13. The laboratory subtracted the method blank from the sample result. The reviewer's calculation has added the method blank result to the reported concentration.
14. The photocopy submitted is illegible. Therefore, the QA reviewer cannot read the laboratory's reported concentration result.
15. The reported or nondetected value was qualified because the MS/MSD spike recovery was less than 75 percent.
16. The reported value was qualified because the MS/MSD spike recovery was greater than 125 percent.
17. The reported value was qualified as estimated (J/UJ) but the bias is uncertain due to both high and low MS recoveries.
18. The reported values were qualified because the laboratory duplicate exceeded 35 percent RPD or the absolute difference exceeded the reporting limit for sample results < 5X the reporting limit.
19. The reported value was qualified because the field duplicate exceeded 50 percent RPD for results > 5X the reporting limit.
20. The reported value was qualified because the LCS recovery was less than 80 percent.
21. The reported value was qualified because the sample moisture content was greater than 50 percent.
22. The reported result was greater than the MDL but less than the RL and qualified (J) as estimated by the laboratory.

23. The reported value was qualified because the LCS recovery was greater than 120 percent.
24. The reported value was qualified because of negative instrument drift.
25. The reported value was qualified as estimated (J/UJ) but the bias is uncertain due to either an acceptable MS recovery and high or low MSD recovery, or acceptable MSD recovery and a high or low MS recovery.
26. The reported calculated value was negated since one or both of the values in the calculation were negated.

Aqueous Target Analyte Summary Hit List (Metals)

Site Name PPG Garfield Avenue – Forrest Street Additional Remedial Investigation (GARIS)
Sampling Date June 2, 2015
Lab Name/ID Accutest, Dayton, NJ
SDG No JB96034A
Sample Matrix Soil
Trip Blank ID NA
Field Blank ID FB-20150602

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/L)	Validation Sample Result (mg/L)	RL (mg/L)	Quality Assurance Decision	NJDEP Validation Footnote
EF-73A-GWU-40.0-44.0	JB96034-15A	CHROMIUM	U	4590	4590	10		
EF-73A-GWF-40.0-44.0	JB96034-16FA	CHROMIUM	U	19.8	19.8	10		
FS22-GWF-10.0-14.0	JB96034-22A	CHROMIUM	U	14.7	14.7	10		
FS22-GWU-10.0-14.0	JB96034-23A	CHROMIUM	U	4930	4930	100		
EF-73A-GWF-30.0-34.0	JB96034-7A	CHROMIUM	U	8730	8730	10		
EF-73A-GWU-30.0-34.0	JB96034-8A	CHROMIUM	U	3700	3700	10		

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

Aqueous Metals NJDEP Laboratory Footnotes

1. The value reported is less than or equal to 3x the value in the method blank. It is the policy of NJDEP-DPFSR to negate the reported value due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
2. The value reported is greater than three (3) but less than ten (10) times the value in the method blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to the method blank contamination. The "B" qualifier alerts the end-user to the presence of this analyte in the method blank.
3. The value reported is less than or equal to 3x the value in the trip/field blank. It is the policy of NJDEP-DPFSR to negate the reported value as due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.

4. The value reported is greater than 3x but less than ten (10) the value in the trip/field blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to trip/field blank contamination.
5. The concentration reported by the laboratory is incorrectly calculated.
6. The laboratory failed to report the presence of the analyte in the sample.
7. The reported metal value was qualified because the Calibration Verification Standard was not within the recovery range (90-110 percent).
8. In the MS/MSD Sample Analysis, this analyte fell outside the control limits of 20% RPD. Therefore, the result was qualified.
9. This analyte was qualified because the laboratory performed the MS/MSD Analysis on a field blank.
10. The reported analyte was qualified because the associated Calibration Blank result was greater than the MDL.
11. The reported value was qualified because serial dilution analysis was not within QC limit of 10% D.
12. This analyte is rejected or qualified because the laboratory exceeded the holding time for digestion and analysis.
13. The laboratory subtracted the method blank from the sample result. The reviewer's calculation has added the method blank result to the reported concentration.
14. The photocopy submitted is illegible. Therefore, the QA reviewer cannot read the laboratory's reported concentration result.
15. The reported or nondetected value was qualified because the MS/MSD spike recovery was less than 75 percent for metals or less than 90% for wet chem.
16. The reported value was qualified because the MS/MSD spike recovery was greater than 125 percent for metals or greater than 110% for wet chem.
17. The reported value was qualified as estimated (J/UJ) but the bias is uncertain due to both high and low MS recoveries.
18. The reported values were qualified because the laboratory duplicate exceeded 20 percent RPD or the absolute difference exceeded the reporting limit for sample results < 5X the reporting limit.
19. The reported value was qualified because the field duplicate exceeded 30 percent RPD for results > 5X the reporting limit.

20. The reported value was qualified because the LCS recovery was less than 80 percent.
21. The reported result was greater than the MDL but less than the RL and qualified (J) as estimated by the laboratory.
22. The reported value was qualified because the LCS recovery was greater than 120 percent.
23. The reported value was qualified because of negative instrument drift.

Attachment B

Data Validation Report Form

Client Name: PPG Industries	Project Number: 60314351.GA.DE.PDI.P3
Site Location: PPG Garfield Avenue – Forrest Street Additional Remedial Investigation (GARIS)	Project Manager: Bill Spronz
Laboratory: Accutest, Dayton, NJ	Type of Validation: Full
Laboratory Job No: JB96034	Date Checked: 7/9/2015
Validator: Justin Webster	Peer: Lisa Krowitz

ITEM	YES	NO	N/A	COMMENTS
Sample results included?	X			
Reporting Limits met project requirements?	X			
Field I.D. included?	X			
Laboratory I.D. included?	X			
Sample matrix included?	X			
Sample receipt temperature 2-6°C?	X			
Signed COCs included?	X			
Date of sample collection included?	X			
Date of sample digestion included?	X			
Holding time to digestion met criteria? (Soils -30 days from collection to digestion.)	X			
Date of analysis included?	X			
Holding time to analysis met criteria? (Soils -168 hours from digestion to analysis; Aqueous - 24 hours from collection to analysis.)	X			
Method reference included?	X			
Laboratory Case Narrative included?	X			

Definitions: MDL Method Detection Limit; %R Percent Recovery; RL Reporting Limit; RPD Relative Percent Difference; RSD Relative Standard Deviation :Corr Correlation Coefficient.

ITEM	YES	NO	N/A	COMMENTS
Initial calibration documentation included in lab package?	X			
1) Blank plus 4 standards (7196A) or blank plus 3 standards (7199)	X			
2) Correlation coefficient of =0.995 (7196A) or =0.999 (7199)	X			
3) Calibrate daily or each time instrument is set up.	X			
Calibration Check Standard (CCS) for 7196A and Quality Control Sample (QCS) for 7199 Included in Lab Package?	X			
1) %R criteria met? (90 - 110%)	X			
2) Correct frequency of one per every 10 samples	X			
3) CCS and QCS from independent source and at mid-level of calibration curve	X			
Calibration Blanks	X			
1) Analyzed prior to initial calibration standards and after each CCS/QCS?	X			
2) Absolute value should not exceed MDL.	X			
Method Blank, Field Blanks and/or Equipment Blanks Included in Lab Package?	X			
1) Method blank analyzed with each preparation batch?	X			
2) Absolute value should not exceed MDL.	X			
Eh and pH Data	X			
1) Eh and pH data was included and plotted for all samples?	X			
Soluble Matrix Spike Data Included in Lab Package?	X			
1) Soluble Matrix %R criteria met? (75-125%R).	X			
2) Was the spike concentration 40 mg/Kg or twice the sample concentration?	X			
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	X			
Insoluble Matrix Spike Data Included in Lab Package?	X			
1) Insoluble Matrix %R criteria met? (75-125%R).	X			
2) Was the spike concentration around 400 to 800 mg/Kg?		X		Insoluble MS concentration was 1017.88 mg/kg. No actions taken since MS recoveries were acceptable.
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	X			

ITEM	YES	NO	N/A	COMMENTS
Post Digestion Spike	X			
1) Post Digestion Spike %R criteria met? (85-115%R).	X			
2) Was the spike concentration 40 mg/Kg or twice the sample concentration?	X			
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	X			
Sample Duplicate Data Included in Lab Package?	X			
1) RPD criteria met? (RPD ≤ 20%) if both results are ≤4x RL or absolute difference ≤ RL if either or both results are <4xRL	X			
2) Was a sample duplicate analyzed at the frequency of 1 per batch or 20 samples?	X			
Was a Laboratory Control Sample (LCS) Included in Lab Package?	X			
1) %R criteria met? (80-120%R).	X			
2) Was an LCS analyzed at the frequency of 1/batch or 20 samples?	X			
Were any Field Duplicate samples submitted with this SDG?	X			JB96034-17/18
1) Were Field duplicate RPD criteria met? (RPD≤50% for both sample results >5xRL or professional judgement if either or both results are <5xRL.	X			
Were all sample quantitation and reporting requirements met?	X			
1) Were all solid samples reported with percent solids > 50%?	X			
2) Were any samples analyzed or reported with dilutions?	X			
Miscellaneous Items	X			
1) For soils by 7196A, was the pH within a range of 7.0-8.0?	X			
2) For soils by 7199, was the pH within a range of 9.0-9.5?			X	
3) For aqueous by 7196A, was the pH with a range of 1.5-2.5?	X			
4) For soils (3060A), was the digestion temperature 90-95C for at least 60 minutes?	X			
5) For 7199, was each sample injected twice and was the RPD =20?			X	

SDG#: JB96034/ Method 7196A

Batch: GN27136

Cr+6 ICAL 6/14/2015

Soil

(p. 105 of data pkg)

x - concentration	y - response
0	0
0.01	0.009
0.05	0.045
0.1	0.088
0.3	0.254
0.5	0.426
0.8	0.667
1	0.834

(p. 105 of data pkg)

AECOM Calculated Offset	0.0030	OK	Reported Offset	0.0030
AECOM Slope	0.8329	OK	Reported Slope	0.8329
AECOM Calculated r	0.99995	OK	Reported r	0.99995

LCS calculation

GP89794-B1

P.65,105

Background Absorbance	0
Total absorbance	0.802
Total absorbance - background	0.802
Instrument Concentration	0.959
Sample weight (mg/kg)	0.0025
Final Volume (L)	0.1
Dilution Factor	1

AECOM Calculated LCS Result (mg/Kg)	38.4	OK	Reported Result (mg/Kg)	38.4
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%R = Found/True*100

GP89794-B1

P.65,105

True Value (mg/kg)	40
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AECOM Calculated %R	95.9	OK rounding	Reported %R	96
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MS calculation

GP89794-S1

P.67,105

Background reading	0
Total absorbance	0.465
Total absorbance - background	0.465
Instrument Concentration	0.555
Sample weight (mg/kg)	0.00246
Final Volume (L)	0.1
Percent solids	0.809
Dilution Factor	2

AECOM Calculated MS Result (mg/Kg)	55.7	OK	Reported Result (mg/Kg)	55.7
------------------------------------	------	----	-------------------------	------

%R = Found/True*100

GP89794-S1

P.67,105

True Value (mg/kg)	50.3
--------------------	------

Native concentration (mg/Kg)	7.7
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AECOM%R	95.5	OK rounding	Reported %R	95.4
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Percent Solids

P.68

EF-73A-20.0-20.5

Empty dish weight=	29
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Wet weight=	35.33
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Dry weight=	34.12
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AECOM%solids =	80.9	OK	Reported %solids=	80.9
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Reporting Limit		P.14	EF-73A-20.0-20.5
Low Standard	0.01		
Initial weight (mg/kg)	0.00248		
Final volume (L)	0.1		
Percent solids	0.809		
Dilution Factor	1		
Reporting Limit	0.50	OK rounding	Reported RL (mg/Kg)= 0.49

Sample Calculations		P.14, 106	EF-73A-20.0-20.5
Background reading	0		
Total absorbance	0.131		
Total absorbance - background	0.131		
Instrument Response	0.154		
Sample weight (mg/kg)	0.00248		
Final Volume (L)	0.1		
Percent solids	0.809		
Dilution Factor	1		
AECOM Calculated Result (mg/Kg)	7.7	OK	Reported Result (mg/Kg) 7.7

SDG#: JB96034/ Method 7196A

Batch: GN26484

Cr+6 ICAL 6/1/2015

Aqueous

(p. 72 of data pkg)

x - concentration	y - response
0	0
0.01	0.009
0.05	0.044
0.1	0.088
0.3	0.252
0.5	0.439
0.8	0.659
1	0.839

(p. 72 of data pkg)

AECOM Calculated Offset	0.0032	OK	Reported Offset	0.0032
AECOM Slope	0.8348	OK	Reported Slope	0.8348
AECOM Calculated r	0.99965	OK	Reported r	0.99965

LCS calculation

GP26484-B1

P.65,72

Background Absorbance

0

Total absorbance

0.134

Total absorbance - background

0.134

Instrument Concentration

0.1566

Dilution Factor

1

AECOM Calculated LCS Result (mg/L)	0.16	OK	Reported Result (mg/L)	0.16
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%R = Found/True*100

GP26484-B1

P.65,72

True Value (mg/L)

0.15

AECOM Calculated %R	104.4	OK rounding	Reported %R	107
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MS calculation

GN26400-S5

P.67,72

Background reading

0

Total absorbance

0.131

Total absorbance - background

0.131

Instrument Concentration

0.1530

Dilution Factor

1

AECOM Calculated MS Result (mg/L)	0.15	OK	Reported Result (mg/L)	0.15
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%R = Found/True*100

GN26400-S5

P.67,72

True Value (mg/L)

0.15

Native concentration (mg/L)

0

AECOM %R	102.0	OK rounding	Reported %R	100.0
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Reporting Limit

P.34

EF-73A-GWF-20.0-24.0

Low Standard

0.01

Dilution Factor

1

Reporting Limit	0.01	OK	Reported RL (mg/L)=	0.01
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Sample Calculations

P.19, 72

EF-73A-GWF-30.0-34.0

Background reading

0

Total absorbance

0.342

Total absorbance - background

0.342

Instrument Response

0.406

Dilution Factor

100

AECOM Calculated Result (mg/L)	40.6	OK	Reported Result (mg/L)	40.6
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Client Name: PPG Industries				Project Number: 60279173.GA.RI.RPT.FOR	
Site Location: PPG Garfield Avenue – Forrest Street Additional Remedial Investigation (GARIS)				Project Manager: Bill Spronz	
Laboratory: Accutest, Dayton, NJ				Type of Validation: Limited	
Laboratory Job No: JB96034A				Date Checked: 7/9/2015	
Validator: Justin Webster				Peer: Lisa Krowitz	
ITEM	YES	NO	N/A	COMMENTS	
Sample results included?	X				
Reporting Limits met project requirements?	X				
Field I.D. included?	X				
Laboratory I.D. included?	X				
Sample matrix included?	X				
Sample receipt temperature 2-6C?	X				
Signed COCs included?	X				
Date of sample collection included?	X				
Date of sample digestion included?	X				
Date of analysis included?	X				
Holding time met QC criteria? (Aqueous – 28 days HCl to pH < 2, Cool, ≤ 6 °C)	X				
Method reference included?	X				
Laboratory Case Narrative included?	X				
Definitions: MDL - Method Detection Limit; %R - Percent Recovery; RL - Reporting Limit; RPD - Relative Percent Difference; RSD - Relative Standard Deviation :Corr - Correlation Coefficient.					

ITEM	YES	NO	N/A	COMMENTS
Sample dilutions?		X		
Initial calibration documentation included in lab package?			X	N/A for Limited Validation
1) Calibrate daily or each time instrument is set up.			X	
2) ICP (6010) -Blank plus 1 standard? If no, reject (R) data.			X	
3) Hg (7470/7471) -Blank plus 5 standards? If no, reject (R) data.			X	
Initial Calibration Verification Standard (ICV) for ICP (6010) and Initial Calibration Check Standard (ICCS) for Hg (7470/7471) included in lab package?			X	N/A for Limited Validation
1) Analyzed immediately after initial calibration? If no, reject (R) data.			X	
2) %R criteria met? (90-110%). If no, J positive results for affected analyte(s) if %R between 80-89% and 111-120% and indicate bias; UJ non-detect results for affected analyte(s) if %R between 80-89%, and R all data for affected analyte(s) if %R <80% or >120%.			X	
3) Spot check ICV/ICCS results for several analytes.			X	
Continuing Calibration Verification Standard (CCV) for ICP (6010) and Calibration Check Standard (CCS) for Hg (7470/7471) included in Lab Package?			X	N/A for Limited Validation
1) Analyzed immediately after each ICV/ICC/CB and after every 10 samples? If no, reject (R) data.			X	
2) CCS and CCV from independent source and at mid-level of calibration curve. If no, reject (R) data.			X	
3) %R criteria met? (90-110%R). If no, J positive results for affected analyte(s) if %R between 80-89% and 111-120% and indicate bias; UJ non-detect results for affected analyte(s) if %R between 80-89% and R all data for affected analyte(s) if %R <80% or >120%.			X	
4) Spot check CCV/CCS results for several analytes.			X	
Low Calibration Standard (CRI) included in Lab Package?			X	N/A for Limited Validation
1) %R criteria met? - 50-150% for Co, Mn, Zn, by ICP-MS; Pb, Tl by 6010; 70-130% all others. If no, refer to ILM05.4 NJ SOP 5.A.2 for actions.			X	

ITEM	YES	NO	N/A	COMMENTS
Calibration Blanks			X	N/A for Limited Validation
1) Analyzed after daily calibration and after each ICV/ICC/CCV/CCS and after every 10 samples? If no, reject (R) data.			X	
2) Absolute value <3xIDL? If no, -if sample result <10x CB result, qualify affected analyte(s) in associated samples with CB; -if sample result >10xCB result, no qualification.			X	
Method Blank Included in Lab Package?	X			
1) Method blank analyzed with each preparation batch or every SDG, or 1/20 samples? If no, reject (R) data, except no aqueous MB required for FB/EB if only soil samples were analyzed.	X			
2) Method blank analyzed 1/20 samples? If - MB 1/25, J sample results from 21-25; -MB >1/25, R sample results after 25th sample.	X			
3) MB results nondetect? If no, -sample result <3xMB, negate UB; -sample result>3xMB but <10xMB, JB; -sample result >10xMB, no qualification.	X			
4) Negative MB result reported? If yes, -Positive sample result<10xMB, qualify estimated, biased low (J); -Non-detect sample result, qualify UJ, may be false non-detect.	X			See nonconformance table
Field Blanks/Equipment Blanks Included in Lab Package?	X			
1) FB/EB result non-detect? If no, -sample result <3xFB/EB, negate U; -sample result>3xFB/EB but <10xMB, J; -sample result >10xFB/EB, no qualification.	X			
Interference Check Standards (ICSA and ICSB) included in Lab Package?	X			
1) Analyzed at beginning of analytical run? If no, reject (R) data.	X			
2) %R criteria met? (80-120%) If no, %R>120%, no qualification if sample result non-detect; %R between 121-150%, J positive results, biased high; %R between 50-79%, J/UJ results, biased low; %R<50% or >150%, reject (R) result	X			
3) Spot check accuracy of %Rs	X			

ITEM	YES	NO	N/A	COMMENTS
Matrix Spike/Matrix Spike Duplicate Data Included in Lab Package?	X			
1) MS/MSD %R (75-125%R) and RPD (+20% aq or 35% soils for SR \geq 5xRL or absolute difference <RL for SR<5xRL) criteria met? - %R>125% J positive results for affected analyte(s) for all samples in the same batch, accept NDs; -%R<75% J/UJ for affected analyte(s) for all samples in the same batch; - RPD outside limits J positive results for affected analyte(s) for all samples in the same batch/SDG, accept NDs. If absolute difference >RL for SR<5xRL estimate positive results and nondetects for affected analyte(s) for all samples in the same batch. For Hg same as above except Abs Diff between MS and MSD must be \leq 2xRL.		X		See nonconformance table
2) Was a sample spiked at the frequency of 1/batch or 20 samples?	X			
3) Was the MS performed on a site sample?	X			FS22-GWF-10.0-14.0, FS22-GWU-10.0-14.0, and EF-73A-20.0-20.5
4) Was the MS performed on a FB/EB or TB? If yes, J all sample data.		X		
Post Digestion Spike		X		
1) %R criteria met? (80-120%R) - %R>120% J positive results for affected analyte(s) for all samples in the same batch/SDG, accept NDs. - %R<80% J/UJ affected analyte(s) for all samples in the same batch.			X	
2) Was the spike performed on a FB/EB or TB? If yes, J all sample data.			X	
3) Was a sample spiked at the frequency of 1/batch or 20 samples?			X	
Laboratory Duplicate Data Included in Lab Package?	X			MS/MSD
Aqueous - If RPD is >35% for SR \leq 5xRL estimate (J) results.- If absolute difference is >RL for SR <RL estimate (J) positive and nondetects (UJ).- For Hg – Aq \leq 20%,	X			
Soil -- If RPD is >50% for SR \leq 5xRL estimate (J) results.- If absolute difference is >RL for SR <RL estimate (J) positive and nondetects (UJ).- For Hg Soil/Sediment \leq 35%,	X			

ITEM	YES	NO	N/A	COMMENTS
Was a Laboratory Control Sample (LCS) Included in Lab Package?	X			
1) LCS %R criteria met? (80-120%R or within vendor limits). If no, J/UJ all affected analytes(s) for all samples in the same batch/SDG.	X			
2) Was an LCS analyzed at the frequency of 1/batch or 20 samples? If no, J/UJ affected analyte(s) for all samples in the same batch/SDG.	X			
Serial Dilution	X			
1) %D (<10%R) criteria met? - If analyte concentration >10xRL and %D >10% J positive results for affected analyte(s) for all samples in the same batch, accept NDs.		X		See Nonconformance Table
2) Was the frequency 1/batch or 20 samples?	X			
3) Was a site sample used?	X			
4) Was a FB/EB or TB used? If yes, J all sample data.		X		
5) Spot check accuracy of %Ds.	X			
Field Duplicate Data included in Lab Package?	X			
Aqueous - If RPD is >30% for SR≤5xRL estimate (J) results.- If absolute difference is >RL for SR <RL estimate (J) positive and nondetects (UJ).-			X	
Soil -- If RPD is >50% for SR≤5xRL estimate (J) results.- If absolute difference is >RL for SR <RL estimate (J) positive and nondetects (UJ).-	X			See nonconformance table
Percent Solids data included in Lab Package?	X			
1) %Solids criteria (Reg 2 criteria) met? (≥50%)	X			

Nonconformance Tables**Blanks****Batch MP87043**

Analyte	Result	3x	10x	Actions	Associated Samples
Soil Method Blank	mg/kg	mg/kg	mg/kg		
Nickel	-0.0096	-0.0288	-0.096	None, absolute value < RL	All soil samples
Thallium	-0.096	-0.288	-0.96	None, absolute value < RL	

Serial Dilution**Batch MP87043**

Analyte	Original	5x dilution	% DIF	Actions	Associated Samples
	mg/kg	mg/kg	mg/kg		
Antimony	2.3	0	100	None, sample conc < 50 IDL	All soils collected in this SDG
Nickel	43.3	37.2	14.1	None, sample conc < 50 IDL	

Field Duplicate

Analyte	FS22-0.0-0.5 mg/kg	RL mg/kg	FS22-0.0-0.5X mg/kg	RL mg/kg	RPD (%)	Actions	Associated Samples
Antimony	0.38	2.2	0.34 U	2.5	NC	None	All soils collected in this SDG
Chromium	12.4	1.1	13.1	1.3	5.5%	None	
Nickel	9.6	4.4	7	5	31.3%	None	
Thallium	0.21 U	1.1	0.21 U.	1.3	NC	None	
Vanadium	15.6	5.6	15.7	6.3	0.6%	None	

Note:

NC - Not Calculated

Data Validation Report

Project:	PPG Garfield Avenue – Forrest Street Additional Remedial Investigation (GARIS)	
Laboratory:	Accutest, Dayton, NJ	
Laboratory Job No.:	JB96138, JB96138A	
Analysis/Method:	Hexavalent Chromium SW846 3060A/7196 Select Metals SW846 3050B/6010C	
Validation Level:	Full (Hexavalent Chromium) Limited (Antimony, Chromium, Nickel, Thallium, Vanadium)	
Site Location/Address:	90 & 98 Forrest Street Jersey City, NJ	
AECOM Project No:	60279173.GA.RI.RPT.FOR	
Prepared by:	Charlene Flint /AECOM	Completed on: 7/14/2015
Reviewed by:	Lisa Krowitz/AECOM	File Name: JB96138_A_2015_7_15_DV Report-F

Introduction

The data were reviewed in accordance with the FSP-QAPP and the following NJDEP guidance documents and validation Standard Operating Procedures (SOP):

- NJDEP Office of Data Quality SOP 5.A.10, Rev 3 (September 2009), SOP for Analytical Data Validation of Hexavalent Chromium - for USEPA SW-846 Method 3060A, and USEPA SW-846 Method 7196A;
- NJDEP Office of Data Quality SOP 5.A.16, Rev 1 (May 2002), Quality Assurance Data Validation of Analytical Deliverables for Inorganics (based on USEPA SW-846 Methods)
- Data Quality Assessment and Data Usability Evaluation Technical Guidance, version 1.0, April 2014;
- Data of Known Quality Protocols Technical Guidance, version 1.0, April 2014;

The results of quality control data analyzed with site samples were used to assess the overall reliability of the data. The following qualifiers were used to identify data quality issues

- U: Indicates the analyte was not detected in the sample above the sample reporting limit.
- J: Indicates the result was an estimated value; the associated numerical value was an approximate concentration of the analyte in the sample.

- UJ: Indicates the analyte was not detected above the reporting limit and the reporting limit was approximate.
- UB: The analyte concentration is less than or equal to three (3) times the concentration in the associated method/prep blank. The presence of the analyte in the sample is negated (UB) due to laboratory contamination.
- JB: The analyte concentration is greater than three (3) times, but less than or equal to ten (10) times the concentration in the associated method/prep blank. The presence of that analyte in the sample is considered "real". The concentration is quantitatively qualified (JB) due to method blank contamination.
- R: The sample result was rejected due to serious deficiencies; the presence or absence of the analyte could not be confirmed.
- RA: The sample result was rejected but is still considered usable.

Sample Information

The samples listed below were collected by AECOM on June 3, 2015 as part of the PPG Garfield Avenue – Forrest Street Additional Remedial Investigation (GARIS) sampling at 90 & 98 Forrest Street Jersey City, NJ. Only the samples and parameters listed below were validated.

Field ID	Laboratory ID	Matrix	Fraction
FB-20150603 (Field Blank)	JB96138-1	Aqueous	Hexavalent Chromium
FB-20150603 (Field Blank)	JB96138-1A	Aqueous	Metals
FS22-10.0-10.5	JB96138-2	Soil	Hexavalent Chromium
FS22-10.0-10.5	JB96138-2A	Soil	Metals
FS22-12.0-12.5	JB96138-3	Soil	Hexavalent Chromium
FS22-12.0-12.5	JB96138-3A	Soil	Metals
FS22-12.0-12.5X (Field Duplicate of FS22-12.0-12.5)	JB96138-4	Soil	Hexavalent Chromium
FS22-12.0-12.5X (Field Duplicate of FS22-12.0-12.5)	JB96138-4A	Soil	Metals
FS22-14.0-14.5	JB96138-5	Soil	Hexavalent Chromium
FS22-14.0-14.5	JB96138-5A	Soil	Metals
FS22-16.0-16.5	JB96138-6	Soil	Hexavalent Chromium
FS22-16.0-16.5	JB96138-6A	Soil	Metals
FS22-18.0-18.5	JB96138-7	Soil	Hexavalent Chromium
FS22-18.0-18.5	JB96138-7A	Soil	Metals
FS22-20.0-20.5	JB96138-10	Soil	Hexavalent Chromium
FS22-20.0-20.5	JB96138-10A	Soil	Metals
FS22-22.0-22.5	JB96138-11	Soil	Hexavalent Chromium
FS22-22.0-22.5	JB96138-11A	Soil	Metals
FS22-24.0-24.5	JB96138-12	Soil	Hexavalent Chromium
FS22-24.0-24.5	JB96138-12A	Soil	Metals
FS22-26.0-26.5	JB96138-13	Soil	Hexavalent Chromium

Field ID	Laboratory ID	Matrix	Fraction
FS22-26.0-26.5	JB96138-13A	Soil	Metals
FS22-28.0-28.5	JB96138-14	Soil	Hexavalent Chromium
FS22-28.0-28.5	JB96138-14A	Soil	Metals
FS22-3.0-3.5	JB96138-8	Soil	Hexavalent Chromium
FS22-3.0-3.5	JB96138-8A	Soil	Metals
FS22-30.0-30.5	JB96138-15	Soil	Hexavalent Chromium
FS22-30.0-30.5	JB96138-15A	Soil	Metals
FS22-32.0-32.5	JB96138-16	Soil	Hexavalent Chromium
FS22-32.0-32.5	JB96138-16A	Soil	Metals
FS22-34.0-34.5	JB96138-17	Soil	Hexavalent Chromium
FS22-34.0-34.5	JB96138-17A	Soil	Metals
FS22-35.0-35.5	JB96138-18	Soil	Hexavalent Chromium
FS22-35.0-35.5	JB96138-18A	Soil	Metals
FS22-5.0-5.5	JB96138-9	Soil	Hexavalent Chromium
FS22-5.0-5.5	JB96138-9A	Soil	Metals
FS22-GWF-40.0-44.0 (Filtered)	JB96138-19	Ground Water	Hexavalent Chromium
FS22-GWF-40.0-44.0 (Filtered)	JB96138-19A	Ground Water	Metals
FS22-GWU-40.0-44.0 (Unfiltered)	JB96138-20	Ground Water	Hexavalent Chromium
FS22-GWU-40.0-44.0 (Unfiltered)	JB96138-20A	Ground Water	Metals

The samples were collected following the procedures detailed in the Forrest Street Additional Remedial Investigation Work Plan dated April 27, 2015

General Comments

The data package was complete. Quality control (QC) issues identified during validation are discussed below. Refer to the Target Analyte Summary Hit(s) in Attachment A for a listing of all detected results, qualified results, and associated qualifications, where applicable. The nonconformances for each section discussed below are presented in Attachment B.

Hexavalent Chromium

MS Results

Soil

Sample FS22-10.0-10.5 (JB96138-2) was selected for the soil matrix spike (MS) analysis and was used for supporting data quality recommendations. The soluble and insoluble MS recoveries (%Rs) from the initial batch were 82.9% and 97.9%, respectively which met the quality control (QC) criteria of 75-125%R. The post digestion spike (PDS) recovery was 101%, which met the PDS criteria of 85-115%. No qualifications were required based on the soil MS criteria.

Groundwater

Filtered sample FS22-GWF-40.0-44.0 (JB96138-19) was used as a source sample for the MS analysis in this SDG. The initial MS recovery was 93.3% which met the QC requirements of 85-115%R. No data qualification was necessary on this basis.

Unfiltered sample FS22-GWU-40.0-44.0 (JB96138-20) was also selected as a source sample for the MS analysis in this SDG. The initial MS recovery was 13.5% which did not meet the QC requirements of 85-115%R. The PDS recovery was 14.7%, which did not meet the PDS criteria of 85-115%. The hexavalent chromium result in the unfiltered sample FS22-GWU-40.0-44.0 was detected between the MDL and RL, and was rejected (R).

Field Duplicate Results

Samples FS22-12.0-12.5 and FS22-12.0-12.5X were collected as the field duplicate (FD) pair in this SDG. Hexavalent chromium met the precision criteria of absolute difference less than or equal to the reporting limit (RL) for sample results $\leq 5 \times \text{RL}$.

Sample Results

Hexavalent chromium results (flagged B by the laboratory) that were less than the RL, but greater than or equal to the method detection limit (MDL) are approximate values and have been qualified as estimated (J).

Metals

Method Blank

Negative instrument drift was detected for thallium in the MB associated with the soils samples collected in SDG. The potential for falsely nondetect and bias low sample results exist for several soil samples; therefore, the nondetect thallium results in all the soil samples were qualified as estimated (UJ).

Field Blank

Nickel was detected in the Field Blank FB-20150603 at a concentration greater than the MDL, but less than the RL; however, nickel was detected in all the soil samples at concentrations greater than ten times the amount in the field blank; therefore, no qualifications were required.

Matrix Spike/Matrix Spike Duplicate (MS/MSD)

Site sample FS22-GWF-40.0-44.0 (JB96138-19A) was used for the MS/MSD analysis in association with the aqueous sample FS22-GWF-40.0-44.0 collected in this SDG. All QC criteria were met, thus no qualifications were required.

Site sample FS22-GWU-40.0-44.0 (JB96138-20A) was used for the MS/MSD analysis in association with the aqueous sample FS22-GWU-40.0-44.0 collected in this SDG. The MS and MSD for antimony were recovered at levels less than 75% indicating possible matrix interferences and the potential for biased low sample results. Therefore, the antimony result in sample FS22-GWU-40.0-44.0 was qualified (UJ) as estimated with the potential for low bias.

Site sample FS22-10.0-10.5 (JB96138-2A) was used for the MS/MSD analysis in association with the soil samples collected in this SDG. The MS and MSD for antimony were recovered at levels less than 75% indicating possible matrix interferences and the potential for biased low sample results. Therefore,

the antimony result in all the soil samples were qualified (UJ) as estimated with the potential for low bias.

Field Duplicate Results

Samples FS22-12.0-12.5 and FS22-12.0-12.5X were collected as the field duplicate pair in this SDG. The relative percent differences (RPDs) for chromium, vanadium, and nickel exceeded the QC %RPD criteria; therefore, the sample results for these analytes in all the soil samples were qualified as estimated (J).

Serial Dilution

The percent difference (%D) for chromium in the serial dilution on sample FS22-GWU-40.0-44.0 (JB96138-20A) exceeded the QC limits of 10% and the sample concentration was greater than 10xRL; therefore, the chromium result in sample FS22-GWU-40.0-44.0 (JB96138-20A) was qualified as estimated (J).

Sample Results

The metals results (flagged B by the laboratory) that were less than the RL, but greater than or equal to the MDL are approximate values and have been qualified as estimated (J).

The concentration of total chromium was compared to the concentration of total hexavalent chromium to ensure that the total chromium concentration was greater than the total hexavalent chromium concentration. No data were qualified on this basis.

Data Quality and Usability

In general, these data appear to be valid and may be used for decision-making purposes. The hexavalent chromium result in the unfiltered sample FS22-GWU-40.0-44.0 was rejected. Qualified results are presented in Attachments A and B.

The hexavalent chromium result in the unfiltered sample FS22-GWU-40.0-44.0 is not usable for project objectives since the result, which was detected between the MDL and RL, was rejected due to extremely low MS %R.

The nondetect thallium results are usable as estimated RL with potential low bias due to negative instrument drift.

Antimony soil and aqueous sample results qualified due to low MS/MSD recovery are usable as estimated values with low bias.

The chromium result in sample FS22-GWU-40.0-44.0 is usable as an estimated value with an unknown directional bias based on poor serial dilution results.

Sample results reported between the MDL and RL are usable as estimated values with an unknown directional bias.

Chromium, nickel, and vanadium sample results qualified due to poor field duplicate precision are usable as estimated values with an unknown directional bias.

ATTACHMENTS

Attachment A: Target Analyte Summary Hitlist(s)

Attachment B: Data Validation Report Form

Attachment A

Target Analyte Summary Hitlist(s)

Soil Target Analyte Summary Hit List Hexavalent Chromium

Site Name PPG Garfield Avenue – Forrest Street Additional Remedial Investigation (GARIS)
Sampling Date June 3, 2015
Lab Name/ID Accutest, Dayton, NJ
SDG No JB96138 and JB96138A
Sample Matrix Soil
Trip Blank ID NA
Field Blank ID FB-20150603

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
FS22-10.0-10.5	JB96138-2	CHROMIUM (HEXAVALENT)	U	3.3	3.3	0.49		
FS22-14.0-14.5	JB96138-5	CHROMIUM (HEXAVALENT)	U	0.23	0.23	0.44	Qualify	31
FS22-16.0-16.5	JB96138-6	CHROMIUM (HEXAVALENT)	U	0.24	0.24	0.47	Qualify	31
FS22-18.0-18.5	JB96138-7	CHROMIUM (HEXAVALENT)	U	2.0	2.0	0.45		
FS22-20.0-20.5	JB96138-10	CHROMIUM (HEXAVALENT)	U	0.49	0.49	0.45		
FS22-3.0-3.5	JB96138-8	CHROMIUM (HEXAVALENT)	U	1.2	1.2	0.54		
FS22-5.0-5.5	JB96138-9	CHROMIUM (HEXAVALENT)	U	0.40	0.40	0.47	Qualify	31

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

NJDEP Soil Hexavalent Chromium Laboratory Footnote

- The value reported is less than or equal to 3x the value in the preparation/reagent blank. It is the policy of NJDEP-DPFSR to negate the reported value due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
- The value reported is greater than three (3) times but less than ten (10) times the value in the preparation/reagent blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to the preparation/reagent blank contamination. The "B" qualifier alerts the end-user to the presence of this analyte in the preparation/reagent blank.

3. The value reported is less than or equal to three (3) times the value in the trip/field blank. It is the policy of NJDEP-DPFSSR to negate the reported value as due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
4. The value reported is greater than three (3) times but less than ten (10) times the value in the trip/field blanks and is considered "real". However, the reported value must be quantitatively qualified "J" due to trip/field blank contamination.
5. The concentration reported by the laboratory is incorrectly calculated.
6. The laboratory failed to report the presence of the analyte in the sample.
7. The reported Hexavalent Chromium value was qualified because the Calibration Check Standard was not within the recovery range (90-110 percent).
8. In the Duplicate Sample Analysis, Hexavalent Chromium fell outside the control limits of ≤ 20 percent for sample results $> 4xRL$ or $+ RL$ for sample results $< 4xRL$. Therefore, the result was qualified.
9. This analyte was rejected because the laboratory performed the Duplicate Analysis on a field blank.
10. The reported value was qualified because the PVS recovery was greater than 115 percent.
11. The reported value was qualified because the PVS recovery was less than 85 percent.
12. The non-detected value was qualified (UJ) because the PVS recovery was less than 85 percent. The possibility of a false negative exists.
13. The reported analyte was qualified because the associated Calibration Blank result was greater than the MDL.
14. The laboratory made a transcription error. No hits were found in the raw data.
15. This analyte is rejected because the laboratory exceeded the holding time for digestion and analysis.
16. The laboratory subtracted the preparation/reagent blank from the sample result. The Reviewer's calculation puts the preparation/reagent blank back into the result.
17. The photocopy is unreadable. Therefore, the QA reviewer cannot read the laboratory's reported concentration result.

18. The reported value was qualified because the predigestion spike recovery was less than 75 %, but greater than 50%.
19. The reported value was qualified because the predigestion spike recovery was greater than 125 percent.
20. The non-detected value was qualified (UJ) because the predigestion and or redigestion spike recovery was less than 75 percent. The possibility of a false negative exists.
21. The reported result was qualified or rejected because the laboratory did not record the pH value(s) of the sample in a laboratory notebook.
22. The reported value was qualified (J/UJ) because the sample moisture content exceeded 50 percent.
23. The sample result was rejected because the soluble and insoluble matrix spike recoveries were less than 50%.
24. The detected sample result was qualified (J) because the incorrect spike concentration was used.
25. The reported sample results were rejected because the predigestion spike recovery was greater than 150 percent.
26. The reported sample results were rejected because the redigestion spike recovery was greater than 150 percent.
27. The reported value was qualified (J) because the redigestion spike recovery was less than 75 percent.
28. The reported value was qualified (J/UJ) because the sample digestion temperature was less than 90C.
29. In the Field Duplicate Sample Analysis, Hexavalent Chromium fell outside the control limits of $\leq 50\%$ for sample results $> 5xRL$ or $+ RL$ for sample results $< 5xRL$. Therefore, the result was qualified.
30. The reported value was qualified as estimated (J/UJ) but the bias is uncertain due to both high and low MS recoveries.
31. The reported result was greater than the MDL but less than the RL and qualified (J) as estimated by the laboratory.
32. The reported value was qualified because the sample replicate precision criterion of $< 20\%$ for method 7199 was exceeded.
33. The reported value was qualified (J/UJ) because the laboratory control sample (LCS) recovery was less than 80%.

34. The reported value was qualified (J) because the laboratory control sample (LCS) recovery was greater than 120%.
35. The reported result was qualified because the matrix spike analysis was not performed at the proper frequency.
36. The reported result was qualified because the laboratory duplicate analysis was not performed at the proper frequency.
37. The result was qualified because the cooler temperature upon sample receipt exceeded 6C.
38. The reported value was qualified because the redigestion spike recovery was greater than 125 percent.
39. The reported result was rejected because the laboratory failed to perform the reanalysis due to insufficient sample volume.
40. The reported results was qualified because the laboratory failed to analyze an ending CCB.
41. The reported result was qualified because the laboratory failed to make the proper method specific pH adjustment.
42. The reported result was rejected because the laboratory failed to reanalyze the MS and associated sample(s) due to failed MS recoveries.
43. The hexavalent chromium was greater than the total chromium result and the percent difference between the results fell outside the control limits of < 20% for sample results > 4xRL or the absolute difference was greater than +/- RL for sample results < 4xRL; therefore, the hexavalent chromium result was qualified as estimated.
- 44 The reported result was qualified as estimated due to negative instrument drift.
45. The reported result was qualified because the continuing calibration verification (CCV) recovery was greater than 110%.
46. The reported value was qualified because the sample digestion temperature was not recorded on the laboratory bench sheet.

Aqueous Target Analyte Summary Hit List Hexavalent Chromium

Site Name PPG Garfield Avenue – Forrest Street Additional Remedial Investigation (GARIS)
Sampling Date June 3, 2015
Lab Name/ID Accutest, Dayton, NJ
SDG No JB96138 and JB96138A
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID FB-20150603

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
FS22-GWU-40.0-44.0	JB96138-20	CHROMIUM (HEXAVALENT)	U	0.0067	0.0067	0.010	Reject	23

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

NJDEP Aqueous Hexavalent Chromium Laboratory Footnote

- The value reported is less than or equal to 3x the value in the preparation/reagent blank. It is the policy of NJDEP-DPFSR to negate the reported value due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
- The value reported is greater than three (3) times but less than ten (10) times the value in the preparation/reagent blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to the preparation/reagent blank contamination. The "B" qualifier alerts the end-user to the presence of this analyte in the preparation/reagent blank.
- The value reported is less than or equal to three (3) times the value in the trip/field blank. It is the policy of NJDEP-DPFSR to negate the reported value as due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
- The value reported is greater than three (3) times but less than ten (10) times the value in the trip/field blanks and is considered "real". However, the reported value must be quantitatively qualified "J" due to trip/field blank contamination.
- The concentration reported by the laboratory is incorrectly calculated.

6. The laboratory failed to report the presence of the analyte in the sample.
7. The reported value was qualified because the Calibration Verification Standard was not within the recovery range (90-110 percent).
8. In the MS/MSD Sample Analysis, this analyte fell outside the control limits of 20% RPD. Therefore, the result was qualified.
9. This analyte was qualified because the laboratory performed the MS/MSD Analysis on a field blank.
10. The reported analyte was qualified because the associated Calibration Blank result was greater than the MDL.
11. This analyte is rejected or qualified because the laboratory exceeded the holding time for digestion and analysis.
12. The laboratory subtracted the method blank from the sample result. The reviewer's calculation has added the method blank result to the reported concentration.
13. The photocopy submitted is illegible. Therefore, the QA reviewer cannot read the laboratory's reported concentration result.
14. The reported or nondetected value was qualified because the MS/MSD spike recovery was less than 75 percent, but greater than 50%.
15. The reported value was qualified because the MS/MSD spike recovery was greater than 125 percent.
16. The reported value was qualified as estimated (J/UJ) but the bias is uncertain due to both high and low MS recoveries.
17. The reported values were qualified because the laboratory duplicate exceeded 20 percent RPD or the absolute difference exceeded the reporting limit for sample results < 4X the reporting limit.
18. The reported value(s) was qualified as estimated (J) because the field duplicate RPD was >30% for SR<5xRL, or the absolute difference was >RL for SR <RL, in which case the reported value(s) were estimated (J) positive and nondetects (UJ).
19. The reported value was qualified because the LCS recovery was less than 80 percent.
20. The reported result was greater than the MDL but less than the RL and qualified (J) as estimated by the laboratory.
21. The reported value was qualified because the LCS recovery was greater than 120 percent.
22. The reported value was qualified because of negative instrument drift.

23. The dissolved result was > the total result and the relative percent difference between the total and dissolved results fell outside the control limits of < 20% for sample results > 4xRL or absolute difference of +/- RL for sample results < 4xRL. Therefore, the results in both the total and dissolved fractions were qualified.
24. The dissolved hexavalent chromium result was > the dissolved chromium result or the total hexavalent chromium result was > the total chromium result and the relative percent difference between the total and dissolved results fell outside the control limits of < 20% for sample results > 4xRL or absolute difference of +/- RL for sample results < 4xRL. Therefore, the results were qualified.
23. The nondetected value was rejected, but the detect value was estimated because the MS/MSD spike recovery was less than 50 percent.

Soil Target Analyte Summary Hit List (Metals)

Site Name PPG Garfield Avenue – Forrest Street Additional Remedial Investigation (GARIS)
Sampling Date June 3, 2015
Lab Name/ID Accutest, Dayton, NJ
SDG No JB96138A
Sample Matrix Soil
Trip Blank ID NA
Field Blank ID FB-20150603

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
FS22-20.0-20.5	JB96138-10A	CHROMIUM	U	20.6	20.6	1.1	Qualify	19
FS22-22.0-22.5	JB96138-11A	CHROMIUM	U	14.2	14.2	1.2	Qualify	19
FS22-24.0-24.5	JB96138-12A	CHROMIUM	U	15.5	15.5	1.1	Qualify	19
FS22-26.0-26.5	JB96138-13A	CHROMIUM	U	16.0	16.0	1.1	Qualify	19
FS22-28.0-28.5	JB96138-14A	CHROMIUM	U	9.6	9.6	1.0	Qualify	19
FS22-30.0-30.5	JB96138-15A	CHROMIUM	U	8.6	8.6	1.2	Qualify	19
FS22-32.0-32.5	JB96138-16A	CHROMIUM	U	8.3	8.3	1.2	Qualify	19
FS22-34.0-34.5	JB96138-17A	CHROMIUM	U	6.2	6.2	1.2	Qualify	19
FS22-35.0-35.5	JB96138-18A	CHROMIUM	U	11.7	11.7	0.98	Qualify	19
FS22-10.0-10.5	JB96138-2A	CHROMIUM	U	54.7	54.7	1.2	Qualify	19
FS22-12.0-12.5	JB96138-3A	CHROMIUM	U	9.7	9.7	1.2	Qualify	19
FS22-12.0-12.5X	JB96138-4A	CHROMIUM	U	28.2	28.2	1.2	Qualify	19
FS22-14.0-14.5	JB96138-5A	CHROMIUM	U	24.7	24.7	1.1	Qualify	19
FS22-16.0-16.5	JB96138-6A	CHROMIUM	U	16.4	16.4	1.2	Qualify	19
FS22-18.0-18.5	JB96138-7A	CHROMIUM	U	20.2	20.2	1.1	Qualify	19
FS22-3.0-3.5	JB96138-8A	CHROMIUM	U	18.0	18.0	1.0	Qualify	19
FS22-5.0-5.5	JB96138-9A	CHROMIUM	U	18.3	18.3	1.2	Qualify	19
FS22-20.0-20.5	JB96138-10A	NICKEL	U	8.8	8.8	4.4	Qualify	19

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
FS22-22.0-22.5	JB96138-11A	NICKEL	U	9.7	9.7	4.7	Qualify	19
FS22-24.0-24.5	JB96138-12A	NICKEL	U	10.6	10.6	4.5	Qualify	19
FS22-26.0-26.5	JB96138-13A	NICKEL	U	11.9	11.9	4.3	Qualify	19
FS22-28.0-28.5	JB96138-14A	NICKEL	U	7.0	U	4.1	Qualify	19
FS22-30.0-30.5	JB96138-15A	NICKEL	U	3.8	U	5.0	Qualify	19,22
FS22-32.0-32.5	JB96138-16A	NICKEL	U	6.2	U	4.7	Qualify	19
FS22-34.0-34.5	JB96138-17A	NICKEL	U	4.1	U	4.7	Qualify	19,22
FS22-35.0-35.5	JB96138-18A	NICKEL	U	6.3	U	3.9	Qualify	19
FS22-10.0-10.5	JB96138-2A	NICKEL	U	15.6	15.6	4.7	Qualify	19
FS22-12.0-12.5	JB96138-3A	NICKEL	U	8.9	8.9	4.6	Qualify	19
FS22-12.0-12.5X	JB96138-4A	NICKEL	U	16.4	16.4	4.8	Qualify	19
FS22-14.0-14.5	JB96138-5A	NICKEL	U	17.4	17.4	4.3	Qualify	19
FS22-16.0-16.5	JB96138-6A	NICKEL	U	11.5	11.5	4.8	Qualify	19
FS22-18.0-18.5	JB96138-7A	NICKEL	U	15.7	15.7	4.4	Qualify	19
FS22-3.0-3.5	JB96138-8A	NICKEL	U	16.6	16.6	4.0	Qualify	19
FS22-5.0-5.5	JB96138-9A	NICKEL	U	13.0	13.0	4.7	Qualify	19
FS22-20.0-20.5	JB96138-10A	THALLIUM	U	U	U	1.1	Qualify	24
FS22-22.0-22.5	JB96138-11A	THALLIUM	U	U	U	1.2	Qualify	24
FS22-24.0-24.5	JB96138-12A	THALLIUM	U	U	U	1.1	Qualify	24
FS22-26.0-26.5	JB96138-13A	THALLIUM	U	U	U	1.1	Qualify	24
FS22-28.0-28.5	JB96138-14A	THALLIUM	U	U	U	1.0	Qualify	24
FS22-30.0-30.5	JB96138-15A	THALLIUM	U	U	U	1.2	Qualify	24
FS22-32.0-32.5	JB96138-16A	THALLIUM	U	U	U	1.2	Qualify	24
FS22-34.0-34.5	JB96138-17A	THALLIUM	U	U	U	1.2	Qualify	24
FS22-35.0-35.5	JB96138-18A	THALLIUM	U	U	U	0.98	Qualify	24
FS22-10.0-10.5	JB96138-2A	THALLIUM	U	U	U	1.2	Qualify	24

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
FS22-12.0-12.5	JB96138-3A	THALLIUM	U	U	U	1.2	Qualify	24
FS22-12.0-12.5X	JB96138-4A	THALLIUM	U	U	U	1.2	Qualify	24
FS22-14.0-14.5	JB96138-5A	THALLIUM	U	U	U	1.1	Qualify	24
FS22-16.0-16.5	JB96138-6A	THALLIUM	U	U	U	1.2	Qualify	24
FS22-18.0-18.5	JB96138-7A	THALLIUM	U	U	U	1.1	Qualify	24
FS22-3.0-3.5	JB96138-8A	THALLIUM	U	U	U	1.0	Qualify	24
FS22-5.0-5.5	JB96138-9A	THALLIUM	U	U	U	1.2	Qualify	24
FS22-20.0-20.5	JB96138-10A	VANADIUM	U	15.5	15.5	5.5	Qualify	19
FS22-22.0-22.5	JB96138-11A	VANADIUM	U	20.8	20.8	5.8	Qualify	19
FS22-24.0-24.5	JB96138-12A	VANADIUM	U	23.2	23.2	5.6	Qualify	19
FS22-26.0-26.5	JB96138-13A	VANADIUM	U	23.2	23.2	5.4	Qualify	19
FS22-28.0-28.5	JB96138-14A	VANADIUM	U	15.4	15.4	5.1	Qualify	19
FS22-30.0-30.5	JB96138-15A	VANADIUM	U	10.8	10.8	6.2	Qualify	19
FS22-32.0-32.5	JB96138-16A	VANADIUM	U	12.7	12.7	5.8	Qualify	19
FS22-34.0-34.5	JB96138-17A	VANADIUM	U	11.4	11.4	5.9	Qualify	19
FS22-35.0-35.5	JB96138-18A	VANADIUM	U	12.5	12.5	4.9	Qualify	19
FS22-10.0-10.5	JB96138-2A	VANADIUM	U	44.8	44.8	5.9	Qualify	19
FS22-12.0-12.5	JB96138-3A	VANADIUM	U	16.4	16.4	5.8	Qualify	19
FS22-12.0-12.5X	JB96138-4A	VANADIUM	U	49.4	49.4	6.0	Qualify	19
FS22-14.0-14.5	JB96138-5A	VANADIUM	U	36.1	36.1	5.3	Qualify	19
FS22-16.0-16.5	JB96138-6A	VANADIUM	U	16.7	16.7	5.9	Qualify	19
FS22-18.0-18.5	JB96138-7A	VANADIUM	U	27.4	27.4	5.5	Qualify	19
FS22-3.0-3.5	JB96138-8A	VANADIUM	U	25.7	25.7	5.0	Qualify	19
FS22-5.0-5.5	JB96138-9A	VANADIUM	U	30.8	30.8	5.9	Qualify	19
FS22-20.0-20.5	JB96138-10A	ANTIMONY	U	U	U	2.2	Qualify	15
FS22-22.0-22.5	JB96138-11A	ANTIMONY	U	U	U	2.3	Qualify	15

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
FS22-24.0-24.5	JB96138-12A	ANTIMONY	U	U	U	2.3	Qualify	15
FS22-26.0-26.5	JB96138-13A	ANTIMONY	U	U	U	2.2	Qualify	15
FS22-28.0-28.5	JB96138-14A	ANTIMONY	U	U	U	2.0	Qualify	15
FS22-30.0-30.5	JB96138-15A	ANTIMONY	U	U	U	2.5	Qualify	15
FS22-32.0-32.5	JB96138-16A	ANTIMONY	U	U	U	2.3	Qualify	15
FS22-34.0-34.5	JB96138-17A	ANTIMONY	U	U	U	2.3	Qualify	15
FS22-35.0-35.5	JB96138-18A	ANTIMONY	U	U	U	2.0	Qualify	15
FS22-10.0-10.5	JB96138-2A	ANTIMONY	U	U	U	2.4	Qualify	15
FS22-12.0-12.5	JB96138-3A	ANTIMONY	U	U	U	2.3	Qualify	15
FS22-12.0-12.5X	JB96138-4A	ANTIMONY	U	U	U	2.4	Qualify	15
FS22-14.0-14.5	JB96138-5A	ANTIMONY	U	U	U	2.1	Qualify	15
FS22-16.0-16.5	JB96138-6A	ANTIMONY	U	U	U	2.4	Qualify	15
FS22-18.0-18.5	JB96138-7A	ANTIMONY	U	U	U	2.2	Qualify	15
FS22-3.0-3.5	JB96138-8A	ANTIMONY	U	U	U	2.0	Qualify	15
FS22-5.0-5.5	JB96138-9A	ANTIMONY	U	U	U	2.4	Qualify	15

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

NJDEP Soil Metals Laboratory Footnotes

1. The value reported is less than or equal to 3x the value in the method blank. It is the policy of NJDEP-DPFSR to negate the reported value due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
2. The value reported is greater than three (3) but less than ten (10) times the value in the method blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to the method blank contamination. The "B" qualifier alerts the end-user to the presence of this analyte in the method blank.

3. The value reported is less than or equal to 3x the value in the trip/field blank. It is the policy of NJDEP-DPF SR to negate the reported value as due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
4. The value reported is greater than 3x but less than ten (10) the value in the trip/field blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to trip/field blank contamination.
5. The concentration reported by the laboratory is incorrectly calculated.
6. The laboratory failed to report the presence of the analyte in the sample.
7. The reported metal value was qualified because the Calibration Verification Standard was not within the recovery range (90-110 percent).
8. In the MS/MSD Sample Analysis, this analyte fell outside the control limits of 20% RPD. Therefore, the result was qualified.
9. This analyte was qualified because the laboratory performed the MS/MSD Analysis on a field blank.
10. The reported analyte was qualified because the associated Calibration Blank result was greater than the MDL.
11. The reported value was qualified because serial dilution analysis was not within QC limit of 10% D.
12. This analyte is qualified or rejected because the laboratory exceeded the holding time for digestion and analysis.
13. The laboratory subtracted the method blank from the sample result. The reviewer's calculation has added the method blank result to the reported concentration.
14. The photocopy submitted is illegible. Therefore, the QA reviewer cannot read the laboratory's reported concentration result.
15. The reported or nondetected value was qualified because the MS/MSD spike recovery was less than 75 percent.
16. The reported value was qualified because the MS/MSD spike recovery was greater than 125 percent.
17. The reported value was qualified as estimated (J/UJ) but the bias is uncertain due to both high and low MS recoveries.
18. The reported values were qualified because the laboratory duplicate exceeded 35 percent RPD or the absolute difference exceeded the reporting limit for sample results < 5X the reporting limit.

19. The reported value was qualified because the field duplicate exceeded 50 percent RPD for results > 5X the reporting limit.
20. The reported value was qualified because the LCS recovery was less than 80 percent.
21. The reported value was qualified because the sample moisture content was greater than 50 percent.
22. The reported result was greater than the MDL but less than the RL and qualified (J) as estimated by the laboratory.
23. The reported value was qualified because the LCS recovery was greater than 120 percent.
24. The reported value was qualified because of negative instrument drift.
25. The hexavalent chromium was greater than the total chromium result and the percent difference between the results fell outside the control limits of < 20% for sample results > 4xRL or the absolute difference was greater than +/- RL for sample results < 4xRL; therefore, the chromium result was qualified as estimated.

Aqueous Target Analyte Summary Hit List (Metals)

Site Name PPG Garfield Avenue – Forrest Street Additional Remedial Investigation (GARIS)
Sampling Date June 1, 2015
Lab Name/ID Accutest, Dayton, NJ
SDG No JB96138 and JB96138A
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID FB-20150603

Field Sample ID	Lab Sample ID	Analyte	Method Blank (µg/l)	Laboratory Sample Result (µg/l)	Validation Sample Result (µg/l)	RL (µg/l)	Quality Assurance Decision	NJDEP Validation Footnote
FS22-GWU-40.0-44.0	JB96138-20A	ANTIMONY	U	U	U	30	Qualify	15
FS22-GWF-40.0-44.0	JB96138-19A	CHROMIUM	U	0.90	0.90	10	Qualify	22
FS22-GWU-40.0-44.0	JB96138-20A	CHROMIUM	U	1600	1600	50		
FB-20150603	JB96138-1A	NICKEL	U	2.4	2.4	10	Qualify	22
FS22-GWF-40.0-44.0	JB96138-19A	NICKEL	U	4.5	4.5	10	Qualify	22
FS22-GWU-40.0-44.0	JB96138-20A	NICKEL	U	642	642	50		
FS22-GWF-40.0-44.0	JB96138-19A	VANADIUM	U	0.70	0.70	50	Qualify	22
FS22-GWU-40.0-44.0	JB96138-20A	VANADIUM	U	574	574	250		

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

Aqueous Metals NJDEP Laboratory Footnotes

1. The value reported is less than or equal to 3x the value in the method blank. It is the policy of NJDEP-DPF SR to negate the reported value due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
2. The value reported is greater than three (3) but less than ten (10) times the value in the method blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to the method blank contamination. The "B" qualifier alerts the end-user to the presence of this analyte in the method blank.

3. The value reported is less than or equal to 3x the value in the trip/field blank. It is the policy of NJDEP-DPFSR to negate the reported value as due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
4. The value reported is greater than 3x but less than ten (10) the value in the trip/field blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to trip/field blank contamination.
5. The concentration reported by the laboratory is incorrectly calculated.
6. The laboratory failed to report the presence of the analyte in the sample.
7. The reported metal value was qualified because the Calibration Verification Standard was not within the recovery range (90-110 percent).
8. In the MS/MSD Sample Analysis, this analyte fell outside the control limits of 20% RPD. Therefore, the result was qualified.
9. This analyte was qualified because the laboratory performed the MS/MSD Analysis on a field blank.
10. The reported analyte was qualified because the associated Calibration Blank result was greater than the MDL.
11. The reported value was qualified because serial dilution analysis was not within QC limit of 10% D.
12. This analyte is rejected or qualified because the laboratory exceeded the holding time for digestion and analysis.
13. The laboratory subtracted the method blank from the sample result. The reviewer's calculation has added the method blank result to the reported concentration.
14. The photocopy submitted is illegible. Therefore, the QA reviewer cannot read the laboratory's reported concentration result.
15. The reported or nondetected value was qualified because the MS/MSD spike recovery was less than 75 percent for metals or less than 90% for wet chem.
16. The reported value was qualified because the MS/MSD spike recovery was greater than 125 percent for metals or greater than 110% for wet chem.
17. The reported value was qualified as estimated (J/UJ) but the bias is uncertain due to both high and low MS recoveries.

18. The reported values were qualified because the laboratory duplicate exceeded 20 percent RPD or the absolute difference exceeded the reporting limit for sample results < 5X the reporting limit.
19. The reported value(s) was qualified as estimated (J) because the field duplicate RPD was >30% for SR<5xRL, or the absolute difference was >RL for SR <RL, in which case the reported value(s) were estimated (J) positive and nondetects (UJ).
20. The reported value was qualified because the LCS recovery was less than 80 percent.
21. The reported value was qualified because the sample moisture content was greater than 50 percent.
22. The reported result was greater than the MDL but less than the RL and qualified (J) as estimated by the laboratory.
23. The reported value was qualified because the LCS recovery was greater than 120 percent.
24. The reported value was qualified because of negative instrument drift.
25. The reported value was qualified as estimated (J/UJ) but the bias is uncertain due to either an acceptable MS recovery and high or low MSD recovery, or acceptable MSD recovery and a high or low MS recovery.
26. The dissolved result was > the total result and the relative percent difference between the total and dissolved results fell outside the control limits of < 20% for sample results > 4xRL or absolute difference of +/- RL for sample results < 4xRL. Therefore, the results in both the total and dissolved fractions were qualified.
27. The dissolved hexavalent chromium result was > the dissolved chromium result or the total hexavalent chromium result was > the total chromium result and the relative percent difference between the total and dissolved results fell outside the control limits of < 20% for sample results > 4xRL or absolute difference of +/- RL for sample results < 4xRL. Therefore, the results were qualified.

Attachment B

Data Validation Report Form

Client Name: PPG Industries	Project Number: 60279173.GA.RI.RPT.FOR
Site Location: PPG Garfield Avenue – Forrest Street Additional Remedial Investigation (GARIS)	Project Manager: Bill Spronz
Laboratory: Accutest, Dayton, NJ	Type of Validation: Full
Laboratory Job No: JB96138, JB96138A	Date Checked: 7/15/2015
Validator: Charlene Flint	Peer: Lisa Krowitz

ITEM	YES	NO	N/A	COMMENTS
Sample results included?	X			
Reporting Limits met project requirements?	X			
Field I.D. included?	X			
Laboratory I.D. included?	X			
Sample matrix included?	X			
Sample receipt temperature 2-6°C?	X			3.7 C
Signed COCs included?	X			
Date of sample collection included?	X			
Date of sample digestion included?	X			
Holding time to digestion met criteria? (Soils -30 days from collection to digestion.)	X			
Date of analysis included?	X			
Holding time to analysis met criteria? (Soils -168 hours from digestion to analysis; Aqueous - 24 hours from collection to analysis.)	X			
Method reference included?	X			
Laboratory Case Narrative included?	X			

Definitions: MDL Method Detection Limit; %R Percent Recovery; RL Reporting Limit; RPD Relative Percent Difference; RSD Relative Standard Deviation :Corr Correlation Coefficient.

ITEM	YES	NO	N/A	COMMENTS
Initial calibration documentation included in lab package?	X			
1) Blank plus 4 standards (7196A) or blank plus 3 standards (7199)	X			
2) Correlation coefficient of =0.995 (7196A) or =0.999 (7199)	X			
3) Calibrate daily or each time instrument is set up.	X			
Calibration Check Standard (CCS) for 7196A and Quality Control Sample (QCS) for 7199 Included in Lab Package?	X			
1) %R criteria met? (90 - 110%)	X			
2) Correct frequency of one per every 10 samples	X			
3) CCS and QCS from independent source and at mid-level of calibration curve	X			
Calibration Blanks	X			
1) Analyzed prior to initial calibration standards and after each CCS/QCS?	X			
2) Absolute value should not exceed MDL.	X			
Method Blank, Field Blanks and/or Equipment Blanks Included in Lab Package?	X			
1) Method blank analyzed with each preparation batch?	X			
2) Absolute value should not exceed MDL.	X			
Eh and pH Data	X			
1) Eh and pH data was included and plotted for all samples?	X			
Soluble Matrix Spike Data Included in Lab Package?	X			JB96138-2 (s), JB96138-19 (aq) and JB96138-20 (aq)
1) Soluble Matrix %R criteria met? (75-125%R).		X		See nonconformance table JB96138-20 low
2) Was the spike concentration 40 mg/Kg or twice the sample concentration?	X			Soil spiked at 48.7 mg/l. Aqueous spiked at 0.150 mg/l.
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	X			
Insoluble Matrix Spike Data Included in Lab Package?	X			
1) Insoluble Matrix %R criteria met? (75-125%R).	X			
2) Was the spike concentration around 400 to 800 mg/Kg?		X		Spiked at 1120 mg/kg. No impact on data.
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	X			

ITEM	YES	NO	N/A	COMMENTS
Post Digestion Spike	X			
1) Post Digestion Spike %R criteria met? (85-115%R).	X			
2) Was the spike concentration 40 mg/Kg or twice the sample concentration?	X			
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	X			
Sample Duplicate Data Included in Lab Package?	X			JB96138-2, JB96138-19 and JB96138-20
1) RPD criteria met? (RPD ≤ 20%) if both results are ≤4x RL or absolute difference ≤ RL if either or both results are <4xRL	X			JB96138-20 <4x RL, abs diff <RL
2) Was a sample duplicate analyzed at the frequency of 1 per batch or 20 samples?	X			
Was a Laboratory Control Sample (LCS) Included in Lab Package?	X			
1) %R criteria met? (80-120%R).	X			
2) Was an LCS analyzed at the frequency of 1/batch or 20 samples?	X			
Were any Field Duplicate samples submitted with this SDG?	X			JB96138-3 & JB96138-4
1) Were Field duplicate RPD criteria met? (RPD≤50% for both sample results >5xRL or professional judgement if either or both results are <5xRL.	X			
Were all sample quantitation and reporting requirements met?	X			
1) Were all solid samples reported with percent solids > 50%?	X			
2) Were any samples analyzed or reported with dilutions?		X		
Miscellaneous Items	X			
1) For soils by 7196A, was the pH within a range of 7.0-8.0?	X			
2) For soils by 7199, was the pH within a range of 9.0-9.5?			X	
3) For aqueous by 7196A, was the pH with a range of 1.5-2.5?	X			
4) For soils (3060A), was the digestion temperature 90-95C for at least 60 minutes?	X			
5) For 7199, was each sample injected twice and was the RPD =20?			X	

SDG#: JB96138/ Method 7196

Batch: GN27171

Cr+6 ICAL 6/15/15

Soil

(p. 81 of data pkg)

x - concentration	y - response
0	0
0.01	0.010
0.05	0.044
0.1	0.086
0.3	0.258
0.5	0.430
0.8	0.673
1	0.829

(p. 81 of data pkg)

AECOM Calculated Offset	0.0038	OK	Reported Offset	0.0038
AECOM Slope	0.8332	OK	Reported Slope	0.8332
AECOM Calculated r	0.99986	OK	Reported r	0.99986

LCS calculation

GP89800-B1

P. 55,81

Background Absorbance	0
Total absorbance	0.763
Total absorbance - background	0.763
Instrument Concentration	0.911
Sample weight (mg/kg)	0.0025
Final Volume (L)	0.1
Dilution Factor	1

AECOM Calculated LCS Result (mg/Kg)	36.4	OK	Reported Result (mg/Kg)	36.4
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%R = Found/True*100

GP89800-B1

P. 55,81

True Value (mg/kg)	40
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AECOM Calculated %R	91.1	OK, rounding	Reported %R	91.0
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MS calculation

GP89800-S1

P. 57,58,81

JB96138-2

Background reading	0.004
Total absorbance	0.755
Total absorbance - background	0.751
Instrument Concentration	0.8968
Sample weight (mg/kg)	0.0025
Final Volume (L)	0.1
Percent solids	0.821
Dilution Factor	1

AECOM Calculated MS Result (mg/Kg)	43.7	OK	Reported Result (mg/Kg)	43.7
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%R = Found/True*100

GP89800-S1

P. 57,58,81

JB96138-2

True Value (mg/kg)	48.7
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Native concentration (mg/Kg)	3.3
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AECOM %R	82.9	OK	Reported %R	82.9
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Percent Solids

JB96138-2

P. 58

FS22-10.0-10.5

Empty dish weight=	24.31
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Wet weight=	30.57
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Dry weight=	29.45
-------------	-------

AECOM %solids =	82.1	OK	Reported %solids=	82.1
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Reporting Limit	JB96138-2	P. 13,58,81	FS22-10.0-10.5
Low Standard	0.01		
Initial weight (mg/kg)	0.0025		
Final volume (L)	0.1		
Percent solids	0.821		
Dilution Factor	1		
Reporting Limit	0.49	OK	Reported RL (mg/Kg)= 0.49

Sample Calculations	JB96138-2	P. 13,58,81	FS22-10.0-10.5
Background reading	0.005		
Total absorbance	0.066		
Total absorbance - background	0.061		
Instrument Response	0.069		
Sample weight (mg/kg)	0.00256		
Final Volume (L)	0.1		
Percent solids	0.821		
Dilution Factor	1		
AECOM Calculated Result (mg/Kg)	3.3	OK	Reported Result (mg/Kg) 3.3

SDG#: JB96138/ Method 7196

Batch: GN26551

Cr+6 ICAL 06/04/15

Aqueous

(p. 62 of data pkg)

x - concentration	y - response
0	0
0.01	0.01
0.05	0.043
0.1	0.088
0.3	0.258
0.5	0.422
0.8	0.676
1	0.839

(p. 62 of data pkg)

AECOM Calculated Offset	0.0024	OK	Reported Offset	0.0024
AECOM Slope	0.8394	OK	Reported Slope	0.8394
AECOM Calculated r	0.99997	OK	Reported r	0.99997

LCS calculation

GN26551-B1

P. 55,62

Background Absorbance

0

Total absorbance

0.126

Total absorbance - background

0.126

Instrument Concentration

0.147

Sample weight (mg/l)

0.05

Final Volume (L)

0.05

Dilution Factor

1

AECOM Calculated LCS Result (mg/l)	0.15	OK	Reported Result (mg/l)	0.15
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%R = Found/True*100

GN26551-B1

P. 55,62

True Value (mg/l)

0.15

AECOM Calculated %R	98	OK, rounding	Reported %R	100
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MS calculation

GN26551-S2

P. 57,62

JB96138-19

Background reading

0.001

Total absorbance

0.125

Total absorbance - background

0.124

Instrument Concentration

0.1449

Sample weight (mg/l)

0.05

Final Volume (L)

0.05

Dilution Factor

1

AECOM Calculated MS Result (mg/l)	0.14	OK	Reported Result (mg/l)	0.14
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%R = Found/True*100

GN26551-S2

P. 57,62

JB96138-19

True Value (mg/l)

0.15

Native concentration (mg/l)

0

AECOM %R	93.3	OK	Reported %R	93.3
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Reporting Limit

JB96138-19

P. 30,62

JB96138-19

Low Standard

0.01

Initial weight (mg/l)

0.05

Final volume (L)

0.05

Dilution Factor

1

Reporting Limit	0.010	OK	Reported RL (mg/l)=	0.010
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<u>Sample Calculations</u>	JB96138-19	P. 30,62	JB96138-19
Background reading	0.001		
Total absorbance	0.002		
Total absorbance - background	0.001		
Instrument Response	-0.002		
Sample weight (mg/l)	0.05		
Final Volume (L)	0.05		
Dilution Factor	1		
AECOM Calculated Result (mg/l)	-0.002	OK <0.0031	Reported Result (mg/l) 0.0031 U

Nonconformance Tables**Matrix Spikes**

Sample ID	Lab ID	Analyte	% Recovery	Lower Limit	Upper Limit
FS22-GWU-40.0-44.0	JB96138-20	CHROMIUM (HEXAVALENT)	13.5	85	115

Lab Duplicates

Sample ID	Lab ID	Analyte	Sample Result	Qual	Duplicate Result	Qual	QL	Units	RPD
FS22-GWU-40.0-44.0	JB96138-20	CHROMIUM (HEXAVALENT)	0.0067	B	0.0091		0.010	mg/l	NC. SR<4xRL and absolute difference <RL

Client Name: PPG Industries	Project Number: 60279173.GA.RI.RPT.FOR
Site Location: PPG Garfield Avenue – Forrest Street Additional Remedial Investigation (GARIS)	Project Manager: Bill Spronz
Laboratory: Accutest, Dayton, NJ	Type of Validation: Limited
Laboratory Job No: JB96138, JB96138A	Date Checked: 7/15/2015
Validator: Charlene Flint	Peer: Lisa Krowitz

ITEM	YES	NO	N/A	COMMENTS
Sample results included?	X			
Reporting Limits met project requirements?	X			
Field I.D. included?	X			
Laboratory I.D. included?	X			
Sample matrix included?	X			
Sample receipt temperature 2-6C?	X			3.7 C
Signed COCs included?	X			
Date of sample collection included?	X			
Date of sample digestion included?	X			
Date of analysis included?	X			
Holding time met QC criteria? (Aqueous – 28 days HCl to pH < 2, Cool, ≤ 6 °C)	X			
Method reference included?	X			
Laboratory Case Narrative included?	X			

Definitions: MDL - Method Detection Limit; %R - Percent Recovery; RL - Reporting Limit; RPD - Relative Percent Difference; RSD - Relative Standard Deviation ;Corr - Correlation Coefficient.

ITEM	YES	NO	N/A	COMMENTS
Sample dilutions?		X		
Initial calibration documentation included in lab package?			X	N/A for Limited Validation
1) Calibrate daily or each time instrument is set up.			X	
2) ICP (6010) -Blank plus 1 standard? If no, reject (R) data.			X	
3) Hg (7470/7471) -Blank plus 5 standards? If no, reject (R) data.			X	
Initial Calibration Verification Standard (ICV) for ICP (6010) and Initial Calibration Check Standard (ICCS) for Hg (7470/7471) included in lab package?			X	N/A for Limited Validation
1) Analyzed immediately after initial calibration? If no, reject (R) data.			X	
2) %R criteria met? (90-110%). If no, J positive results for affected analyte(s) if %R between 80-89% and 111-120% and indicate bias; UJ non-detect results for affected analyte(s) if %R between 80-89%, and R all data for affected analyte(s) if %R <80% or >120%.			X	
3) Spot check ICV/ICCS results for several analytes.			X	
Continuing Calibration Verification Standard (CCV) for ICP (6010) and Calibration Check Standard (CCS) for Hg (7470/7471) included in Lab Package?			X	N/A for Limited Validation
1) Analyzed immediately after each ICV/ICC/CB and after every 10 samples? If no, reject (R) data.			X	
2) CCS and CCV from independent source and at mid-level of calibration curve. If no, reject (R) data.			X	
3) %R criteria met? (90-110%R). If no, J positive results for affected analyte(s) if %R between 80-89% and 111-120% and indicate bias; UJ non-detect results for affected analyte(s) if %R between 80-89% and R all data for affected analyte(s) if %R <80% or >120%.			X	
4) Spot check CCV/CCS results for several analytes.			X	
Low Calibration Standard (CRI) included in Lab Package?			X	N/A for Limited Validation
1) %R criteria met? - 50-150% for Co, Mn, Zn, by ICP-MS; Pb, Tl by 6010; 70-130% all others. If no, refer to ILM05.4 NJ SOP 5.A.2 for actions.			X	

ITEM	YES	NO	N/A	COMMENTS
Calibration Blanks			X	N/A for Limited Validation
1) Analyzed after daily calibration and after each ICV/ICC/CCV/CCS and after every 10 samples? If no, reject (R) data.			X	
2) Absolute value <3xIDL? If no, -if sample result <10x CB result, qualify affected analyte(s) in associated samples with CB; -if sample result >10xCB result, no qualification.			X	
Method Blank Included in Lab Package?	X			
1) Method blank analyzed with each preparation batch or every SDG, or 1/20 samples? If no, reject (R) data, except no aqueous MB required for FB/EB if only soil samples were analyzed.	X			
2) Method blank analyzed 1/20 samples? If - MB 1/25, J sample results from 21-25; -MB >1/25, R sample results after 25th sample.	X			
3) MB results nondetect? If no, -sample result <3xMB, negate UB; -sample result>3xMB but <10xMB, JB; -sample result >10xMB, no qualification.		X		See nonconformance table
4) Negative MB result reported? If yes, -Positive sample result<10xMB, qualify estimated, biased low (J); -Non-detect sample result, qualify UJ, may be false non-detect.	X			See nonconformance table
Field Blanks/Equipment Blanks Included in Lab Package?	X			
1) FB/EB result non-detect? If no, -sample result <3xFB/EB, negate U; -sample result>3xFB/EB but <10xMB, J; -sample result >10xFB/EB, no qualification.		X		See nonconformance table
Interference Check Standards (ICSA and ICSB) included in Lab Package?	X			
1) Analyzed at beginning of analytical run? If no, reject (R) data.	X			
2) %R criteria met? (80-120%) If no, %R>120%, no qualification if sample result non-detect; %R between 121-150%, J positive results, biased high; %R between 50-79%, J/UJ results, biased low; %R<50% or >150%, reject (R) result	X			
3) Spot check accuracy of %Rs	X			

ITEM	YES	NO	N/A	COMMENTS
Matrix Spike/Matrix Spike Duplicate Data Included in Lab Package?	X			
1) MS/MSD %R (75-125%R) and RPD (+20% aq or 35% soils for SR>5xRL or absolute difference <RL for SR<5xRL) criteria met? - %R>125% J positive results for affected analyte(s) for all samples in the same batch, accept NDs; -%R<75% J/UJ for affected analyte(s) for all samples in the same batch; - RPD outside limits J positive results for affected analyte(s) for all samples in the same batch/SDG, accept NDs. If absolute difference >RL for SR<5xRL estimate positive results and nondetects for affected analyte(s) for all samples in the same batch. For Hg same as above except Abs Diff between MS and MSD must be ≤ 2xRL.		X		See nonconformance table
2) Was a sample spiked at the frequency of 1/batch or 20 samples?	X			
3) Was the MS performed on a site sample?	X			JB96138-19A (aq), JB98138-20A (aq) & JB98138-2A (soil)
4) Was the MS performed on a FB/EB or TB? If yes, J all sample data.		X		
Post Digestion Spike		X		
1) %R criteria met? (80-120%R) - %R>120% J positive results for affected analyte(s) for all samples in the same batch/SDG, accept NDs. - %R<80% J/UJ affected analyte(s) for all samples in the same batch.			X	
2) Was the spike performed on a FB/EB or TB? If yes, J all sample data.			X	
3) Was a sample spiked at the frequency of 1/batch or 20 samples?			X	
Laboratory Duplicate Data Included in Lab Package?	X			MS/MSD
Aqueous - If RPD is >35% for SR≤5xRL estimate (J) results.- If absolute difference is >RL for SR <RL estimate (J) positive and nondetects (UJ).- For Hg – Aq ≤ 20%,	X			
Soil -- If RPD is >50% for SR≤5xRL estimate (J) results.- If absolute difference is >RL for SR <RL estimate (J) positive and nondetects (UJ).- For Hg Soil/Sediment ≤ 35%,	X			

ITEM	YES	NO	N/A	COMMENTS
Was a Laboratory Control Sample (LCS) Included in Lab Package?	X			
1) LCS %R criteria met? (80-120%R or within vendor limits). If no, J/UJ all affected analytes(s) for all samples in the same batch/SDG.	X			
2) Was an LCS analyzed at the frequency of 1/batch or 20 samples? If no, J/UJ affected analyte(s) for all samples in the same batch/SDG.	X			
Serial Dilution	X			-19A, -20A & -2A
1) %D (<10%R) criteria met? - If analyte concentration >10xRL and %D >10% J positive results for affected analyte(s) for all samples in the same batch, accept NDs.		X		See Nonconformance Table
2) Was the frequency 1/batch or 20 samples?	X			
3) Was a site sample used?	X			
4) Was a FB/EB or TB used? If yes, J all sample data.		X		
5) Spot check accuracy of %Ds.	X			
Field Duplicate Data included in Lab Package?	X			JB98136-3 & -4
Aqueous - If RPD is >30% for SR≤5xRL estimate (J) results.- If absolute difference is >RL for SR <RL estimate (J) positive and nondetects (UJ).-			X	
Soil -- If RPD is >50% for SR≤5xRL estimate (J) results.- If absolute difference is >RL for SR <RL estimate (J) positive and nondetects (UJ).-	X			See nonconformance table
Percent Solids data included in Lab Package?	X			
1) %Solids criteria (Reg 2 criteria) met? (≥50%)	X			

Nonconformance Tables**Blanks****Batch MP87044**

Analyte	Result	3x	10x	Actions	Associated Samples
Soil Method Blank	mg/kg	mg/kg	mg/kg		
Thallium	-0.25	-0.75	-2.5	Estimate bias low (UJ)	All soil samples

Field Blanks

Blank ID	Analyte	Result	QL	Units	Actions	Associated Samples
FB-20150603	NICKEL	2.4	10	ug/l	Negate <3xFB	FS22-GWF-40.0-44.0, FS22-28.0-28.5, FS22-30.0-30.5, FS22-32.0-32.5, FS22-34.0-34.5, and FS22-35.0-35.5
					None, >10x FB	FS22-GWU-40.0-44.0
					Estimate (J)	All remaining samples

Matrix Spikes

Sample ID	Sample ID	Batch	Analyte	% MS Recovery	% MSD Recovery	Lower Limit	Upper Limit	RPD	RPD Limit	Action	Associated Samples
FS22-10.0-10.5	JB96138-2A	MP87044	ANTIMONY	54.7	53.9	75	125	1.5	20	Estimate bias low	All soil samples
FS22-GWU-40.0-44.0	JB96138-20A	MP87034	ANTIMONY	65.1	67.3	75	125	3.3	20	Estimate bias low	FS22-GWU-40.0-44.0
FS22-GWF-40.0-44.0	JB96138-19A	MP87033	ANTIMONY	96.4	96.9	75	125	0.5	20	OK	FSI10-17.0-17.5

Serial Dilution**Batch MP87034**

Analyte	Original	5x dilution	% DIF	Actions	Associated Samples
	mg/kg	mg/kg	mg/kg		
Chromium	320	373	16.6	Estimate bias low	FS22-GWU-40.0-44.0

Field Duplicate

Analyte	FS22-12.0-12.5 mg/kg	RL mg/kg	FS22-12.0-12.5X mg/kg	RL mg/kg	RPD (%)	Actions
Chromium	9.7	1.2	28.2	1.2	97.6	Estimate (J/UJ)
Nickel	8.9	4.6	16.4	4.8	Absolute difference >RL	Estimate (J/UJ)
Vanadium	16.4	5.8	49.4	6.0	100.3	Estimate (J/UJ)

Note:

NC - Not Calculated

Total Chromium vs Total Hexavalent Chromium

Sample ID	Lab Sample ID	Total Chromium (ug/l)	Total Chromium Reporting Limit (ug/l)	Total Hexavalent Chromium (ug/l)	Total Hexavalent Chromium Reporting Limit (ug/l)	Absolute Difference	RPD (%)	Action
FB-20150603	JB96138-1A	0	10	0	10	NC	NC	OK, Both ND
FS22-GWF-40.0-44.0	JB96138-19A	0.90	10	0	20	NC	NC	OK Cr>Hx
FS22-GWU-40.0-44.0	JB96138-20A	1600	50	6.7	10	NC	NC	OK Cr>Hx

Data Validation Report

Project:	PPG Garfield Avenue – Forrest Street Additional Remedial Investigation (GARIS)	
Laboratory:	Accutest, Dayton, NJ	
Laboratory Job No.:	JB96227, JB96227A	
Analysis/Method:	Hexavalent Chromium SW846 3060A/7196 Select Metals SW846 3050B/6010C	
Validation Level:	Full (Hexavalent Chromium) Limited (Antimony, Chromium, Nickel, Thallium, Vanadium)	
Site Location/Address:	90 & 98 Forrest Street Jersey City, NJ	
AECOM Project No:	60279173.GA.RI.RPT.FOR	
Prepared by:	Justin Webster /AECOM	Completed on: 7/21/2015
Reviewed by:	Lisa Krowitz/AECOM	File Name: JB96227_A_2015_7_21_DV Report-F

Introduction

The data were reviewed in accordance with the FSP-QAPP and the following NJDEP guidance documents and validation Standard Operating Procedures (SOP):

- NJDEP Office of Data Quality SOP 5.A.10, Rev 3 (September 2009), SOP for Analytical Data Validation of Hexavalent Chromium - for USEPA SW-846 Method 3060A, and USEPA SW-846 Method 7196A;
- NJDEP Office of Data Quality SOP 5.A.16, Rev 1 (May 2002), Quality Assurance Data Validation of Analytical Deliverables for Inorganics (based on USEPA SW-846 Methods)
- Data Quality Assessment and Data Usability Evaluation Technical Guidance, version 1.0, April 2014;
- Data of Known Quality Protocols Technical Guidance, version 1.0, April 2014;

The results of quality control data analyzed with site samples were used to assess the overall reliability of the data. The following qualifiers were used to identify data quality issues

- U: Indicates the analyte was not detected in the sample above the sample reporting limit.
- J: Indicates the result was an estimated value; the associated numerical value was an approximate concentration of the analyte in the sample.

- UJ: Indicates the analyte was not detected above the reporting limit and the reporting limit was approximate.
- UB: The analyte concentration is less than or equal to three (3) times the concentration in the associated method/prep blank. The presence of the analyte in the sample is negated (UB) due to laboratory contamination.
- JB: The analyte concentration is greater than three (3) times, but less than or equal to ten (10) times the concentration in the associated method/prep blank. The presence of that analyte in the sample is considered "real". The concentration is quantitatively qualified (JB) due to method blank contamination.
- R: The sample result was rejected due to serious deficiencies; the presence or absence of the analyte could not be confirmed.
- RA: The sample result was rejected but is still considered usable.

Sample Information

The samples listed below were collected by AECOM on June 4, 2015 as part of the PPG Garfield Avenue – Forrest Street Additional Remedial Investigation (GARIS) sampling at 90 & 98 Forrest Street Jersey City, NJ. Only the samples and parameters listed below were validated.

Field ID	Laboratory ID	Matrix	Fraction
FB-20150602 (Field blank)	JB96227-1,1A	Aqueous	Hexavalent Chromium, Select Metals
FB-C-20150604 (Field blank)	JB96227-2,2A	Aqueous	Hexavalent Chromium, Total Chromium
FS21-0.0-0.5	JB96227-3,3A	Soil	Hexavalent Chromium, Select Metals
FS21-2.0-2.5	JB96227-4,4A	Soil	Hexavalent Chromium, Select Metals
FS21-0.0-0.5X (Field duplicate of FS21-0.0-0.5)	JB96227-5,5A	Soil	Hexavalent Chromium, Select Metals
FS21-4.0-4.5	JB96227-6,6A	Soil	Hexavalent Chromium, Select Metals
FS21-6.0-6.5	JB96227-7,7A	Soil	Hexavalent Chromium, Select Metals
FS21-8.0-8.5	JB96227-8,8A	Soil	Hexavalent Chromium, Select Metals
FS21-10.0-10.5	JB96227-9,9A	Soil	Hexavalent Chromium, Select Metals
FS21-12.0-12.5	JB96227-10,10A	Soil	Hexavalent Chromium, Select Metals
FS21-14.0-14.5	JB96227-11,11A	Soil	Hexavalent Chromium, Select Metals
FS21-16.0-16.5	JB96227-12,12A	Soil	Hexavalent Chromium, Select Metals
FS21-18.0-18.5	JB96227-13,13A	Soil	Hexavalent Chromium, Select Metals
FS21-20.0-20.5	JB96227-14,14A	Soil	Hexavalent Chromium, Select Metals
FS21-22.0-22.5	JB96227-15,15A	Soil	Hexavalent Chromium, Select Metals
FS21-24.0-24.5	JB96227-16F,16A	Soil	Hexavalent Chromium, Select Metals
FS21-26.0-26.5	JB96227-17,17A	Soil	Hexavalent Chromium, Select Metals
FS21-28.0-28.5	JB96227-18,18A	Soil	Hexavalent Chromium, Select Metals
FS21-30.0-30.5	JB96227-19,19A	Soil	Hexavalent Chromium, Select Metals
FS21-32.0-32.5	JB96227-20,20A	Soil	Hexavalent Chromium, Select Metals
FS21-34.0-34.5	JB96227-21,21A	Soil	Hexavalent Chromium, Select Metals

Field ID	Laboratory ID	Matrix	Fraction
FS21-36.0-36.5	JB96227-22,22A	Soil	Hexavalent Chromium, Select Metals
FS21-38.0-38.5	JB96227-23,23A	Soil	Hexavalent Chromium, Select Metals
FS21-39.5-40.0	JB96227-24,24A	Soil	Hexavalent Chromium, Select Metals
FS21-GWF-40.0-44.0 (Filtered)	JB96227-25,25A	Aqueous	Hexavalent Chromium, Total Chromium
FS21-GWU-40.0-44.0 (Unfiltered)	JB96227-26,26A	Aqueous	Hexavalent Chromium, Total Chromium
FS21-CT (Concrete top)	JB96227-27,27A	Concrete	Hexavalent Chromium, Total Chromium
FS21-CB (Concrete bottom)	JB96227-28,28A	Concrete	Hexavalent Chromium, Total Chromium

The samples were collected following the procedures detailed in the Forrest Street Additional Remedial Investigation Work Plan dated April 27, 2015

General Comments

The data package was complete. Quality control (QC) issues identified during validation are discussed below. Refer to the Target Analyte Summary Hit(s) in Attachment A for a listing of all detected results, qualified results, and associated qualifications, where applicable. The nonconformances for each section discussed below are presented in Attachment B.

Hexavalent Chromium

MS Results

Concrete

Concrete sample FS21-CT (JB96227-27) was selected for the concrete matrix spike (MS) analysis and was used for supporting data quality recommendations. The soluble and insoluble MS recoveries (%Rs) from the initial batch were 95.0% and 101.2%, respectively which met the quality control (QC) criteria of 75-125%R. The post digestion spike (PDS) recovery was 96.1%, which met the PDS criteria of 85-115%. No qualifications were required based on the soil MS criteria.

Soil

Soil sample FS21-14.0-14.5 (JB96227-11) was selected for the soil matrix spike (MS) analysis and was used for supporting data quality recommendations. The soluble and insoluble MS recoveries (%Rs) from the initial batch were 83.2% and 94.1%, respectively which met the quality control (QC) criteria of 75-125%R. The post digestion spike (PDS) recovery was 100%, which met the PDS criteria of 85-115%. No qualifications were required based on the soil MS criteria.

Groundwater

Unfiltered sample FS21-GWU-40.0-44.0 (JB96227-26) was used as a source sample for the MS analysis in this SDG. The initial MS recovery was 100% which met the QC requirements of 75-125%R. No data qualification was necessary on this basis.

Filtered sample FS21-GWF-40.0-44.0 (JB96227-25) was also selected as a source sample for the MS analysis in this SDG. The initial MS recovery was 106.7% which met the QC requirements of 75-125%R. No data qualification was necessary on this basis.

Field Duplicate Results

Samples FS21-0.0-0.5 and FS21-0.0-0.5X were collected as the field duplicate (FD) pair in this SDG. Hexavalent chromium met the precision criteria of absolute difference less than the reporting limit (RL) for sample results $\leq 5 \times \text{RL}$.

Sample Results

The concentration of total chromium was compared to the concentration of hexavalent chromium to ensure that the total chromium concentration was greater than the hexavalent chromium concentration. No data were qualified on this basis.

Hexavalent chromium results (flagged B by the laboratory) that were less than the RL, but greater than or equal to the method detection limit (MDL) are approximate values and have been qualified as estimated (J).

TAL Metals

Method Blank

Negative instrument drift was detected for multiple target analytes in the MBs associated with the aqueous field blank and soil samples collected in SDG. Antimony and thallium results in the soil samples were qualified as estimated (J) and the nondetect results (UJ). Chromium, nickel, and thallium nondetect results in the aqueous samples were qualified as estimated (UJ). The potential for falsely nondetect and bias low sample results exist. Refer to Attachment B, Blanks nonconformance, and the Hits List for a listing of all negative blank results.

Matrix Spike/Matrix Spike Duplicate (MS/MSD)

Site sample FS21-14.0-14.5 (JB96227-11A) was used for the MS/MSD analysis in association with the soil samples collected in this SDG. The MS and/or MSD for antimony was recovered at levels less than 75% indicating possible matrix interferences and the potential for biased low sample results. All antimony soil sample results within this SDG were qualified (J/UJ) as estimated with the potential for low bias.

Site sample FS21-GWU-40.0-44.0 (JB96227-26A) was used for the MS/MSD analysis in association with the unfiltered aqueous samples collected in this SDG. The MS and MSD for chromium did not meet acceptable QC requirements due to matrix interferences indicating the potential for low bias sample results; therefore, chromium in sample FS21-GWU-40.0-44.0 was qualified (J), as estimated.

Field Duplicate Results

Samples FS22-0.0-0.5 and FS22-0.0-0.5X were collected as the field duplicate pair in this SDG. Antimony exceeded the acceptable precision criteria of the absolute difference less than the RL for sample results less than $5 \times \text{RL}$. Therefore, all antimony soil results were qualified (J/UJ), as estimated, with the potential for bias in an unknown direction.

Sample Results

Metals results (flagged B by the laboratory) that were less than the RL, but greater than or equal to the MDL are approximate values and have been qualified as estimated (J).

Serial Dilution

Site sample FS21-GWF-40.0-44.0 was selected by the laboratory for the serial dilution analysis. Antimony, nickel, and vanadium percent differences exceeded less than 10 percent; however, since the initial sample concentrations for antimony, nickel, and vanadium were less than 10 times the RL no data qualifications were necessary.

Site sample FS21-14.0-14.5 was also selected by the laboratory for the serial dilution analysis. Antimony and thallium percent differences exceeded less than 10 percent; however, since the initial sample concentrations for antimony and thallium were less than 10xRL no data qualifications were necessary.

Data Quality and Usability

In general, these data appear to be valid and may be used for decision-making purposes. No data were rejected. Qualified results are presented in Attachments A and B.

Antimony and thallium nondetect results in the soil samples are usable as estimated values with potential for low bias due to negative instrument drift.

Chromium, nickel, and thallium nondetect results in the aqueous samples as estimated values with potential for low bias due to negative instrument drift. The chromium result in sample FS21-GWU-40.0-44.0 is usable as an estimated value with a potential low bias based on low MS results.

Antimony results qualified due to low MS/MSD recovery are usable as estimated values with low bias.

Antimony results qualified due to poor field duplicate precision are usable as estimated values with unknown directional bias.

Sample results reported between the MDL and RL are usable as estimated values with an unknown directional bias.

ATTACHMENTS

Attachment A: Target Analyte Summary Hitlist(s)

Attachment B: Data Validation Report Form

Attachment A

Target Analyte Summary Hitlist(s)

Soil and Concrete Target Analyte Summary Hit List Hexavalent Chromium

Site Name PPG Garfield Avenue – Forrest Street Additional Remedial Investigation (GARIS)
Sampling Date June 4, 2015
Lab Name/ID Accutest, Dayton, NJ
SDG No JB96227
Sample Matrix Soil and Concrete
Trip Blank ID NA
Field Blank ID FB-20150602 (Soil) FB-C-20150604 (Concrete)

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
FS21-14.0-14.5	JB96227-11	CHROMIUM (HEXAVALENT)	U	2.3	2.3	0.45		
FS21-16.0-16.5	JB96227-12	CHROMIUM (HEXAVALENT)	U	1.3	1.3	0.45		
FS21-18.0-18.5	JB96227-13	CHROMIUM (HEXAVALENT)	U	2.4	2.4	0.44		
FS21-26.0-26.5	JB96227-17	CHROMIUM (HEXAVALENT)	U	0.33	0.33	0.53	Qualify	31
FS21-28.0-28.5	JB96227-18	CHROMIUM (HEXAVALENT)	U	0.26	0.26	0.49	Qualify	31
FS21-38.0-38.5	JB96227-23	CHROMIUM (HEXAVALENT)	U	0.47	0.47	0.49	Qualify	31
FS21-CT	JB96227-27	CHROMIUM (HEXAVALENT)	U	323	323	10		
FS21-CB	JB96227-28	CHROMIUM (HEXAVALENT)	U	0.78	0.78	0.45		
FS21-6.0-6.5	JB96227-7	CHROMIUM (HEXAVALENT)	U	0.32	0.32	0.52	Qualify	31
FS21-8.0-8.5	JB96227-8	CHROMIUM (HEXAVALENT)	U	0.34	0.34	0.54	Qualify	31
FS21-10.0-10.5	JB96227-9	CHROMIUM (HEXAVALENT)	U	0.36	0.36	0.48	Qualify	31

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

NJDEP Soil Hexavalent Chromium Laboratory Footnote

1. The value reported is less than or equal to 3x the value in the preparation/reagent blank. It is the policy of NJDEP-DPFSR to negate the reported value due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.

2. The value reported is greater than three (3) times but less than ten (10) times the value in the preparation/reagent blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to the preparation/reagent blank contamination. The "B" qualifier alerts the end-user to the presence of this analyte in the preparation/reagent blank.

3. The value reported is less than or equal to three (3) times the value in the trip/field blank. It is the policy of NJDEP-DPF SR to negate the reported value as due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
4. The value reported is greater than three (3) times but less than ten (10) times the value in the trip/field blanks and is considered "real". However, the reported value must be quantitatively qualified "J" due to trip/field blank contamination.
5. The concentration reported by the laboratory is incorrectly calculated.
6. The laboratory failed to report the presence of the analyte in the sample.
7. The reported Hexavalent Chromium value was qualified because the Calibration Check Standard was not within the recovery range (90-110 percent).
8. In the Duplicate Sample Analysis, Hexavalent Chromium fell outside the control limits of ≤ 20 percent for sample results $> 4xRL$ or $+ RL$ for sample results $< 4xRL$. Therefore, the result was qualified.
9. This analyte was rejected because the laboratory performed the Duplicate Analysis on a field blank.
10. The reported value was qualified because the PVS recovery was greater than 115 percent.
11. The reported value was qualified because the PVS recovery was less than 85 percent.
12. The non-detected value was qualified (UJ) because the PVS recovery was less than 85 percent. The possibility of a false negative exists.
13. The reported analyte was qualified because the associated Calibration Blank result was greater than the MDL.
14. The laboratory made a transcription error. No hits were found in the raw data.
15. This analyte is rejected because the laboratory exceeded the holding time for digestion and analysis.
16. The laboratory subtracted the preparation/reagent blank from the sample result. The Reviewer's calculation puts the preparation/reagent blank back into the result.
17. The photocopy is unreadable. Therefore, the QA reviewer cannot read the laboratory's reported concentration result.

18. The reported value was qualified because the predigestion spike recovery was less than 75 %, but greater than 50%.
19. The reported value was qualified because the predigestion spike recovery was greater than 125 percent.
20. The non-detected value was qualified (UJ) because the predigestion and or redigestion spike recovery was less than 75 percent. The possibility of a false negative exists.
21. The reported result was qualified or rejected because the laboratory did not record the pH value(s) of the sample in a laboratory notebook.
22. The reported value was qualified (J/UJ) because the sample moisture content exceeded 50 percent.
23. The sample result was rejected because the soluble and insoluble matrix spike recoveries were less than 50%.
24. The detected sample result was qualified (J) because the incorrect spike concentration was used.
25. The reported sample results were rejected because the predigestion spike recovery was greater than 150 percent.
26. The reported sample results were rejected because the redigestion spike recovery was greater than 150 percent.
27. The reported value was qualified (J) because the redigestion spike recovery was less than 75 percent.
28. The reported value was qualified (J/UJ) because the sample digestion temperature was less than 90C.
29. In the Field Duplicate Sample Analysis, Hexavalent Chromium fell outside the control limits of < 50% for sample results > 5xRL.
30. The reported value was qualified as estimated (J/UJ) but the bias is uncertain due to both high and low MS recoveries.
31. The reported result was greater than the MDL but less than the RL and qualified (J) as estimated by the laboratory.
32. The reported value was qualified because the sample replicate precision criterion of < 20% for method 7199 was exceeded.
33. The reported value was qualified (J/UJ) because the laboratory control sample (LCS) recovery was less than 80%.
34. The reported value was qualified (J) because the laboratory control sample (LCS) recovery was greater than 120%.

35. The reported result was qualified because the matrix spike analysis was not performed at the proper frequency.
36. The reported result was qualified because the laboratory duplicate analysis was not performed at the proper frequency.
37. The result was qualified because the cooler temperature upon sample receipt exceeded 6°C.

Soil and Concrete Target Analyte Summary Hit List (Metals)

Site Name PPG Garfield Avenue – Forrest Street Additional Remedial Investigation (GARIS)
Sampling Date June 4, 2015
Lab Name/ID Accutest, Dayton, NJ
SDG No JB96227
Sample Matrix Soil and Concrete
Trip Blank ID NA
Field Blank ID FB-20150602 (Soil) FB-C-20150604 (Concrete)

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
FS21-0.0-0.5	JB96227-3A	ANTIMONY	U	5.1	5.1	2.4	Qualify	15,19
FS21-0.0-0.5	JB96227-3A	CHROMIUM	U	9.1	9.1	1.2		
FS21-0.0-0.5	JB96227-3A	NICKEL	U	7.6	7.6	4.9		
FS21-0.0-0.5	JB96227-3A	THALLIUM	-0.03	U	U	1.2	Qualify	24
FS21-0.0-0.5	JB96227-3A	VANADIUM	U	14.7	14.7	6.1		
FS21-0.0-0.5X	JB96227-5A	ANTIMONY	U	U	U	2.3	Qualify	15,19
FS21-0.0-0.5X	JB96227-5A	CHROMIUM	U	11.0	11.0	1.1		
FS21-0.0-0.5X	JB96227-5A	NICKEL	U	12.5	12.5	4.6		
FS21-0.0-0.5X	JB96227-5A	THALLIUM	-0.03	U	U	1.1	Qualify	24
FS21-0.0-0.5X	JB96227-5A	VANADIUM	U	18.3	18.3	5.7		
FS21-10.0-10.5	JB96227-9A	VANADIUM	U	24.8	24.8	5.9		
FS21-10.0-10.5	JB96227-9A	CHROMIUM	U	16.6	16.6	1.2		
FS21-10.0-10.5	JB96227-9A	ANTIMONY	U	U	U	2.4	Qualify	15,19
FS21-10.0-10.5	JB96227-9A	THALLIUM	-0.03	U	U	1.2	Qualify	24
FS21-10.0-10.5	JB96227-9A	NICKEL	U	12.3	12.3	4.7		
FS21-12.0-12.5	JB96227-10A	VANADIUM	U	23.4	23.4	5.7		
FS21-12.0-12.5	JB96227-10A	CHROMIUM	U	15.4	15.4	1.1		
FS21-12.0-12.5	JB96227-10A	ANTIMONY	U	U	U	2.3	Qualify	15,19
FS21-12.0-12.5	JB96227-10A	THALLIUM	-0.03	U	U	1.1	Qualify	24
FS21-12.0-12.5	JB96227-10A	NICKEL	U	9.6	9.6	4.5		
FS21-14.0-14.5	JB96227-11A	VANADIUM	U	21.2	21.2	5.6		
FS21-14.0-14.5	JB96227-11A	CHROMIUM	U	22.8	22.8	1.1		
FS21-14.0-14.5	JB96227-11A	ANTIMONY	U	U	U	2.2	Qualify	15,19

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
FS21-14.0-14.5	JB96227-11A	THALLIUM	-0.03	0.29	0.29	1.1	Qualify	24,22
FS21-14.0-14.5	JB96227-11A	NICKEL	U	12.5	12.5	4.5		
FS21-16.0-16.5	JB96227-12A	VANADIUM	U	27.0	27.0	5.7		
FS21-16.0-16.5	JB96227-12A	CHROMIUM	U	28.8	28.8	1.1		
FS21-16.0-16.5	JB96227-12A	ANTIMONY	U	U	U	2.3	Qualify	15,19
FS21-16.0-16.5	JB96227-12A	THALLIUM	-0.03	U	U	1.1	Qualify	24
FS21-16.0-16.5	JB96227-12A	NICKEL	U	14.8	14.8	4.6		
FS21-18.0-18.5	JB96227-13A	VANADIUM	U	19.8	19.8	5.7		
FS21-18.0-18.5	JB96227-13A	CHROMIUM	U	19.9	19.9	1.1		
FS21-18.0-18.5	JB96227-13A	ANTIMONY	U	U	U	2.3	Qualify	15,19
FS21-18.0-18.5	JB96227-13A	THALLIUM	-0.03	U	U	1.1	Qualify	24
FS21-18.0-18.5	JB96227-13A	NICKEL	U	10.3	10.3	4.6		
FS21-2.0-2.5	JB96227-4A	VANADIUM	U	24.7	24.7	5.5		
FS21-2.0-2.5	JB96227-4A	CHROMIUM	U	16.9	16.9	1.1		
FS21-2.0-2.5	JB96227-4A	ANTIMONY	U	U	U	2.2	Qualify	15,19
FS21-2.0-2.5	JB96227-4A	THALLIUM	-0.03	0.28	0.28	1.1	Qualify	24
FS21-2.0-2.5	JB96227-4A	NICKEL	U	14.5	14.5	4.4		
FS21-20.0-20.5	JB96227-14A	VANADIUM	U	16.3	16.3	5.6		
FS21-20.0-20.5	JB96227-14A	CHROMIUM	U	19.1	19.1	1.1		
FS21-20.0-20.5	JB96227-14A	ANTIMONY	U	U	U	2.2	Qualify	15,19
FS21-20.0-20.5	JB96227-14A	THALLIUM	-0.03	U	U	1.1	Qualify	24
FS21-20.0-20.5	JB96227-14A	NICKEL	U	6.0	6.0	4.5		
FS21-22.0-22.5	JB96227-15A	VANADIUM	U	19.7	19.7	5.9		
FS21-22.0-22.5	JB96227-15A	CHROMIUM	U	13.3	13.3	1.2		
FS21-22.0-22.5	JB96227-15A	ANTIMONY	U	U	U	2.3	Qualify	15,19
FS21-22.0-22.5	JB96227-15A	THALLIUM	-0.03	U	U	1.2	Qualify	24
FS21-22.0-22.5	JB96227-15A	NICKEL	U	9.3	9.3	4.7		
FS21-24.0-24.5	JB96227-16A	VANADIUM	U	13.5	13.5	5.7		
FS21-24.0-24.5	JB96227-16A	CHROMIUM	U	7.8	7.8	1.1		
FS21-24.0-24.5	JB96227-16A	ANTIMONY	U	U	U	2.3	Qualify	15,19
FS21-24.0-24.5	JB96227-16A	THALLIUM	-0.03	U	U	1.1	Qualify	24
FS21-24.0-24.5	JB96227-16A	NICKEL	U	4.5	4.5	4.6	Qualify	22

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
FS21-26.0-26.5	JB96227-17A	VANADIUM	U	19.8	19.8	6.6		
FS21-26.0-26.5	JB96227-17A	CHROMIUM	U	14.1	14.1	1.3		
FS21-26.0-26.5	JB96227-17A	ANTIMONY	-0.06	U	U	2.7	Qualify	15,19,24
FS21-26.0-26.5	JB96227-17A	THALLIUM	-0.07	U	U	1.3	Qualify	24
FS21-26.0-26.5	JB96227-17A	NICKEL	U	12.8	12.8	5.3		
FS21-28.0-28.5	JB96227-18A	VANADIUM	U	9.1	9.1	6.3		
FS21-28.0-28.5	JB96227-18A	CHROMIUM	U	5.6	5.6	1.3		
FS21-28.0-28.5	JB96227-18A	ANTIMONY	-0.06	U	U	2.5	Qualify	15,19,24
FS21-28.0-28.5	JB96227-18A	THALLIUM	-0.07	U	U	1.3	Qualify	24
FS21-28.0-28.5	JB96227-18A	NICKEL	U	3.4	3.4	5.1	Qualify	22
FS21-30.0-30.5	JB96227-19A	VANADIUM	U	10.8	10.8	6.6		
FS21-30.0-30.5	JB96227-19A	CHROMIUM	U	8.0	8.0	1.3		
FS21-30.0-30.5	JB96227-19A	ANTIMONY	-0.06	U	U	2.6	Qualify	15,19,24
FS21-30.0-30.5	JB96227-19A	THALLIUM	-0.07	U	U	1.3	Qualify	24
FS21-30.0-30.5	JB96227-19A	NICKEL	U	7.2	7.2	5.2		
FS21-32.0-32.5	JB96227-20A	VANADIUM	U	13.5	13.5	6.4		
FS21-32.0-32.5	JB96227-20A	CHROMIUM	U	9.1	9.1	1.3		
FS21-32.0-32.5	JB96227-20A	ANTIMONY	-0.06	U	U	2.5	Qualify	15,19,24
FS21-32.0-32.5	JB96227-20A	THALLIUM	-0.07	U	U	1.3	Qualify	24
FS21-32.0-32.5	JB96227-20A	NICKEL	U	7.7	7.7	5.1		
FS21-34.0-34.5	JB96227-21A	NICKEL	U	14.7	14.7	5.0		
FS21-34.0-34.5	JB96227-21A	THALLIUM	-0.07	U	U	1.2	Qualify	24
FS21-34.0-34.5	JB96227-21A	ANTIMONY	-0.06	U	U	2.5	Qualify	15,19,24
FS21-34.0-34.5	JB96227-21A	CHROMIUM	U	15.2	15.2	1.2		
FS21-34.0-34.5	JB96227-21A	VANADIUM	U	19.1	19.1	6.2		
FS21-36.0-36.5	JB96227-22A	NICKEL	U	6.7	6.7	4.9		
FS21-36.0-36.5	JB96227-22A	THALLIUM	-0.07	U	U	1.2	Qualify	24
FS21-36.0-36.5	JB96227-22A	ANTIMONY	-0.06	U	U	2.4	Qualify	15,19,24
FS21-36.0-36.5	JB96227-22A	CHROMIUM	U	8.7	8.7	1.2		
FS21-36.0-36.5	JB96227-22A	VANADIUM	U	13.4	13.4	6.1		
FS21-38.0-38.5	JB96227-23A	NICKEL	U	5.5	5.5	4.6		
FS21-38.0-38.5	JB96227-23A	THALLIUM	-0.07	U	U	1.2	Qualify	24

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
FS21-38.0-38.5	JB96227-23A	ANTIMONY	-0.06	U	U	2.3	Qualify	15,19,24
FS21-38.0-38.5	JB96227-23A	CHROMIUM	U	7.7	7.7	1.2		
FS21-38.0-38.5	JB96227-23A	VANADIUM	U	11.7	11.7	5.8		
FS21-39.5-40.0	JB96227-24A	NICKEL	U	7.4	7.4	5.0		
FS21-39.5-40.0	JB96227-24A	THALLIUM	-0.07	U	U	1.3	Qualify	24
FS21-39.5-40.0	JB96227-24A	ANTIMONY	-0.06	U	U	2.5	Qualify	15,19,24
FS21-39.5-40.0	JB96227-24A	CHROMIUM	U	9.8	9.8	1.3		
FS21-39.5-40.0	JB96227-24A	VANADIUM	U	14.8	14.8	6.3		
FS21-4.0-4.5	JB96227-6A	NICKEL	U	16.0	16.0	5.1		
FS21-4.0-4.5	JB96227-6A	THALLIUM	-0.03	U	U	1.3	Qualify	24
FS21-4.0-4.5	JB96227-6A	ANTIMONY	U	U	U	2.5	Qualify	15,19
FS21-4.0-4.5	JB96227-6A	CHROMIUM	U	16.7	16.7	1.3		
FS21-4.0-4.5	JB96227-6A	VANADIUM	U	23.3	23.3	6.3		
FS21-6.0-6.5	JB96227-7A	NICKEL	U	14.6	14.6	5.4		
FS21-6.0-6.5	JB96227-7A	THALLIUM	-0.03	U	U	1.3	Qualify	24
FS21-6.0-6.5	JB96227-7A	ANTIMONY	U	U	U	2.7	Qualify	15,19
FS21-6.0-6.5	JB96227-7A	CHROMIUM	U	13.8	13.8	1.3		
FS21-6.0-6.5	JB96227-7A	VANADIUM	U	19.4	19.4	6.7		
FS21-8.0-8.5	JB96227-8A	NICKEL	U	14.6	14.6	5.6		
FS21-8.0-8.5	JB96227-8A	THALLIUM	-0.03	U	U	1.4	Qualify	24
FS21-8.0-8.5	JB96227-8A	ANTIMONY	U	U	U	2.8	Qualify	15,19
FS21-8.0-8.5	JB96227-8A	CHROMIUM	U	11.9	11.9	1.4		
FS21-8.0-8.5	JB96227-8A	VANADIUM	U	17.2	17.2	6.9		
FS21-CB	JB96227-28A	CHROMIUM	U	14.1	14.1	1.2		
FS21-CT	JB96227-27A	CHROMIUM	U	374	374	1.0		

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

NJDEP Soil Metals Laboratory Footnotes

1. The value reported is less than or equal to 3x the value in the method blank. It is the policy of NJDEP-DPF SR to negate the reported value due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
2. The value reported is greater than three (3) but less than ten (10) times the value in the method blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to the method blank contamination. The "B" qualifier alerts the end-user to the presence of this analyte in the method blank.
3. The value reported is less than or equal to 3x the value in the trip/field blank. It is the policy of NJDEP-DPF SR to negate the reported value as due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
4. The value reported is greater than 3x but less than ten (10) the value in the trip/field blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to trip/field blank contamination.
5. The concentration reported by the laboratory is incorrectly calculated.
6. The laboratory failed to report the presence of the analyte in the sample.
7. The reported metal value was qualified because the Calibration Verification Standard was not within the recovery range (90-110 percent).
8. In the MS/MSD Sample Analysis, this analyte fell outside the control limits of 20% RPD. Therefore, the result was qualified.
9. This analyte was qualified because the laboratory performed the MS/MSD Analysis on a field blank.
10. The reported analyte was qualified because the associated Calibration Blank result was greater than the MDL.
11. The reported value was qualified because serial dilution analysis was not within QC limit of 10% D.
12. This analyte is qualified or rejected because the laboratory exceeded the holding time for digestion and analysis.
13. The laboratory subtracted the method blank from the sample result. The reviewer's calculation has added the method blank result to the reported concentration.

14. The photocopy submitted is illegible. Therefore, the QA reviewer cannot read the laboratory's reported concentration result.
15. The reported or nondetected value was qualified because the MS/MSD spike recovery was less than 75 percent.
16. The reported value was qualified because the MS/MSD spike recovery was greater than 125 percent.
17. The reported value was qualified as estimated (J/UJ) but the bias is uncertain due to both high and low MS recoveries.
18. The reported values were qualified because the laboratory duplicate exceeded 35 percent RPD or the absolute difference exceeded the reporting limit for sample results < 5X the reporting limit.
19. The reported value was qualified because the field duplicate exceeded 50 percent RPD for results > 5X the reporting limit or the absolute difference exceeded the reporting limit for sample results < 5X the reporting limit.
20. The reported value was qualified because the LCS recovery was less than 80 percent.
21. The reported value was qualified because the sample moisture content was greater than 50 percent.
22. The reported result was greater than the MDL but less than the RL and qualified (J) as estimated by the laboratory.
23. The reported value was qualified because the LCS recovery was greater than 120 percent.
24. The reported value was qualified because of negative instrument drift.
25. The reported value was qualified as estimated (J/UJ) but the bias is uncertain due to either an acceptable MS recovery and high or low MSD recovery, or acceptable MSD recovery and a high or low MS recovery.
26. The reported calculated value was negated since one or both of the values in the calculation were negated.

Aqueous Target Analyte Summary Hit List (Metals)

Site Name PPG Garfield Avenue – Forrest Street Additional Remedial Investigation (GARIS)
Sampling Date June 4, 2015
Lab Name/ID Accutest, Dayton, NJ
SDG No JB96227
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID FB-20150602 (Soil) FB-C-20150604 (Concrete)

Field Sample ID	Lab Sample ID	Analyte	Method Blank (ug/l)	Laboratory Sample Result (ug/l)	Validation Sample Result (ug/l)	RL (ug/l)	Quality Assurance Decision	NJDEP Validation Footnote
FB-20150604	JB96227-1A	CHROMIUM	-0.4	U	U	10	Qualify	23
FB-20150604	JB96227-1A	THALLIUM	-0.2	U	U	2.0	Qualify	23
FB-20150604	JB96227-1A	NICKEL	-0.4	U	U	10	Qualify	23
FB-C-20150604	JB96227-2A	CHROMIUM	-0.4	U	U	10	Qualify	23
FS21-GWF-40.0-44.0	JB96227-25A	CHROMIUM	-0.4	U	U	10	Qualify	23
FS21-GWU-40.0-44.0	JB96227-26A	CHROMIUM	U	2370	2370	50	Qualify	15

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

Aqueous Metals NJDEP Laboratory Footnotes

1. The value reported is less than or equal to 3x the value in the method blank. It is the policy of NJDEP-DPF SR to negate the reported value due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
2. The value reported is greater than three (3) but less than ten (10) times the value in the method blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to the method blank contamination. The "B" qualifier alerts the end-user to the presence of this analyte in the method blank.
3. The value reported is less than or equal to 3x the value in the trip/field blank. It is the policy of NJDEP-DPF SR to negate the reported value as due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.

4. The value reported is greater than 3x but less than ten (10) the value in the trip/field blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to trip/field blank contamination.
5. The concentration reported by the laboratory is incorrectly calculated.
6. The laboratory failed to report the presence of the analyte in the sample.
7. The reported metal value was qualified because the Calibration Verification Standard was not within the recovery range (90-110 percent).
8. In the MS/MSD Sample Analysis, this analyte fell outside the control limits of 20% RPD. Therefore, the result was qualified.
9. This analyte was qualified because the laboratory performed the MS/MSD Analysis on a field blank.
10. The reported analyte was qualified because the associated Calibration Blank result was greater than the MDL.
11. The reported value was qualified because serial dilution analysis was not within QC limit of 10% D.
12. This analyte is rejected or qualified because the laboratory exceeded the holding time for digestion and analysis.
13. The laboratory subtracted the method blank from the sample result. The reviewer's calculation has added the method blank result to the reported concentration.
14. The photocopy submitted is illegible. Therefore, the QA reviewer cannot read the laboratory's reported concentration result.
15. The reported or nondetected value was qualified because the MS/MSD spike recovery was less than 75 percent for metals or less than 90% for wet chem.
16. The reported value was qualified because the MS/MSD spike recovery was greater than 125 percent for metals or greater than 110% for wet chem.
17. The reported value was qualified as estimated (J/UJ) but the bias is uncertain due to both high and low MS recoveries.
18. The reported values were qualified because the laboratory duplicate exceeded 20 percent RPD or the absolute difference exceeded the reporting limit for sample results < 5X the reporting limit.
19. The reported value was qualified because the field duplicate exceeded 30 percent RPD for results > 5X the reporting limit.

20. The reported value was qualified because the LCS recovery was less than 80 percent.
21. The reported result was greater than the MDL but less than the RL and qualified (J) as estimated by the laboratory.
22. The reported value was qualified because the LCS recovery was greater than 120 percent.
23. The reported value was qualified because of negative instrument drift.

Attachment B

Data Validation Report Form

Client Name: PPG Industries	Project Number: 60314351.GA.DE.PDI.P3
Site Location: PPG Garfield Avenue – Forrest Street Additional Remedial Investigation (GARIS)	Project Manager: Bill Spronz
Laboratory: Accutest, Dayton, NJ	Type of Validation: Full
Laboratory Job No: JB96227	Date Checked: 7/21/2015
Validator: Justin Webster	Peer: Lisa Krowitz

ITEM	YES	NO	N/A	COMMENTS
Sample results included?	X			
Reporting Limits met project requirements?	X			
Field I.D. included?	X			
Laboratory I.D. included?	X			
Sample matrix included?	X			
Sample receipt temperature 2-6°C?	X			
Signed COCs included?	X			
Date of sample collection included?	X			
Date of sample digestion included?	X			
Holding time to digestion met criteria? (Soils -30 days from collection to digestion.)	X			
Date of analysis included?	X			
Holding time to analysis met criteria? (Soils -168 hours from digestion to analysis; Aqueous - 24 hours from collection to analysis.)	X			
Method reference included?	X			
Laboratory Case Narrative included?	X			

Definitions: MDL Method Detection Limit; %R Percent Recovery; RL Reporting Limit; RPD Relative Percent Difference; RSD Relative Standard Deviation :Corr Correlation Coefficient.

ITEM	YES	NO	N/A	COMMENTS
Initial calibration documentation included in lab package?	X			
1) Blank plus 4 standards (7196A) or blank plus 3 standards (7199)	X			
2) Correlation coefficient of =0.995 (7196A) or =0.999 (7199)	X			
3) Calibrate daily or each time instrument is set up.	X			
Calibration Check Standard (CCS) for 7196A and Quality Control Sample (QCS) for 7199 Included in Lab Package?	X			
1) %R criteria met? (90 - 110%)	X			
2) Correct frequency of one per every 10 samples	X			
3) CCS and QCS from independent source and at mid-level of calibration curve	X			
Calibration Blanks	X			
1) Analyzed prior to initial calibration standards and after each CCS/QCS?	X			
2) Absolute value should not exceed MDL.	X			
Method Blank, Field Blanks and/or Equipment Blanks Included in Lab Package?	X			
1) Method blank analyzed with each preparation batch?	X			
2) Absolute value should not exceed MDL.	X			
Eh and pH Data	X			
1) Eh and pH data was included and plotted for all samples?	X			
Soluble Matrix Spike Data Included in Lab Package?	X			
1) Soluble Matrix %R criteria met? (75-125%R).	X			
2) Was the spike concentration 40 mg/Kg or twice the sample concentration?	X			
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	X			
Insoluble Matrix Spike Data Included in Lab Package?	X			
1) Insoluble Matrix %R criteria met? (75-125%R).	X			
2) Was the spike concentration around 400 to 800 mg/Kg?		X		Concrete insoluble MS concentration was 1145.55 mg/kg. No actions taken since MS recoveries were acceptable.
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	X			

ITEM	YES	NO	N/A	COMMENTS
Post Digestion Spike	X			
1) Post Digestion Spike %R criteria met? (85-115%R).	X			
2) Was the spike concentration 40 mg/Kg or twice the sample concentration?	X			
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	X			
Sample Duplicate Data Included in Lab Package?	X			
1) RPD criteria met? (RPD ≤ 20%) if both results are ≤4x RL or absolute difference ≤ RL if either or both results are <4xRL	X			
2) Was a sample duplicate analyzed at the frequency of 1 per batch or 20 samples?	X			
Was a Laboratory Control Sample (LCS) Included in Lab Package?	X			
1) %R criteria met? (80-120%R).	X			
2) Was an LCS analyzed at the frequency of 1/batch or 20 samples?	X			
Were any Field Duplicate samples submitted with this SDG?	X			JB96227-3/5
1) Were Field duplicate RPD criteria met? (RPD≤50% for both sample results >5xRL or professional judgement if either or both results are <5xRL.	X			
Were all sample quantitation and reporting requirements met?	X			
1) Were all solid samples reported with percent solids > 50%?	X			
2) Were any samples analyzed or reported with dilutions?	X			
Miscellaneous Items	X			
1) For soils by 7196A, was the pH within a range of 7.0-8.0?	X			
2) For soils by 7199, was the pH within a range of 9.0-9.5?			X	
3) For aqueous by 7196A, was the pH with a range of 1.5-2.5?	X			
4) For soils (3060A), was the digestion temperature 90-95C for at least 60 minutes?	X			
5) For 7199, was each sample injected twice and was the RPD =20?			X	

SDG#: JB96227/ Method 7196A

Batch: GN27193

Cr+6 ICAL 6/4/2015

Soil

(p. 106 of data pkg)

x - concentration	y - response
0	0
0.01	0.01
0.05	0.044
0.1	0.086
0.3	0.258
0.5	0.43
0.8	0.673
1	0.829

(p. 106 of data pkg)

AECOM Calculated Offset	0.0038	OK	Reported Offset	0.0038
AECOM Slope	0.8332	OK	Reported Slope	0.8332
AECOM Calculated r	0.99986	OK	Reported r	0.99986

LCS calculation

GP89814-B1

P.72,106

Background Absorbance	0
Total absorbance	0.805
Total absorbance - background	0.80500
Instrument Concentration	0.962
Sample weight (mg/kg)	0.0025
Final Volume (L)	0.1
Dilution Factor	1

AECOM Calculated LCS Result (mg/Kg)	38.5	OK	Reported Result (mg/Kg)	38.5
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%R = Found/True*100

GP89814-B1

P.72,106

True Value (mg/kg)	40
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AECOM Calculated %R	96.2	OK rounding	Reported %R	96
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MS calculation

GP89814-S1

P.74,106

Background reading	0
Total absorbance	0.739
Total absorbance - background	0.739
Instrument Concentration	0.882
Sample weight (mg/kg)	0.00253
Final Volume (L)	0.1
Percent solids	0.886
Dilution Factor	1

AECOM Calculated MS Result (mg/Kg)	39.4	OK	Reported Result (mg/Kg)	39.4
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%R = Found/True*100

GP89814-S1

P.74,106

True Value (mg/kg)	44.6
Native concentration (mg/Kg)	2.3

AECOM %R	83.1	OK rounding	Reported %R	83.2
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Percent Solids

P.76

FS21-14.0-14.5

Empty dish weight=	22.67
Wet weight=	30.03
Dry weight=	29.19

AECOM %solids =	88.6	OK	Reported %solids=	88.6
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Reporting Limit		P.24	FS21-14.0-14.5
Low Standard	0.01		
Initial weight (mg/kg)	0.00254		
Final volume (L)	0.1		
Percent solids	0.886		
Dilution Factor	1		
Reporting Limit	0.44	OK rounding	Reported RL (mg/Kg)= 0.45

Sample Calculations		P.24, 105	FS21-14.0-14.5
Background reading	0		
Total absorbance	0.047		
Total absorbance - background	0.047		
Instrument Response	0.052		
Sample weight (mg/kg)	0.00254		
Final Volume (L)	0.1		
Percent solids	0.886		
Dilution Factor	1		
AECOM Calculated Result (mg/Kg)	2.3	OK	Reported Result (mg/Kg) 2.3

SDG#: JB96227/ Method 7196A

Batch: GN27222

Cr+6 ICAL 6/4/2015

Concrete

(p. 114 of data pkg)

x - concentration	y - response
0	0
0.01	0.007
0.05	0.036
0.1	0.081
0.3	0.253
0.5	0.429
0.8	0.681
1	0.835

(p. 114 of data pkg)

AECOM Calculated Offset	-0.0013	OK	Reported Offset	-0.0013
AECOM Slope	0.8449	OK	Reported Slope	0.8449
AECOM Calculated r	0.99986	OK	Reported r	0.99986

LCS calculation

GP89813-B1

P.72,114

Background Absorbance	0
Total absorbance	0.803
Total absorbance - background	0.80300
Instrument Concentration	0.952
Sample weight (mg/kg)	0.0025
Final Volume (L)	0.1
Dilution Factor	1

AECOM Calculated LCS Result (mg/Kg)	38.1	OK	Reported Result (mg/Kg)	38.1
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%R = Found/True*100

GP89813-B1

P.72,114

True Value (mg/kg)	40
--------------------	----

AECOM Calculated %R	95.2	OK rounding	Reported %R	95.3
---------------------	------	-------------	-------------	------

MS calculation

GP89814-S1

P.74,114

Background reading	0
Total absorbance	0.284
Total absorbance - background	0.284
Instrument Concentration	0.338
Sample weight (mg/kg)	0.00243
Final Volume (L)	0.1
Percent solids	0.953
Dilution Factor	25

AECOM Calculated MS Result (mg/Kg)	364.5	OK	Reported Result (mg/Kg)	364.0
------------------------------------	-------	----	-------------------------	-------

%R = Found/True*100

GP89814-S1

P.74,114

True Value (mg/kg)	43.2
--------------------	------

Native concentration (mg/Kg)	323
------------------------------	-----

AECOM%R	96.0	OK rounding	Reported %R	95.0
---------	------	-------------	-------------	------

Percent Solids

P.78

FS21-CT

Empty dish weight=	24
--------------------	----

Wet weight=	29.91
-------------	-------

Dry weight=	29.63
-------------	-------

AECOM%solids =	95.3	OK	Reported %solids=	95.3
----------------	------	----	-------------------	------

Reporting Limit		P.24	FS21-CT
Low Standard	0.01		
Initial weight (mg/kg)	0.00243		
Final volume (L)	0.1		
Percent solids	0.953		
Dilution Factor	25		
Reporting Limit	10.80	OK rounding	Reported RL (mg/Kg)= 10.00

Sample Calculations		P.42, 114	FS21-CT
Background reading	0		
Total absorbance	0.263		
Total absorbance - background	0.263		
Instrument Response	0.313		
Sample weight (mg/kg)	0.00254		
Final Volume (L)	0.1		
Percent solids	0.953		
Dilution Factor	25		
AECOM Calculated Result (mg/Kg)	323.0	OK	Reported Result (mg/Kg) 323.0

SDG#: JB96227/ Method 7196A

Batch: GN26621

Cr+6 ICAL 6/4/2015

Aqueous

(p. 80 of data pkg)

x - concentration	y - response
0	0
0.01	0.01
0.05	0.043
0.1	0.088
0.3	0.258
0.5	0.422
0.8	0.676
1	0.839

(p. 80 of data pkg)

AECOM Calculated Offset	0.0024	OK	Reported Offset	0.0024
AECOM Slope	0.8394	OK	Reported Slope	0.8394
AECOM Calculated r	0.99997	OK	Reported r	0.99997

LCS calculation

GP26661-B1

P.72,80

Background Absorbance	0
Total absorbance	0.134
Total absorbance - background	0.134
Instrument Concentration	0.1568
Dilution Factor	1

AECOM Calculated LCS Result (mg/L)	0.16	OK	Reported Result (mg/L)	0.16
------------------------------------	------	----	------------------------	------

%R = Found/True*100

GP26661-B1

P.72,80

True Value (mg/L)	0.15
-------------------	------

AECOM Calculated %R	104.5	OK rounding	Reported %R	106.7
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MS calculation

GN26400-S3

P.74,80

Background reading	0
Total absorbance	0.136
Total absorbance - background	0.136
Instrument Concentration	0.1592
Dilution Factor	1

AECOM Calculated MS Result (mg/L)	0.16	OK	Reported Result (mg/L)	0.16
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%R = Found/True*100

GN26400-S3

P.74,80

True Value (mg/L)	0.15
-------------------	------

Native concentration (mg/L)	0
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AECOM %R	106.1	OK rounding	Reported %R	106.7
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Reporting Limit

P.38

FS21-GWF-40.0-44.0

Low Standard	0.01
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Dilution Factor	1
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Reporting Limit	0.01	OK	Reported RL (mg/L)=	0.01
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Sample Calculations

P.38,80

FS21-GWF-40.0-44.0

Background reading	0
--------------------	---

Total absorbance	0
------------------	---

Total absorbance - background	0
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Instrument Response	-0.003
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Dilution Factor	1
-----------------	---

AECOM Calculated Result (mg/L)	0.0	OK	Reported Result (mg/L)	0.0
--------------------------------	-----	----	------------------------	-----

Client Name: PPG Industries				Project Number: 60279173.GA.RI.RPT.FOR	
Site Location: PPG Garfield Avenue – Forrest Street Additional Remedial Investigation (GARIS)				Project Manager: Bill Spronz	
Laboratory: Accutest, Dayton, NJ				Type of Validation: Limited	
Laboratory Job No: JB96227A				Date Checked: 7/21/2015	
Validator: Justin Webster				Peer: Lisa Krowitz	
ITEM	YES	NO	N/A	COMMENTS	
Sample results included?	X				
Reporting Limits met project requirements?	X				
Field I.D. included?	X				
Laboratory I.D. included?	X				
Sample matrix included?	X				
Sample receipt temperature 2-6C?	X				
Signed COCs included?	X				
Date of sample collection included?	X				
Date of sample digestion included?	X				
Date of analysis included?	X				
Holding time met QC criteria? (Aqueous – 28 days HCl to pH < 2, Cool, ≤ 6 °C)	X				
Method reference included?	X				
Laboratory Case Narrative included?	X				
Definitions: MDL - Method Detection Limit; %R - Percent Recovery; RL - Reporting Limit; RPD - Relative Percent Difference; RSD - Relative Standard Deviation :Corr - Correlation Coefficient.					

ITEM	YES	NO	N/A	COMMENTS
Sample dilutions?		X		
Initial calibration documentation included in lab package?			X	N/A for Limited Validation
1) Calibrate daily or each time instrument is set up.			X	
2) ICP (6010) -Blank plus 1 standard? If no, reject (R) data.			X	
3) Hg (7470/7471) -Blank plus 5 standards? If no, reject (R) data.			X	
Initial Calibration Verification Standard (ICV) for ICP (6010) and Initial Calibration Check Standard (ICCS) for Hg (7470/7471) included in lab package?			X	N/A for Limited Validation
1) Analyzed immediately after initial calibration? If no, reject (R) data.			X	
2) %R criteria met? (90-110%). If no, J positive results for affected analyte(s) if %R between 80-89% and 111-120% and indicate bias; UJ non-detect results for affected analyte(s) if %R between 80-89%, and R all data for affected analyte(s) if %R <80% or >120%.			X	
3) Spot check ICV/ICCS results for several analytes.			X	
Continuing Calibration Verification Standard (CCV) for ICP (6010) and Calibration Check Standard (CCS) for Hg (7470/7471) included in Lab Package?			X	N/A for Limited Validation
1) Analyzed immediately after each ICV/ICC/CB and after every 10 samples? If no, reject (R) data.			X	
2) CCS and CCV from independent source and at mid-level of calibration curve. If no, reject (R) data.			X	
3) %R criteria met? (90-110%R). If no, J positive results for affected analyte(s) if %R between 80-89% and 111-120% and indicate bias; UJ non-detect results for affected analyte(s) if %R between 80-89% and R all data for affected analyte(s) if %R <80% or >120%.			X	
4) Spot check CCV/CCS results for several analytes.			X	
Low Calibration Standard (CRI) included in Lab Package?			X	N/A for Limited Validation
1) %R criteria met? - 50-150% for Co, Mn, Zn, by ICP-MS; Pb, Tl by 6010; 70-130% all others. If no, refer to ILM05.4 NJ SOP 5.A.2 for actions.			X	

ITEM	YES	NO	N/A	COMMENTS
Calibration Blanks			X	N/A for Limited Validation
1) Analyzed after daily calibration and after each ICV/ICC/CCV/CCS and after every 10 samples? If no, reject (R) data.			X	
2) Absolute value <3xIDL? If no, -if sample result <10x CB result, qualify affected analyte(s) in associated samples with CB; -if sample result >10xCB result, no qualification.			X	
Method Blank Included in Lab Package?	X			
1) Method blank analyzed with each preparation batch or every SDG, or 1/20 samples? If no, reject (R) data, except no aqueous MB required for FB/EB if only soil samples were analyzed.	X			
2) Method blank analyzed 1/20 samples? If - MB 1/25, J sample results from 21-25; -MB >1/25, R sample results after 25th sample.	X			
3) MB results nondetect? If no, -sample result <3xMB, negate UB; -sample result>3xMB but <10xMB, JB; -sample result >10xMB, no qualification.		X		See nonconformance table
4) Negative MB result reported? If yes, -Positive sample result<10xMB, qualify estimated, biased low (J); -Non-detect sample result, qualify UJ, may be false non-detect.	X			See nonconformance table
Field Blanks/Equipment Blanks Included in Lab Package?	X			
1) FB/EB result non-detect? If no, -sample result <3xFB/EB, negate U; -sample result>3xFB/EB but <10xMB, J; -sample result >10xFB/EB, no qualification.	X			
Interference Check Standards (ICSA and ICSB) included in Lab Package?	X			
1) Analyzed at beginning of analytical run? If no, reject (R) data.	X			
2) %R criteria met? (80-120%) If no, %R>120%, no qualification if sample result non-detect; %R between 121-150%, J positive results, biased high; %R between 50-79%, J/UJ results, biased low; %R<50% or >150%, reject (R) result	X			
3) Spot check accuracy of %Rs	X			

ITEM	YES	NO	N/A	COMMENTS
Matrix Spike/Matrix Spike Duplicate Data Included in Lab Package?	X			
1) MS/MSD %R (75-125%R) and RPD (+20% aq or 35% soils for SR>5xRL or absolute difference <RL for SR<5xRL) criteria met? - %R>125% J positive results for affected analyte(s) for all samples in the same batch, accept NDs; -%R<75% J/UJ for affected analyte(s) for all samples in the same batch; - RPD outside limits J positive results for affected analyte(s) for all samples in the same batch/SDG, accept NDs. If absolute difference >RL for SR<5xRL estimate positive results and nondetects for affected analyte(s) for all samples in the same batch. For Hg same as above except Abs Diff between MS and MSD must be ≤ 2xRL.		X		See nonconformance table
2) Was a sample spiked at the frequency of 1/batch or 20 samples?	X			
3) Was the MS performed on a site sample?	X			
4) Was the MS performed on a FB/EB or TB? If yes, J all sample data.		X		
Post Digestion Spike		X		
1) %R criteria met? (80-120%R) - %R>120% J positive results for affected analyte(s) for all samples in the same batch/SDG, accept NDs. - %R<80% J/UJ affected analyte(s) for all samples in the same batch.			X	
2) Was the spike performed on a FB/EB or TB? If yes, J all sample data.			X	
3) Was a sample spiked at the frequency of 1/batch or 20 samples?			X	
Laboratory Duplicate Data Included in Lab Package?	X			MS/MSD
Aqueous - If RPD is >35% for SR≤5xRL estimate (J) results.- If absolute difference is >RL for SR <RL estimate (J) positive and nondetects (UJ).- For Hg – Aq ≤ 20%,	X			
Soil -- If RPD is >50% for SR≤5xRL estimate (J) results.- If absolute difference is >RL for SR <RL estimate (J) positive and nondetects (UJ).- For Hg Soil/Sediment ≤ 35%,	X			

ITEM	YES	NO	N/A	COMMENTS
Was a Laboratory Control Sample (LCS) Included in Lab Package?	X			
1) LCS %R criteria met? (80-120%R or within vendor limits). If no, J/UJ all affected analytes(s) for all samples in the same batch/SDG.	X			
2) Was an LCS analyzed at the frequency of 1/batch or 20 samples? If no, J/UJ affected analyte(s) for all samples in the same batch/SDG.	X			
Serial Dilution	X			
1) %D (<10%R) criteria met? - If analyte concentration >10xRL and %D >10% J positive results for affected analyte(s) for all samples in the same batch, accept NDs.	X			
2) Was the frequency 1/batch or 20 samples?	X			
3) Was a site sample used?	X			
4) Was a FB/EB or TB used? If yes, J all sample data.		X		
5) Spot check accuracy of %Ds.	X			
Field Duplicate Data included in Lab Package?	X			
Aqueous - If RPD is >30% for $SR \leq 5 \times RL$ estimate (J) results.- If absolute difference is >RL for $SR < RL$ estimate (J) positive and nondetects (UJ).-			X	
Soil -- If RPD is >50% for $SR \leq 5 \times RL$ estimate (J) results.- If absolute difference is >RL for $SR < RL$ estimate (J) positive and nondetects (UJ).-		X		See nonconformance table
Percent Solids data included in Lab Package?	X			
1) %Solids criteria (Reg 2 criteria) met? ($\geq 50\%$)	X			

Nonconformance Tables**Blanks**

Batch MP87054

Analyte	Result	3x	10x	Actions	Associated Samples	
Soil Method Blank	mg/kg	mg/kg	mg/kg			
Antimony	0.47	1.41	4.7	None, all results >10x MB or ND	FS21-0.0-0.5	FS21-2.0-2.5
Chromium	0.091	0.273	0.91	None, all results >10x MB	FS21-0.0-0.5X	FS21-20.0-20.5
Nickel	0.081	0.243	0.81	None, all results >10x MB	FS21-10.0-10.5	FS21-22.0-22.5
Thallium	-0.03	-0.09	-0.3	Non detects (UJ), detects < 10x MB (J-)	FS21-12.0-12.5	FS21-24.0-24.5
Vanadium	-0.02	-0.06	-0.2	None, all results >10x MB	FS21-14.0-14.5	FS21-4.0-4.5
					FS21-16.0-16.5	FS21-6.0-6.5
					FS21-18.0-18.5	FS21-8.0-8.5

Batch MP87048

Analyte	Result	3x	10x	Actions	Associated Samples	
Aqueous Method Blank	ug/L	ug/L	ug/L			
Antimony	1.4	4.2	14	None, all results ND	FB-20150604	
Chromium	-0.4	-1.2	-4	Non detects (UJ)	FB-C-20150604	
Nickel	-0.4	-1.2	-4	Non detects (UJ)	FS21-GWF-40.0-44.0	
Thallium	-0.2	-0.6	-2	Non detects (UJ)		
Vanadium	0.3	0.9	3	None, all results ND		

Batch MP87069

Analyte	Result	3x	10x	Actions	Associated Samples	
Soil Method Blank	mg/kg	mg/kg	mg/kg			
Antimony	-0.06	-0.18	-0.6	Non detects (UJ)	JB96227-17A	JB96227-22A
Chromium	0.07	0.21	0.7	None, all results >10x MB	JB96227-18A	JB96227-23A
Nickel	0.07	0.21	0.7	None, all results >10x MB	JB96227-19A	JB96227-24A
Thallium	-0.07	-0.21	-0.7	Non detects (UJ)	JB96227-20A	
Vanadium	-0.01	-0.03	-0.1	None, all results >10x MB	JB96227-21A	

Matrix Spike/Matrix Spike Duplicate**Batch MP87049****Source: FS21-GWU-40.0-44.0**

Analyte	MS	MSD	RPD	Qualifications	Associated Samples
	ug/L	ug/L	%		
Chromium	68.3	74	6	Qualify J, Estimate biased low	FS21-GWU-40.0-44.0

Batch MP87054**Source: FS21-14.0-14.5**

Analyte	MS	MSD	RPD	Qualifications	Associated Samples
	mg/kg	mg/kg	%		
Antimony	56.7	56.6	0.8	Qualify J, Estimate biased low	FS21-0.0-0.5 FS21-2.0-2.5 FS21-0.0-0.5X FS21-20.0-20.5 FS21-10.0-10.5 FS21-22.0-22.5 FS21-12.0-12.5 FS21-24.0-24.5 FS21-14.0-14.5 FS21-4.0-4.5 FS21-16.0-16.5 FS21-6.0-6.5 FS21-18.0-18.5 FS21-8.0-8.5

Field Duplicate

Analyte	FS21-0.0-0.5 mg/kg	RL mg/kg	FS21-0.0-0.5X mg/kg	RL mg/kg	RPD (%)	Actions	Associated Samples
ANTIMONY	5.1	2.4	2.3 U	2.3	NC	Abs Diff > RL; (J/UJ)	All soils collected in this SDG
CHROMIUM	9.1	1.2	11.0	1.1	18.9%	None	
NICKEL	7.6	4.9	12.5	4.6	48.8%	None	
THALLIUM	1.2 U	1.2	1.1 U	1.1	NC	None, Abs Diff < RL	
VANADIUM	14.7	6.1	18.3	5.7	21.8%	None	

Data Validation Report

Project:	PPG Garfield Avenue – Forrest Street Additional Remedial Investigation (GARIS)	
Laboratory:	Accutest, Dayton, NJ	
Laboratory Job No.:	JB96351, JB96351A, and JB96351R	
Analysis/Method:	Hexavalent Chromium SW846 3060A/7196 Select Metals SW846 3050B/6010C	
Validation Level:	Full (Hexavalent Chromium) Limited (Antimony, Chromium, Nickel, Thallium, Vanadium)	
Site Location/Address:	90 & 98 Forrest Street Jersey City, NJ	
AECOM Project No:	60279173.GA.RI.RPT.FOR	
Prepared by:	Justin Webster /AECOM	Completed on: 7/23/2015
Reviewed by:	Lisa Krowitz/AECOM	File Name: JB96351_A_R_2015_7_23_DV Report-F

Introduction

The data were reviewed in accordance with the FSP-QAPP and the following NJDEP guidance documents and validation Standard Operating Procedures (SOP):

- NJDEP Office of Data Quality SOP 5.A.10, Rev 3 (September 2009), SOP for Analytical Data Validation of Hexavalent Chromium - for USEPA SW-846 Method 3060A, and USEPA SW-846 Method 7196A;
- NJDEP Office of Data Quality SOP 5.A.16, Rev 1 (May 2002), Quality Assurance Data Validation of Analytical Deliverables for Inorganics (based on USEPA SW-846 Methods)
- Data Quality Assessment and Data Usability Evaluation Technical Guidance, version 1.0, April 2014;
- Data of Known Quality Protocols Technical Guidance, version 1.0, April 2014;

The results of quality control data analyzed with site samples were used to assess the overall reliability of the data. The following qualifiers were used to identify data quality issues

- U: Indicates the analyte was not detected in the sample above the sample reporting limit.
- J: Indicates the result was an estimated value; the associated numerical value was an approximate concentration of the analyte in the sample.

- UJ: Indicates the analyte was not detected above the reporting limit and the reporting limit was approximate.
- UB: The analyte concentration is less than or equal to three (3) times the concentration in the associated method/prep blank. The presence of the analyte in the sample is negated (UB) due to laboratory contamination.
- JB: The analyte concentration is greater than three (3) times, but less than or equal to ten (10) times the concentration in the associated method/prep blank. The presence of that analyte in the sample is considered "real". The concentration is quantitatively qualified (JB) due to method blank contamination.
- R: The sample result was rejected due to serious deficiencies; the presence or absence of the analyte could not be confirmed.
- RA: The sample result was rejected but is still considered usable.

Sample Information

The samples listed below were collected by AECOM on June 5, 2015 as part of the PPG Garfield Avenue – Forrest Street Additional Remedial Investigation (GARIS) sampling at 90 & 98 Forrest Street Jersey City, NJ. Only the samples and parameters listed below were validated.

Field ID	Laboratory ID	Matrix	Fraction
FS24-0.0-0.5	JB96351-1,1A,1R	Soil	Hexavalent Chromium, Select Metals
FS24-2.0-2.5	JB96351-2,2A,2R	Soil	Hexavalent Chromium, Select Metals
FB-20150605 (Equipment blank)	JB96351-5,5A	Aqueous	Hexavalent Chromium, Select Metals
FSI10-0.0-0.5	JB96351-6,6A,6R	Soil	Hexavalent Chromium, Select Metals
FSI10-1.0-1.5	JB96351-7,7A,7R	Soil	Hexavalent Chromium, Select Metals
FSI10-1.0-1.5X (Field duplicate of FSI10-1.0-1.5)	JB96351-8,8A,8R	Soil	Hexavalent Chromium, Select Metals
FSI10-3.0-3.5	JB96351-9,9A,9R	Soil	Hexavalent Chromium, Select Metals
FSI10-5.0-5.5	JB96351-10,10A,10R	Soil	Hexavalent Chromium, Select Metals
FSI10-10.0-10.5	JB96351-11,11A,11R	Soil	Hexavalent Chromium, Select Metals
FSI10-11.0-11.5	JB96351-12,12A,12R	Soil	Hexavalent Chromium, Select Metals
FSI10-13.0-13.5	JB96351-13,13A,13R	Soil	Hexavalent Chromium, Select Metals
FSI10-15.0-15.5	JB96351-14,14A,14R	Soil	Hexavalent Chromium, Select Metals
FSI10-17.0-17.5	JB96351-15,15A,15R	Soil	Hexavalent Chromium, Select Metals

The samples were collected following the procedures detailed in the Forrest Street Additional Remedial Investigation Work Plan dated April 27, 2015

General Comments

The data package was complete. Quality control (QC) issues identified during validation are discussed below. Refer to the Target Analyte Summary Hit(s) in Attachment A for a listing of all detected results, qualified results, and associated qualifications, where applicable. The nonconformances for each section discussed below are presented in Attachment B.

Hexavalent Chromium

MS Results

Soil

Sample FSI10-17.0-17.5 (JB96351-15) was selected for the soil matrix spike (MS) analysis and was used for supporting data quality recommendations. The soluble and insoluble MS recoveries (%Rs) from the initial batch were 61.2% and 99.4%, respectively. The soluble MS did not meet quality control (QC) criteria of 75-125%R. The post digestion spike (PDS) recovery was 102%, which met the PDS criteria of 85-115%.

Due to low soluble MS %R, the MS and soil samples were reanalyzed using Method 7196A. The soluble and insoluble MS results from the reanalysis batch were 71.4% and 95.9%, respectively. Again the soluble MS did not meet QC criteria of 75-125%R. The PDS %R was 97.3%, which met the PDS criteria of 85-115%.

Since the soluble MSs failed to meet QC criteria, additional parameters were analyzed to determine if possible matrix interferences could be the cause for the poor MS %Rs. All the soil samples were tested for pH and oxidation reduction potential (ORP), and plotted on an Eh/pH phase diagram. From this chart, the source sample for the MS analysis of sample FSI10-17.0-17.5 (JB96351-15) was plotted slightly below the phase change line, indicating reducing potential within the sample matrix, incapable of supporting hexavalent chromium. Analyses for ferrous iron, sulfide screen, and total organic carbon (TOC) were performed on the MS source sample to confirm the reducing potential within the sample matrix. The sulfide screen was reported as nondetect, indicating no reducing agents within the sample matrix; however, the ferrous iron (1.2%) and the TOC results (695 mg/Kg) were positive, indicating potential reducing agents within the sample matrix.

The soluble MS %Rs from the initial and reanalysis did not meet the MS QC requirements, but all MS %Rs were greater than 50%; therefore, the highest detected hexavalent chromium result or the nondetect hexavalent chromium result with the lowest reporting limit (RL) was reported for each soil sample. The reported hexavalent chromium results in all the soil samples were qualified as estimated (J/UJ) due to the poor soluble MS %Rs.

Field Duplicate Results

Samples FSI10-1.0-1.5 and FSI10-1.0-1.5X were collected as the field duplicate (FD) pair in this SDG. Hexavalent chromium met the precision criteria of < 50 percent relative percent difference (RPD) or absolute difference less than the RL for sample results $\leq 5 \times \text{RL}$.

Sample Results

The concentration of total chromium was compared to the concentration of hexavalent chromium to ensure that the total chromium concentration was greater than the hexavalent chromium concentration. No data were qualified on this basis.

Hexavalent chromium results (flagged B by the laboratory) that were less than the RL, but greater than or equal to the method detection limit (MDL) are approximate values and have been qualified as estimated (J).

TAL Metals

Method Blank

Negative instrument drift was detected for antimony, thallium, and vanadium in the MB associated with the aqueous field blank sample collected in this SDG. The potential for falsely nondetect and bias low sample results exist for the antimony, thallium, and vanadium results in sample FB-20150605. Refer to Attachment B, Blanks nonconformance, and the Hits List for a listing of all negative blank results and the qualified aqueous data.

Negative instrument drift was detected for thallium in the MB associated with the soils samples collected in SDG. The potential for falsely nondetect and bias low sample results exist for thallium in all the soil samples. Refer to Attachment B, Blanks nonconformance, and the Hits List for a listing of all negative blank results and the qualified soil data.

Equipment Blank

Nickel was detected in the equipment blank (EB) sample FB-20150605 at concentration above the MDL, but below the RL. Since the associated soil sample nickel results were reported with concentrations greater than 10 times the equipment blank contamination, soil nickel data was not impacted.

Matrix Spike/Matrix Spike Duplicate (MS/MSD)

Site sample FSI10-17.0-17.5 (JB96351-15A) was used for the MS/MSD analysis in association with the soil samples collected in this SDG. The MS and MSD for antimony were recovered at levels less than 75% indicating possible matrix interferences and the potential for biased low sample results. All antimony soil sample results within this SDG were qualified (J/UJ) as estimated with the potential for low bias.

Field Duplicate Results

Samples FSI10-1.0-1.5 and FSI10-1.0-1.5X were collected as the field duplicate pair in this SDG. All precision QC requirements were met. No data qualifications were necessary on this behalf.

Sample Results

Metals results (flagged B by the laboratory) that were less than the RL, but greater than or equal to the MDL are approximate values and have been qualified as estimated (J).

Data Quality and Usability

In general, these data appear to be valid and may be used for decision-making purposes. No data were rejected. Qualified results are presented in Attachments A and B.

The hexavalent chromium soil results in this SDG are usable as estimated values with the potential for low bias due to low MS recoveries. A reducing potential was indicated by the ancillary parameters (Eh/pH phase diagram, ferrous iron, and total organic carbon) suggesting that the matrix for this sample was not capable of supporting hexavalent chromium. The highest detected hexavalent chromium result or the nondetect hexavalent chromium result with the lowest RL between the initial analysis and reanalysis was reported for the soil samples in this SDG.

Antimony soil sample results qualified due to low MS/MSD recovery are usable as estimated values with low bias.

Sample results qualified due to negative instrument drift are usable as estimated or estimated nondetect with low bias or falsely nondetect.

Sample results reported between the MDL and RL are usable as estimated values with an unknown directional bias.

ATTACHMENTS

Attachment A: Target Analyte Summary Hitlist(s)

Attachment B: Data Validation Report Form

Attachment A

Target Analyte Summary Hitlist(s)

Soil Target Analyte Summary Hit List Hexavalent Chromium

Site Name PPG Garfield Avenue – Forrest Street Additional Remedial Investigation (GARIS)
Sampling Date June 5, 2015
Lab Name/ID Accutest, Dayton, NJ
SDG No JB96351 and JB96351R
Sample Matrix Soil
Trip Blank ID NA
Field Blank ID FB-20150605

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
FS24-0.0-0.5	JB96351-1	CHROMIUM (HEXAVALENT)	U	0.71	0.71	0.42	Qualify	18
FS24-2.0-2.5	JB96351-2R	CHROMIUM (HEXAVALENT)	U	1.8	1.8	0.51	Qualify	18
FSI10-0.0-0.5	JB96351-6	CHROMIUM (HEXAVALENT)	U	0.72	0.72	0.44	Qualify	18
FSI10-1.0-1.5	JB96351-7	CHROMIUM (HEXAVALENT)	U	2.8	2.8	0.42	Qualify	18
FSI10-1.0-1.5X	JB96351-8R	CHROMIUM (HEXAVALENT)	U	1.9	1.9	0.42	Qualify	18
FSI10-10.0-10.5	JB96351-11	CHROMIUM (HEXAVALENT)	U	2.3	2.3	0.49	Qualify	18
FSI10-11.0-11.5	JB96351-12	CHROMIUM (HEXAVALENT)	U	1.3	1.3	0.48	Qualify	18
FSI10-13.0-13.5	JB96351-13	CHROMIUM (HEXAVALENT)	U	1.6	1.6	0.57	Qualify	18
FSI10-15.0-15.5	JB96351-14R	CHROMIUM (HEXAVALENT)	U	1.1	1.1	0.58	Qualify	18
FSI10-17.0-17.5	JB96351-15	CHROMIUM (HEXAVALENT)	U	0.31	0.31	0.50	Qualify	18,31
FSI10-3.0-3.5	JB96351-9	CHROMIUM (HEXAVALENT)	U	1.1	1.1	0.46	Qualify	18
FSI10-5.0-5.5	JB96351-10	CHROMIUM (HEXAVALENT)	U	1.0	1.0	0.49	Qualify	18

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

NJDEP Soil Hexavalent Chromium Laboratory Footnote

1. The value reported is less than or equal to 3x the value in the preparation/reagent blank. It is the policy of NJDEP-DPFSR to negate the reported value due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.

2. The value reported is greater than three (3) times but less than ten (10) times the value in the preparation/reagent blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to the preparation/reagent blank contamination. The "B" qualifier alerts the end-user to the presence of this analyte in the preparation/reagent blank.
3. The value reported is less than or equal to three (3) times the value in the trip/field blank. It is the policy of NJDEP-DPF SR to negate the reported value as due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
4. The value reported is greater than three (3) times but less than ten (10) times the value in the trip/field blanks and is considered "real". However, the reported value must be quantitatively qualified "J" due to trip/field blank contamination.
5. The concentration reported by the laboratory is incorrectly calculated.
6. The laboratory failed to report the presence of the analyte in the sample.
7. The reported Hexavalent Chromium value was qualified because the Calibration Check Standard was not within the recovery range (90-110 percent).
8. In the Duplicate Sample Analysis, Hexavalent Chromium fell outside the control limits of ≤ 20 percent for sample results $> 4xRL$ or $+ RL$ for sample results $< 4xRL$. Therefore, the result was qualified.
9. This analyte was rejected because the laboratory performed the Duplicate Analysis on a field blank.
10. The reported value was qualified because the PVS recovery was greater than 115 percent.
11. The reported value was qualified because the PVS recovery was less than 85 percent.
12. The non-detected value was qualified (UJ) because the PVS recovery was less than 85 percent. The possibility of a false negative exists.
13. The reported analyte was qualified because the associated Calibration Blank result was greater than the MDL.
14. The laboratory made a transcription error. No hits were found in the raw data.
15. This analyte is rejected because the laboratory exceeded the holding time for digestion and analysis.

16. The laboratory subtracted the preparation/reagent blank from the sample result. The Reviewer's calculation puts the preparation/reagent blank back into the result.
17. The photocopy is unreadable. Therefore, the QA reviewer cannot read the laboratory's reported concentration result.
18. The reported value was qualified because the predigestion spike recovery was less than 75 %, but greater than 50%.
19. The reported value was qualified because the predigestion spike recovery was greater than 125 percent.
20. The non-detected value was qualified (UJ) because the predigestion and or redigestion spike recovery was less than 75 percent. The possibility of a false negative exists.
21. The reported result was qualified or rejected because the laboratory did not record the pH value(s) of the sample in a laboratory notebook.
22. The reported value was qualified (J/UJ) because the sample moisture content exceeded 50 percent.
23. The sample result was rejected because the soluble and insoluble matrix spike recoveries were less than 50%.
24. The detected sample result was qualified (J) because the incorrect spike concentration was used.
25. The reported sample results were rejected because the predigestion spike recovery was greater than 150 percent.
26. The reported sample results were rejected because the redigestion spike recovery was greater than 150 percent.
27. The reported value was qualified (J) because the redigestion spike recovery was less than 75 percent.
28. The reported value was qualified (J/UJ) because the sample digestion temperature was less than 90C.
29. In the Field Duplicate Sample Analysis, Hexavalent Chromium fell outside the control limits of < 50% for sample results > 5xRL.
30. The reported value was qualified as estimated (J/UJ) but the bias is uncertain due to both high and low MS recoveries.
31. The reported result was greater than the MDL but less than the RL and qualified (J) as estimated by the laboratory.

32. The reported value was qualified because the sample replicate precision criterion of < 20% for method 7199 was exceeded.
33. The reported value was qualified (J/UJ) because the laboratory control sample (LCS) recovery was less than 80%.
34. The reported value was qualified (J) because the laboratory control sample (LCS) recovery was greater than 120%.
35. The reported result was qualified because the matrix spike analysis was not performed at the proper frequency.
36. The reported result was qualified because the laboratory duplicate analysis was not performed at the proper frequency.
37. The result was qualified because the cooler temperature upon sample receipt exceeded 6°C.

Soil Target Analyte Summary Hit List (Metals)

Site Name PPG Garfield Avenue – Forrest Street Additional Remedial Investigation (GARIS)
Sampling Date June 5, 2015
Lab Name/ID Accutest, Dayton, NJ
SDG No JB96351A
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID FB-20150605

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
FS24-0.0-0.5	JB96351-1A	VANADIUM	U	30.4	30.4	5.0		
FS24-0.0-0.5	JB96351-1A	CHROMIUM	U	14.0	14.0	1.0		
FS24-0.0-0.5	JB96351-1A	ANTIMONY	U	U	U	2.0	Qualify	15
FS24-0.0-0.5	JB96351-1A	THALLIUM	-0.081	U	U	1.0	Qualify	24
FS24-2.0-2.5	JB96351-2A	VANADIUM	U	67.3	67.3	6.6		
FS24-2.0-2.5	JB96351-2A	CHROMIUM	U	168	168	1.3		
FS24-2.0-2.5	JB96351-2A	ANTIMONY	U	1.5	1.5	2.6	Qualify	15,21
FS24-2.0-2.5	JB96351-2A	THALLIUM	-0.081	U	UJ	1.3	Qualify	24
FS24-2.0-2.5	JB96351-2A	NICKEL	U	42.2	42.2	5.3		
FSI10-0.0-0.5	JB96351-6A	VANADIUM	U	14.7	14.7	5.7		
FSI10-0.0-0.5	JB96351-6A	CHROMIUM	U	8.6	8.6	1.1		
FSI10-0.0-0.5	JB96351-6A	ANTIMONY	U	U	U	2.3	Qualify	15
FSI10-0.0-0.5	JB96351-6A	THALLIUM	-0.081	U	U	1.1	Qualify	24
FSI10-1.0-1.5	JB96351-7A	ANTIMONY	U	U	U	2.2	Qualify	15
FSI10-1.0-1.5	JB96351-7A	CHROMIUM	U	28.6	28.6	1.1		
FSI10-1.0-1.5	JB96351-7A	THALLIUM	-0.081	0.21	0.21	1.1	Qualify	22,24
FSI10-1.0-1.5	JB96351-7A	VANADIUM	U	34.1	34.1	5.5		
FSI10-1.0-1.5X	JB96351-8A	ANTIMONY	U	0.48	0.48	2.0	Qualify	15,21
FSI10-1.0-1.5X	JB96351-8A	CHROMIUM	U	32.0	32.0	1.0		
FSI10-1.0-1.5X	JB96351-8A	THALLIUM	-0.081	U	U	1.0	Qualify	24
FSI10-1.0-1.5X	JB96351-8A	VANADIUM	U	34.2	34.2	5.0		
FSI10-10.0-10.5	JB96351-11A	VANADIUM	U	14.0	14.0	5.9		
FSI10-10.0-10.5	JB96351-11A	CHROMIUM	U	29.4	29.4	1.2		

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
FSI10-10.0-10.5	JB96351-11A	ANTIMONY	U	0.54	0.54	2.4	Qualify	15,21
FSI10-10.0-10.5	JB96351-11A	THALLIUM	-0.081	U	U	1.2	Qualify	24
FSI10-11.0-11.5	JB96351-12A	VANADIUM	U	21.7	21.7	6.3		
FSI10-11.0-11.5	JB96351-12A	CHROMIUM	U	15.1	15.1	1.3		
FSI10-11.0-11.5	JB96351-12A	ANTIMONY	U	U	U	2.5	Qualify	15
FSI10-11.0-11.5	JB96351-12A	THALLIUM	-0.081	U	U	1.3	Qualify	24
FSI10-13.0-13.5	JB96351-13A	VANADIUM	U	21.1	21.1	7.2		
FSI10-13.0-13.5	JB96351-13A	CHROMIUM	U	15.8	15.8	1.4		
FSI10-13.0-13.5	JB96351-13A	ANTIMONY	U	U	U	2.9	Qualify	15
FSI10-13.0-13.5	JB96351-13A	THALLIUM	-0.081	U	U	1.4	Qualify	24
FSI10-15.0-15.5	JB96351-14A	VANADIUM	U	25.1	25.1	7.3		
FSI10-15.0-15.5	JB96351-14A	CHROMIUM	U	18.9	18.9	1.5		
FSI10-15.0-15.5	JB96351-14A	ANTIMONY	U	U	U	2.9	Qualify	15
FSI10-15.0-15.5	JB96351-14A	THALLIUM	-0.081	U	U	1.5	Qualify	24
FSI10-17.0-17.5	JB96351-15A	VANADIUM	U	19.8	19.8	6.2		
FSI10-17.0-17.5	JB96351-15A	CHROMIUM	U	14.6	14.6	1.2		
FSI10-17.0-17.5	JB96351-15A	ANTIMONY	U	U	U	2.5	Qualify	15
FSI10-17.0-17.5	JB96351-15A	THALLIUM	-0.081	U	U	1.2	Qualify	24
FSI10-3.0-3.5	JB96351-9A	VANADIUM	U	20.4	20.4	5.7		
FSI10-3.0-3.5	JB96351-9A	CHROMIUM	U	22.0	22.0	1.1		
FSI10-3.0-3.5	JB96351-9A	ANTIMONY	U	U	U	2.3	Qualify	15
FSI10-3.0-3.5	JB96351-9A	THALLIUM	-0.081	U	U	1.1	Qualify	24
FSI10-5.0-5.5	JB96351-10A	VANADIUM	U	27.6	27.6	6.1		
FSI10-5.0-5.5	JB96351-10A	CHROMIUM	U	33.2	33.2	1.2		
FSI10-5.0-5.5	JB96351-10A	ANTIMONY	U	U	U	2.4	Qualify	15
FSI10-5.0-5.5	JB96351-10A	NICKEL	U	22.4	22.4	4.9		
FSI10-5.0-5.5	JB96351-10A	THALLIUM	-0.081	0.77	0.77	1.2	Qualify	22,24

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

NJDEP Soil Metals Laboratory Footnotes

1. The value reported is less than or equal to 3x the value in the method blank. It is the policy of NJDEP-DPF SR to negate the reported value due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
2. The value reported is greater than three (3) but less than ten (10) times the value in the method blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to the method blank contamination. The "B" qualifier alerts the end-user to the presence of this analyte in the method blank.
3. The value reported is less than or equal to 3x the value in the trip/field blank. It is the policy of NJDEP-DPF SR to negate the reported value as due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
4. The value reported is greater than 3x but less than ten (10) the value in the trip/field blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to trip/field blank contamination.
5. The concentration reported by the laboratory is incorrectly calculated.
6. The laboratory failed to report the presence of the analyte in the sample.
7. The reported metal value was qualified because the Calibration Verification Standard was not within the recovery range (90-110 percent).
8. In the MS/MSD Sample Analysis, this analyte fell outside the control limits of 20% RPD. Therefore, the result was qualified.
9. This analyte was qualified because the laboratory performed the MS/MSD Analysis on a field blank.
10. The reported analyte was qualified because the associated Calibration Blank result was greater than the MDL.
11. The reported value was qualified because serial dilution analysis was not within QC limit of 10% D.
12. This analyte is qualified or rejected because the laboratory exceeded the holding time for digestion and analysis.
13. The laboratory subtracted the method blank from the sample result. The reviewer's calculation has added the method blank result to the reported concentration.

14. The photocopy submitted is illegible. Therefore, the QA reviewer cannot read the laboratory's reported concentration result.
15. The reported or nondetected value was qualified because the MS/MSD spike recovery was less than 75 percent.
16. The reported value was qualified because the MS/MSD spike recovery was greater than 125 percent.
17. The reported value was qualified as estimated (J/UJ) but the bias is uncertain due to both high and low MS recoveries.
18. The reported values were qualified because the laboratory duplicate exceeded 35 percent RPD or the absolute difference exceeded the reporting limit for sample results < 5X the reporting limit.
19. The reported value was qualified because the field duplicate exceeded 50 percent RPD for results > 5X the reporting limit or the absolute difference exceeded the reporting limit for sample results < 5X the reporting limit.
20. The reported value was qualified because the LCS recovery was less than 80 percent.
21. The reported value was qualified because the sample moisture content was greater than 50 percent.
22. The reported result was greater than the MDL but less than the RL and qualified (J) as estimated by the laboratory.
23. The reported value was qualified because the LCS recovery was greater than 120 percent.
24. The reported value was qualified because of negative instrument drift.
25. The reported value was qualified as estimated (J/UJ) but the bias is uncertain due to either an acceptable MS recovery and high or low MSD recovery, or acceptable MSD recovery and a high or low MS recovery.
26. The reported calculated value was negated since one or both of the values in the calculation were negated.

Aqueous Target Analyte Summary Hit List (Metals)

Site Name PPG Garfield Avenue – Forrest Street Additional Remedial Investigation (GARIS)
Sampling Date June 5, 2015
Lab Name/ID Accutest, Dayton, NJ
SDG No JB96351A
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID FB-20150605

Field Sample ID	Lab Sample ID	Analyte	Method Blank (ug/l)	Laboratory Sample Result (ug/l)	Validation Sample Result (ug/l)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
FB-20150605	JB96351-5A	VANADIUM	-0.2	U	U	50	Qualify	23
FB-20150605	JB96351-5A	ANTIMONY	-0.3	U	U	6.0	Qualify	23
FB-20150605	JB96351-5A	NICKEL	U	2.0	2.0	10	Qualify	21
FB-20150605	JB96351-5A	THALLIUM	-1.5	U	U	2.0	Qualify	23

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

Aqueous Metals NJDEP Laboratory Footnotes

1. The value reported is less than or equal to 3x the value in the method blank. It is the policy of NJDEP-DPFSR to negate the reported value due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
2. The value reported is greater than three (3) but less than ten (10) times the value in the method blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to the method blank contamination. The "B" qualifier alerts the end-user to the presence of this analyte in the method blank.
3. The value reported is less than or equal to 3x the value in the trip/field blank. It is the policy of NJDEP-DPFSR to negate the reported value as due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
4. The value reported is greater than 3x but less than ten (10) the value in the trip/field blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to trip/field blank contamination.

5. The concentration reported by the laboratory is incorrectly calculated.
6. The laboratory failed to report the presence of the analyte in the sample.
7. The reported metal value was qualified because the Calibration Verification Standard was not within the recovery range (90-110 percent).
8. In the MS/MSD Sample Analysis, this analyte fell outside the control limits of 20% RPD. Therefore, the result was qualified.
9. This analyte was qualified because the laboratory performed the MS/MSD Analysis on a field blank.
10. The reported analyte was qualified because the associated Calibration Blank result was greater than the MDL.
11. The reported value was qualified because serial dilution analysis was not within QC limit of 10% D.
12. This analyte is rejected or qualified because the laboratory exceeded the holding time for digestion and analysis.
13. The laboratory subtracted the method blank from the sample result. The reviewer's calculation has added the method blank result to the reported concentration.
14. The photocopy submitted is illegible. Therefore, the QA reviewer cannot read the laboratory's reported concentration result.
15. The reported or nondetected value was qualified because the MS/MSD spike recovery was less than 75 percent for metals or less than 90% for wet chem.
16. The reported value was qualified because the MS/MSD spike recovery was greater than 125 percent for metals or greater than 110% for wet chem.
17. The reported value was qualified as estimated (J/UJ) but the bias is uncertain due to both high and low MS recoveries.
18. The reported values were qualified because the laboratory duplicate exceeded 20 percent RPD or the absolute difference exceeded the reporting limit for sample results < 5X the reporting limit.
19. The reported value was qualified because the field duplicate exceeded 30 percent RPD for results > 5X the reporting limit.
20. The reported value was qualified because the LCS recovery was less than 80 percent.

21. The reported result was greater than the MDL but less than the RL and qualified (J) as estimated by the laboratory.
22. The reported value was qualified because the LCS recovery was greater than 120 percent.
23. The reported value was qualified because of negative instrument drift.

Attachment B

Data Validation Report Form

Client Name: PPG Industries	Project Number: 60314351.GA.DE.PDI.P3
Site Location: PPG Garfield Avenue – Forrest Street Additional Remedial Investigation (GARIS)	Project Manager: Bill Spronz
Laboratory: Accutest, Dayton, NJ	Type of Validation: Full
Laboratory Job No: JB96351_R	Date Checked: 7/21/2015
Validator: Justin Webster	Peer: Lisa Krowitz

ITEM	YES	NO	N/A	COMMENTS
Sample results included?	X			
Reporting Limits met project requirements?	X			
Field I.D. included?	X			
Laboratory I.D. included?	X			
Sample matrix included?	X			
Sample receipt temperature 2-6°C?	X			
Signed COCs included?	X			
Date of sample collection included?	X			
Date of sample digestion included?	X			
Holding time to digestion met criteria? (Soils -30 days from collection to digestion.)	X			
Date of analysis included?	X			
Holding time to analysis met criteria? (Soils -168 hours from digestion to analysis; Aqueous - 24 hours from collection to analysis.)	X			
Method reference included?	X			
Laboratory Case Narrative included?	X			

Definitions: MDL Method Detection Limit; %R Percent Recovery; RL Reporting Limit; RPD Relative Percent Difference; RSD Relative Standard Deviation :Corr Correlation Coefficient.

ITEM	YES	NO	N/A	COMMENTS
Initial calibration documentation included in lab package?	X			
1) Blank plus 4 standards (7196A) or blank plus 3 standards (7199)	X			
2) Correlation coefficient of =0.995 (7196A) or =0.999 (7199)	X			
3) Calibrate daily or each time instrument is set up.	X			
Calibration Check Standard (CCS) for 7196A and Quality Control Sample (QCS) for 7199 Included in Lab Package?	X			
1) %R criteria met? (90 - 110%)	X			
2) Correct frequency of one per every 10 samples	X			
3) CCS and QCS from independent source and at mid-level of calibration curve	X			
Calibration Blanks	X			
1) Analyzed prior to initial calibration standards and after each CCS/QCS?	X			
2) Absolute value should not exceed MDL.	X			
Method Blank, Field Blanks and/or Equipment Blanks Included in Lab Package?	X			
1) Method blank analyzed with each preparation batch?	X			
2) Absolute value should not exceed MDL.	X			
Eh and pH Data	X			
1) Eh and pH data was included and plotted for all samples?	X			
Soluble Matrix Spike Data Included in Lab Package?	X			
1) Soluble Matrix %R criteria met? (75-125%R).		X		See nonconformance table
2) Was the spike concentration 40 mg/Kg or twice the sample concentration?	X			
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	X			
Insoluble Matrix Spike Data Included in Lab Package?	X			
1) Insoluble Matrix %R criteria met? (75-125%R).	X			
2) Was the spike concentration around 400 to 800 mg/Kg?	X			
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	X			

ITEM	YES	NO	N/A	COMMENTS
Post Digestion Spike	X			
1) Post Digestion Spike %R criteria met? (85-115%R).	X			
2) Was the spike concentration 40 mg/Kg or twice the sample concentration?	X			
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	X			
Sample Duplicate Data Included in Lab Package?	X			
1) RPD criteria met? (RPD ≤ 20%) if both results are ≤4x RL or absolute difference ≤ RL if either or both results are <4xRL	X			
2) Was a sample duplicate analyzed at the frequency of 1 per batch or 20 samples?	X			
Was a Laboratory Control Sample (LCS) Included in Lab Package?	X			
1) %R criteria met? (80-120%R).	X			
2) Was an LCS analyzed at the frequency of 1/batch or 20 samples?	X			
Were any Field Duplicate samples submitted with this SDG?	X			JB96351-7/8
1) Were Field duplicate RPD criteria met? (RPD≤50% for both sample results >5xRL or professional judgement if either or both results are <5xRL.	X			
Were all sample quantitation and reporting requirements met?	X			
1) Were all solid samples reported with percent solids > 50%?	X			
2) Were any samples analyzed or reported with dilutions?		X		
Miscellaneous Items	X			
1) For soils by 7196A, was the pH within a range of 7.0-8.0?	X			
2) For soils by 7199, was the pH within a range of 9.0-9.5?			X	
3) For aqueous by 7196A, was the pH with a range of 1.5-2.5?	X			
4) For soils (3060A), was the digestion temperature 90-95C for at least 60 minutes?	X			
5) For 7199, was each sample injected twice and was the RPD =20?			X	

SDG#: JB96351/ Method 7196A

Batch: GN27193

Cr+6 ICAL 6/17/2015

Soil

(p. 68 of data pkg)

x - concentration	y - response
0	0
0.01	0.009
0.05	0.044
0.1	0.084
0.3	0.252
0.5	0.437
0.8	0.684
1	0.869

(p. 68 of data pkg)

AECOM Calculated Offset	-0.0011	OK	Reported Offset	-0.0011
AECOM Slope	0.8653	OK	Reported Slope	0.8653
AECOM Calculated r	0.99990	OK	Reported r	0.99990

LCS calculation

GP89877-B1

P.42,68

Background Absorbance	0
Total absorbance	0.844
Total absorbance - background	0.84400
Instrument Concentration	0.977
Sample weight (mg/kg)	0.0025
Final Volume (L)	0.1
Dilution Factor	1

AECOM Calculated LCS Result (mg/Kg)	39.1	OK	Reported Result (mg/Kg)	39.1
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%R = Found/True*100

GP89877-B1

P.42,68

True Value (mg/kg)	40
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AECOM Calculated %R	97.7	OK rounding	Reported %R	97.8
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MS calculation

GP89877-S1

P.44,68

Background reading	0.002
Total absorbance	0.536
Total absorbance - background	0.534
Instrument Concentration	0.618
Sample weight (mg/kg)	0.00246
Final Volume (L)	0.1
Percent solids	0.8
Dilution Factor	1

AECOM Calculated MS Result (mg/Kg)	31.4	OK	Reported Result (mg/Kg)	31.4
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%R = Found/True*100

GP89877-S1

P.44,68

True Value (mg/kg)	50.8
--------------------	------

Native concentration (mg/Kg)	0.31
------------------------------	------

AECOM %R	61.3	OK rounding	Reported %R	61.2
----------	------	-------------	-------------	------

Percent Solids

P.46

FSI10-17.0-17.5

Empty dish weight=	26.71
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Wet weight=	35.35
-------------	-------

Dry weight=	33.62
-------------	-------

AECOM %solids =	80.0	OK	Reported %solids=	80.0
-----------------	------	----	-------------------	------

Reporting Limit		P.22	FSI10-17.0-17.5
Low Standard	0.01		
Initial weight (mg/kg)	0.00242		
Final volume (L)	0.1		
Percent solids	0.800		
Dilution Factor	1		
Reporting Limit	0.52	OK rounding	Reported RL (mg/Kg)= 0.50

Sample Calculations		P.22,68	FSI10-17.0-17.5
Background reading	0.002		
Total absorbance	0.006		
Total absorbance - background	0.004		
Instrument Response	0.006		
Sample weight (mg/kg)	0.00242		
Final Volume (L)	0.1		
Percent solids	0.800		
Dilution Factor	1		
AECOM Calculated Result (mg/Kg)	0.31	OK	Reported Result (mg/Kg) 0.31

Nonconformance Tables**Matrix Spikes**

Sample ID	Lab ID	Analyte	Matrix Spike	% Recovery	Lower Limit	Upper Limit
FSI10-17.0-17.5	JB96351-15	CHROMIUM (HEXAVALENT)	Soluble	61.2	75	125
FSI10-17.0-17.5	JB96351-15R	CHROMIUM (HEXAVALENT)	Soluble	71.4	75	125

Field Duplicate

Analyte	FSI10-1.0-1.5 mg/kg	RL mg/kg	FSI10-1.0-1.5X mg/kg	RL mg/kg	RPD (%)	Actions	Associated Samples
Hexavalent Chromium	2.8	0.42	1.7	0.42	48.9%	None	All soils submitted in this SDG
Hexavalent Chromium	0.29	0.42	1.9	0.42	147.0%	None, Abs Diff < RL	

Client Name: PPG Industries	Project Number: 60279173.GA.RI.RPT.FOR
Site Location: PPG Garfield Avenue – Forrest Street Additional Remedial Investigation (GARIS)	Project Manager: Bill Spronz
Laboratory: Accutest, Dayton, NJ	Type of Validation: Limited
Laboratory Job No: JB96351A	Date Checked: 7/23/2015
Validator: Justin Webster	Peer: Lisa Krowitz

ITEM	YES	NO	N/A	COMMENTS
Sample results included?	X			
Reporting Limits met project requirements?	X			
Field I.D. included?	X			
Laboratory I.D. included?	X			
Sample matrix included?	X			
Sample receipt temperature 2-6C?	X			
Signed COCs included?	X			
Date of sample collection included?	X			
Date of sample digestion included?	X			
Date of analysis included?	X			
Holding time met QC criteria? (Aqueous – 28 days HCl to pH < 2, Cool, ≤ 6 °C)	X			
Method reference included?	X			
Laboratory Case Narrative included?	X			

Definitions: MDL - Method Detection Limit; %R - Percent Recovery; RL - Reporting Limit; RPD - Relative Percent Difference; RSD - Relative Standard Deviation ;Corr - Correlation Coefficient.

ITEM	YES	NO	N/A	COMMENTS
Sample dilutions?		X		
Initial calibration documentation included in lab package?			X	N/A for Limited Validation
1) Calibrate daily or each time instrument is set up.			X	
2) ICP (6010) -Blank plus 1 standard? If no, reject (R) data.			X	
3) Hg (7470/7471) -Blank plus 5 standards? If no, reject (R) data.			X	
Initial Calibration Verification Standard (ICV) for ICP (6010) and Initial Calibration Check Standard (ICCS) for Hg (7470/7471) included in lab package?			X	N/A for Limited Validation
1) Analyzed immediately after initial calibration? If no, reject (R) data.			X	
2) %R criteria met? (90-110%). If no, J positive results for affected analyte(s) if %R between 80-89% and 111-120% and indicate bias; UJ non-detect results for affected analyte(s) if %R between 80-89%, and R all data for affected analyte(s) if %R <80% or >120%.			X	
3) Spot check ICV/ICCS results for several analytes.			X	
Continuing Calibration Verification Standard (CCV) for ICP (6010) and Calibration Check Standard (CCS) for Hg (7470/7471) included in Lab Package?			X	N/A for Limited Validation
1) Analyzed immediately after each ICV/ICC/CB and after every 10 samples? If no, reject (R) data.			X	
2) CCS and CCV from independent source and at mid-level of calibration curve. If no, reject (R) data.			X	
3) %R criteria met? (90-110%R). If no, J positive results for affected analyte(s) if %R between 80-89% and 111-120% and indicate bias; UJ non-detect results for affected analyte(s) if %R between 80-89% and R all data for affected analyte(s) if %R <80% or >120%.			X	
4) Spot check CCV/CCS results for several analytes.			X	
Low Calibration Standard (CRI) included in Lab Package?			X	N/A for Limited Validation
1) %R criteria met? - 50-150% for Co, Mn, Zn, by ICP-MS; Pb, Tl by 6010; 70-130% all others. If no, refer to ILM05.4 NJ SOP 5.A.2 for actions.			X	

ITEM	YES	NO	N/A	COMMENTS
Calibration Blanks			X	N/A for Limited Validation
1) Analyzed after daily calibration and after each ICV/ICC/CCV/CCS and after every 10 samples? If no, reject (R) data.			X	
2) Absolute value <3xIDL? If no, -if sample result <10x CB result, qualify affected analyte(s) in associated samples with CB; -if sample result >10xCB result, no qualification.			X	
Method Blank Included in Lab Package?	X			
1) Method blank analyzed with each preparation batch or every SDG, or 1/20 samples? If no, reject (R) data, except no aqueous MB required for FB/EB if only soil samples were analyzed.	X			
2) Method blank analyzed 1/20 samples? If - MB 1/25, J sample results from 21-25; -MB >1/25, R sample results after 25th sample.	X			
3) MB results nondetect? If no, -sample result <3xMB, negate UB; -sample result>3xMB but <10xMB, JB; -sample result >10xMB, no qualification.		X		See nonconformance table
4) Negative MB result reported? If yes, -Positive sample result<10xMB, qualify estimated, biased low (J); -Non-detect sample result, qualify UJ, may be false non-detect.	X			See nonconformance table
Field Blanks/Equipment Blanks Included in Lab Package?	X			
1) FB/EB result non-detect? If no, -sample result <3xFB/EB, negate U; -sample result>3xFB/EB but <10xMB, J; -sample result >10xFB/EB, no qualification.		X		See nonconformance table
Interference Check Standards (ICSA and ICSB) included in Lab Package?	X			
1) Analyzed at beginning of analytical run? If no, reject (R) data.	X			
2) %R criteria met? (80-120%) If no, %R>120%, no qualification if sample result non-detect; %R between 121-150%, J positive results, biased high; %R between 50-79%, J/UJ results, biased low; %R<50% or >150%, reject (R) result	X			
3) Spot check accuracy of %Rs	X			

ITEM	YES	NO	N/A	COMMENTS
Matrix Spike/Matrix Spike Duplicate Data Included in Lab Package?	X			
1) MS/MSD %R (75-125%R) and RPD (+20% aq or 35% soils for SR>5xRL or absolute difference <RL for SR<5xRL) criteria met? - %R>125% J positive results for affected analyte(s) for all samples in the same batch, accept NDs; -%R<75% J/UJ for affected analyte(s) for all samples in the same batch; - RPD outside limits J positive results for affected analyte(s) for all samples in the same batch/SDG, accept NDs. If absolute difference >RL for SR<5xRL estimate positive results and nondetects for affected analyte(s) for all samples in the same batch. For Hg same as above except Abs Diff between MS and MSD must be ≤ 2xRL.		X		See nonconformance table
2) Was a sample spiked at the frequency of 1/batch or 20 samples?	X			
3) Was the MS performed on a site sample?	X			FSH17.0-17.5
4) Was the MS performed on a FB/EB or TB? If yes, J all sample data.		X		
Post Digestion Spike		X		
1) %R criteria met? (80-120%R) - %R>120% J positive results for affected analyte(s) for all samples in the same batch/SDG, accept NDs. - %R<80% J/UJ affected analyte(s) for all samples in the same batch.			X	
2) Was the spike performed on a FB/EB or TB? If yes, J all sample data.			X	
3) Was a sample spiked at the frequency of 1/batch or 20 samples?			X	
Laboratory Duplicate Data Included in Lab Package?	X			MS/MSD
Aqueous - If RPD is >35% for SR≤5xRL estimate (J) results.- If absolute difference is >RL for SR <RL estimate (J) positive and nondetects (UJ).- For Hg – Aq ≤ 20%,	X			
Soil -- If RPD is >50% for SR≤5xRL estimate (J) results.- If absolute difference is >RL for SR <RL estimate (J) positive and nondetects (UJ).- For Hg Soil/Sediment ≤ 35%,	X			

ITEM	YES	NO	N/A	COMMENTS
Was a Laboratory Control Sample (LCS) Included in Lab Package?	X			
1) LCS %R criteria met? (80-120%R or within vendor limits). If no, J/UJ all affected analytes(s) for all samples in the same batch/SDG.	X			
2) Was an LCS analyzed at the frequency of 1/batch or 20 samples? If no, J/UJ affected analyte(s) for all samples in the same batch/SDG.	X			
Serial Dilution	X			
1) %D (<10%R) criteria met? - If analyte concentration >10xRL and %D >10% J positive results for affected analyte(s) for all samples in the same batch, accept NDs.	X			
2) Was the frequency 1/batch or 20 samples?	X			
3) Was a site sample used?	X			
4) Was a FB/EB or TB used? If yes, J all sample data.		X		
5) Spot check accuracy of %Ds.	X			
Field Duplicate Data included in Lab Package?	X			
Aqueous - If RPD is >30% for SR≤5xRL estimate (J) results.- If absolute difference is >RL for SR <RL estimate (J) positive and nondetects (UJ).-			X	
Soil -- If RPD is >50% for SR≤5xRL estimate (J) results.- If absolute difference is >RL for SR <RL estimate (J) positive and nondetects (UJ).-	X			
Percent Solids data included in Lab Package?	X			
1) %Solids criteria (Reg 2 criteria) met? (≥50%)	X			

Nonconformance Tables**Blanks****Batch MP87033**

Analyte	Result	3x	10x	Actions	Associated Samples
Aqueous Method Blank	mg/kg	ug/l	ug/l		
Antimony	-0.3	-0.9	-3	(UJ) nondetects and (J) results < 10x negative blank concentration	FB-20150605
Thallium	-1.5	-4.5	-15		
Vanadium	-0.2	-0.6	-2		

Batch MP87071

Analyte	Result	3x	10x	Actions	Associated Samples
Soil Method Blank	mg/kg	mg/kg	mg/kg		
Thallium	-0.081	-0.243	-0.81	(UJ) nondetects and (J) results < 10x negative blank concentration	All soil samples collected in this SDG

Equipment Blank FB-20150605

Analyte	Result	3x	10x	Actions	Associated Samples
Soil Method Blank	mg/kg	ug/l	ug/l		
Nickel	2	6	20	None, all associated soil results > 10X EB contamination.	All soil samples collected in this SDG

Matrix Spike/Matrix Spike Duplicate**Batch MP86071**

Analyte	MS	MSD	RPD	Actions	Associated Samples
	mg/kg	mg/kg	mg/kg		
Antimony	63.6	62.2	1.3	Estimate bias low	All soil samples collected in this SDG

Field Duplicate

Analyte	FSI10-1.0-1.5 mg/kg	RL mg/kg	FSI10-1.0-1.5X mg/kg	RL mg/kg	RPD (%)	Actions	Associated Samples
Antimony	2.2 U	2.2	0.48	2.0	NC	None	All soils collected in this SDG
Chromium	28.6	1.1	32.0	1.0	11.2%	None	
Nickel	15.9	4.4	13.0	4.0	20.1%	None	
Thallium	0.21	1.1	1.0 U	1.0	NC	None	
Vanadium	34.1	5.5	34.2	5.0	0.3%	None	

Note:

NC - Not Calculated

Data Validation Report

Project:	PPG Garfield Avenue – Forrest Street Additional Remedial Investigation (GARIS)	
Laboratory:	Accutest, Dayton, NJ	
Laboratory Job No.:	JB96462 and JB96462A	
Analysis/Method:	Hexavalent Chromium SW846 3060A/7196 Select Metals SW846 3050B/6010C	
Validation Level:	Full (Hexavalent Chromium) Limited (Antimony, Chromium, Nickel, Thallium, Vanadium)	
Site Location/Address:	90 & 98 Forrest Street Jersey City, NJ	
AECOM Project No:	60279173.GA.RI.RPT.FOR	
Prepared by:	Kristin Rutherford /AECOM	Completed on: 7/23/2015
Reviewed by:	Lisa Krowitz/AECOM	File Name: JB96462_A 2015_7_23 DV Report-F

Introduction

The data were reviewed in accordance with the FSP-QAPP and the following NJDEP guidance documents and validation Standard Operating Procedures (SOP):

- NJDEP Office of Data Quality SOP 5.A.10, Rev 3 (September 2009), SOP for Analytical Data Validation of Hexavalent Chromium - for USEPA SW-846 Method 3060A, and USEPA SW-846 Method 7196A;
- NJDEP Office of Data Quality SOP 5.A.16, Rev 1 (May 2002), Quality Assurance Data Validation of Analytical Deliverables for Inorganics (based on USEPA SW-846 Methods)
- Data Quality Assessment and Data Usability Evaluation Technical Guidance, version 1.0, April 2014;
- Data of Known Quality Protocols Technical Guidance, version 1.0, April 2014.

The results of quality control data analyzed with site samples were used to assess the overall reliability of the data. The following qualifiers were used to identify data quality issues

- U: Indicates the analyte was not detected in the sample above the sample reporting limit.
- J: Indicates the result was an estimated value; the associated numerical value was an approximate concentration of the analyte in the sample.

- UJ: Indicates the analyte was not detected above the reporting limit and the reporting limit was approximate.
- UB: The analyte concentration is less than or equal to three (3) times the concentration in the associated method/prep blank. The presence of the analyte in the sample is negated (UB) due to laboratory contamination.
- JB: The analyte concentration is greater than three (3) times, but less than or equal to ten (10) times the concentration in the associated method/prep blank. The presence of that analyte in the sample is considered "real". The concentration is quantitatively qualified (JB) due to method blank contamination.
- R: The sample result was rejected due to serious deficiencies; the presence or absence of the analyte could not be confirmed.
- RA: The sample result was rejected but is still considered usable.

Sample Information

The samples listed below were collected by AECOM on June 6 and 8, 2015 as part of the PPG Garfield Avenue – Forrest Street Additional Remedial Investigation (GARIS) sampling at 90 & 98 Forrest Street Jersey City, NJ. Only the samples and parameters listed below were validated.

Field ID	Laboratory ID	Matrix	Fraction
FSI1A-GWU-1.0-2.5	JB96462-1,1A	Aqueous	Hexavalent Chromium, Total Chromium
FB-20150608 (Field Blank)	JB96462-2,2A	Aqueous	Hexavalent Chromium, Select Metals
FSI1A-GWF-1.0-2.5	JB96462-3,3A	Aqueous	Hexavalent Chromium, Total Chromium
FSI1A-0.8-1.3	JB96462-4,4A	Soil	Hexavalent Chromium, Select Metals

The samples were collected following the procedures detailed in the Forrest Street Additional Remedial Investigation Work Plan dated April 27, 2015.

General Comments

The data package was complete. Quality control (QC) issues identified during validation are discussed below. Refer to the Target Analyte Summary Hit(s) in Attachment A for a listing of all detected results, qualified results, and associated qualifications, where applicable. The nonconformances for each section discussed below are presented in Attachment B.

The samples were received by the laboratory at 1.0°C, which is outside the criteria of 4±2°C. Based on professional judgment, since the samples were received in good condition on ice, no qualifications were made.

Hexavalent Chromium

Holding Time

The field blank sample, FB-20150608, was received by the laboratory past holding time criteria; therefore, the nondetect result for hexavalent chromium in FB-20150608 was qualified (UJ) as estimated with the potential for low bias.

Method Blank

Hexavalent chromium was detected in the MB associated with soil sample FSI1A-0.8-1.3, at a concentration above the method detection limit (MDL), but below the reporting limit (RL). Hexavalent chromium was detected in sample FSI1A-0.8-1.3 at a concentration less than three times the amount in the method blank; therefore, the result was negated (U) at the RL.

MS Results

Soil

Sample FSI1A-0.8-1.3 (JB96462-4) was selected for the soil matrix spike (MS) analysis and was used for supporting data quality recommendations. The soluble and insoluble MS recoveries (%Rs) from the initial batch were 89.1% and 97.9%, respectively, which met quality control (QC) criteria of 75-125%R. The post digestion spike (PDS) recovery was 96.5%, which met the PDS criteria of 85-115%.

Groundwater

Unfiltered sample FSI1A-GWU-1.0-2.5 (JB96462-1) was used as a source sample for the MS analysis in this SDG. The initial MS recovery was 18.7%, which was below the QC requirements of 75-125%R. The post-spike recovery was 106.7%, which met QC requirements of 85-115%R. The nondetect result for hexavalent chromium in sample FSI1A-GWU-1.0-2.5 was qualified as rejected (RA) with the potential for low bias.

Filtered sample FSI1A-GWU-1.0-2.5 (JB96462-3) was also selected as a source sample for the MS analysis in this SDG. The initial MS recovery was 100%, which met the QC requirements of 85-115%R. No data qualification was necessary on this basis.

Sample Results

The concentration of total chromium was compared to the concentration of hexavalent chromium to ensure that the total chromium concentration was greater than the hexavalent chromium concentration. No data were qualified on this basis.

TAL Metals

Method Blank

Nickel was detected in the MB associated with the field blank, FB-20150608, collected in this SDG, at concentration above the MDL, but below the RL; therefore, the nickel result in FB-20150608, which was detected between the MDL and RL, was negated (U) at the RL.

Sample Results

TAL metals results (flagged B by the laboratory) that were less than the RL, but greater than or equal to the MDL are approximate values and have been qualified as estimated (J).

Data Quality and Usability

In general, these data appear to be valid and may be used for decision-making purposes. The nondetect hexavalent chromium result in sample FSI1A-GWU-1.0-2.5 was rejected, but may be usable as discussed below. Qualified results are presented in Attachments A and B.

The hexavalent chromium result in field blank FB-20150608 is usable as an estimated nondetect result with low bias due to holding time exceedance.

The hexavalent chromium result in sample FSI1A-0.8-1.3 is usable as a nondetect result due to method blank contamination.

The hexavalent chromium result in unfiltered groundwater sample FSI1A-GWU-1.0-2.5 was rejected since the MS %R was below 50%, but the PDS recovery was acceptable, thus the result is usable as an estimated value with low bias due to low MS recovery.

The nickel result in field blank FB-20150608 is usable as a nondetect result due to method blank contamination.

Sample results reported between the MDL and RL are usable as estimated values with an unknown directional bias.

ATTACHMENTS

Attachment A: Target Analyte Summary Hitlist(s)

Attachment B: Data Validation Report Form

Attachment A

Target Analyte Summary Hitlist(s)

Soil Target Analyte Summary Hit List Hexavalent Chromium

Site Name PPG Garfield Avenue – Forrest Street Additional Remedial Investigation (GARIS)
Sampling Date June 6, 2015
Lab Name/ID Accutest, Dayton, NJ
SDG No JB96462
Sample Matrix Soil
Trip Blank ID NA
Field Blank ID FB-20150608

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
FS11A-0.8-1.3	JB96462-4	CHROMIUM (HEXAVALENT)	U	0.74	U	0.49	Negate	1

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

NJDEP Soil Hexavalent Chromium Laboratory Footnote

1. The value reported is less than or equal to 3x the value in the preparation/reagent blank. It is the policy of NJDEP-DPF SR to negate the reported value due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
2. The value reported is greater than three (3) times but less than ten (10) times the value in the preparation/reagent blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to the preparation/reagent blank contamination. The "B" qualifier alerts the end-user to the presence of this analyte in the preparation/reagent blank.
3. The value reported is less than or equal to three (3) times the value in the trip/field blank. It is the policy of NJDEP-DPF SR to negate the reported value as due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
4. The value reported is greater than three (3) times but less than ten (10) times the value in the trip/field blanks and is considered "real". However, the reported value must be quantitatively qualified "J" due to trip/field blank contamination.
5. The concentration reported by the laboratory is incorrectly calculated.

6. The laboratory failed to report the presence of the analyte in the sample.
7. The reported Hexavalent Chromium value was qualified because the Calibration Check Standard was not within the recovery range (90-110 percent).
8. In the Duplicate Sample Analysis, Hexavalent Chromium fell outside the control limits of ≤ 20 percent for sample results $> 4xRL$ or $+ RL$ for sample results $< 4xRL$. Therefore, the result was qualified.
9. This analyte was rejected because the laboratory performed the Duplicate Analysis on a field blank.
10. The reported value was qualified because the PVS recovery was greater than 115 percent.
11. The reported value was qualified because the PVS recovery was less than 85 percent.
12. The non-detected value was qualified (UJ) because the PVS recovery was less than 85 percent. The possibility of a false negative exists.
13. The reported analyte was qualified because the associated Calibration Blank result was greater than the MDL.
14. The laboratory made a transcription error. No hits were found in the raw data.
15. This analyte is rejected because the laboratory exceeded the holding time for digestion and analysis.
16. The laboratory subtracted the preparation/reagent blank from the sample result. The Reviewer's calculation puts the preparation/reagent blank back into the result.
17. The photocopy is unreadable. Therefore, the QA reviewer cannot read the laboratory's reported concentration result.
18. The reported value was qualified because the predigestion spike recovery was less than 75 %, but greater than 50%.
19. The reported value was qualified because the predigestion spike recovery was greater than 125 percent.
20. The non-detected value was qualified (UJ) because the predigestion and or redigestion spike recovery was less than 75 percent. The possibility of a false negative exists.
21. The reported result was qualified or rejected because the laboratory did not record the pH value(s) of the sample in a laboratory notebook.

22. The reported value was qualified (J/UJ) because the sample moisture content exceeded 50 percent.
23. The sample result was rejected because the soluble and insoluble matrix spike recoveries were less than 50%.
24. The detected sample result was qualified (J) because the incorrect spike concentration was used.
25. The reported sample results were rejected because the predigestion spike recovery was greater than 150 percent.
26. The reported sample results were rejected because the redigestion spike recovery was greater than 150 percent.
27. The reported value was qualified (J) because the redigestion spike recovery was less than 75 percent.
28. The reported value was qualified (J/UJ) because the sample digestion temperature was less than 90C.
29. In the Field Duplicate Sample Analysis, Hexavalent Chromium fell outside the control limits of < 50% for sample results > 5xRL.
30. The reported value was qualified as estimated (J/UJ) but the bias is uncertain due to both high and low MS recoveries.
31. The reported result was greater than the MDL but less than the RL and qualified (J) as estimated by the laboratory.
32. The reported value was qualified because the sample replicate precision criterion of < 20% for method 7199 was exceeded.
33. The reported value was qualified (J/UJ) because the laboratory control sample (LCS) recovery was less than 80%.
34. The reported value was qualified (J) because the laboratory control sample (LCS) recovery was greater than 120%.
35. The reported result was qualified because the matrix spike analysis was not performed at the proper frequency.
36. The reported result was qualified because the laboratory duplicate analysis was not performed at the proper frequency.
37. The result was qualified because the cooler temperature upon sample receipt exceeded 6°C.

Aqueous Target Analyte Summary Hit List Hexavalent Chromium

Site Name PPG Garfield Avenue – Forrest Street Additional Remedial Investigation (GARIS)
Sampling Date June 6 and 8, 2015
Lab Name/ID Accutest, Dayton, NJ
SDG No JB96462
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID FB-20150608

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
FB-20150608	JB96462-2	CHROMIUM (HEXAVALENT)	U	U	U	0.010	Qualify	11
FS11A-GWU-1.0-2.5	JB96462-1	CHROMIUM (HEXAVALENT)	U	U	U	0.010	Reject	12

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

NJDEP Aqueous Hexavalent Chromium Laboratory Footnote

- The value reported is less than or equal to 3x the value in the preparation/reagent blank. It is the policy of NJDEP-DPFSR to negate the reported value due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
- The value reported is greater than three (3) times but less than ten (10) times the value in the preparation/reagent blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to the preparation/reagent blank contamination. The "B" qualifier alerts the end-user to the presence of this analyte in the preparation/reagent blank.
- The value reported is less than or equal to three (3) times the value in the trip/field blank. It is the policy of NJDEP-DPFSR to negate the reported value as due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
- The value reported is greater than three (3) times but less than ten (10) times the value in the trip/field blanks and is considered "real". However, the reported value must be quantitatively qualified "J" due to trip/field blank contamination.
- The concentration reported by the laboratory is incorrectly calculated.

6. The laboratory failed to report the presence of the analyte in the sample.
7. The reported value was qualified because the Calibration Verification Standard was not within the recovery range (90-110 percent).
8. In the MS/MSD Sample Analysis, this analyte fell outside the control limits of 20% RPD. Therefore, the result was qualified.
9. This analyte was qualified because the laboratory performed the MS/MSD Analysis on a field blank.
10. The reported analyte was qualified because the associated Calibration Blank result was greater than the MDL.
11. This analyte is rejected or qualified because the laboratory exceeded the holding time for digestion and analysis.
12. The laboratory subtracted the method blank from the sample result. The reviewer's calculation has added the method blank result to the reported concentration.
13. The photocopy submitted is illegible. Therefore, the QA reviewer cannot read the laboratory's reported concentration result.
14. The reported or nondetected value was qualified because the MS/MSD spike recovery was less than 75 percent.
15. The reported value was qualified because the MS/MSD spike recovery was greater than 125 percent.
16. The reported value was qualified as estimated (J/UJ) but the bias is uncertain due to both high and low MS recoveries.
17. The reported values were qualified because the laboratory duplicate exceeded 20 percent RPD or the absolute difference exceeded the reporting limit for sample results < 4X the reporting limit.
18. The reported value(s) was qualified as estimated (J) because the field duplicate RPD was >30% for SR<5xRL, or the absolute difference was >RL for SR <RL, in which case the reported value(s) were estimated (J) positive and nondetects (UJ).
19. The reported value was qualified because the LCS recovery was less than 80 percent.
20. The reported result was greater than the MDL but less than the RL and qualified (J) as estimated by the laboratory.
21. The reported value was qualified because the LCS recovery was greater than 120 percent.
22. The reported value was qualified because of negative instrument drift.

23. The dissolved result was > the total result and the relative percent difference between the total and dissolved results fell outside the control limits of < 20% for sample results > 4xRL or absolute difference of +/- RL for sample results < 4xRL. Therefore, the results in both the total and dissolved fractions were qualified.
24. The dissolved hexavalent chromium result was > the dissolved chromium result or the total hexavalent chromium result was > the total chromium result and the relative percent difference between the total and dissolved results fell outside the control limits of < 20% for sample results > 4xRL or absolute difference of +/- RL for sample results < 4xRL. Therefore, the results were qualified.
25. The reported value was qualified and the nondetect result was rejected because the MS/MSD spike recovery was less than 50 percent.

Soil Target Analyte Summary Hit List (Metals)

Site Name PPG Garfield Avenue – Forrest Street Additional Remedial Investigation (GARIS)
Sampling Date June 6, 2015
Lab Name/ID Accutest, Dayton, NJ
SDG No JB96462A
Sample Matrix Soil
Trip Blank ID NA
Field Blank ID FB-20150608

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
FSI1A-0.8-1.3	JB96462-4A	ANTIMONY	U	0.42B	0.42	2.6		
FSI1A-0.8-1.3	JB96462-4A	CHROMIUM	U	24.3	24.3	1.3		
FSI1A-0.8-1.3	JB96462-4A	NICKEL	U	23.1	23.1	5.1		
FSI1A-0.8-1.3	JB96462-4A	VANADIUM	U	15.7	15.7	6.4		

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

NJDEP Soil Metals Laboratory Footnotes

1. The value reported is less than or equal to 3x the value in the method blank. It is the policy of NJDEP-DPFSR to negate the reported value due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
2. The value reported is greater than three (3) but less than ten (10) times the value in the method blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to the method blank contamination. The "B" qualifier alerts the end-user to the presence of this analyte in the method blank.
3. The value reported is less than or equal to 3x the value in the trip/field blank. It is the policy of NJDEP-DPFSR to negate the reported value as due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.

4. The value reported is greater than 3x but less than ten (10) the value in the trip/field blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to trip/field blank contamination.
5. The concentration reported by the laboratory is incorrectly calculated.
6. The laboratory failed to report the presence of the analyte in the sample.
7. The reported metal value was qualified because the Calibration Verification Standard was not within the recovery range (90-110 percent).
8. In the MS/MSD Sample Analysis, this analyte fell outside the control limits of 20% RPD. Therefore, the result was qualified.
9. This analyte was qualified because the laboratory performed the MS/MSD Analysis on a field blank.
10. The reported analyte was qualified because the associated Calibration Blank result was greater than the MDL.
11. The reported value was qualified because serial dilution analysis was not within QC limit of 10% D.
12. This analyte is qualified or rejected because the laboratory exceeded the holding time for digestion and analysis.
13. The laboratory subtracted the method blank from the sample result. The reviewer's calculation has added the method blank result to the reported concentration.
14. The photocopy submitted is illegible. Therefore, the QA reviewer cannot read the laboratory's reported concentration result.
15. The reported or nondetected value was qualified because the MS/MSD spike recovery was less than 75 percent.
16. The reported value was qualified because the MS/MSD spike recovery was greater than 125 percent.
17. The reported value was qualified as estimated (J/UJ) but the bias is uncertain due to both high and low MS recoveries.
18. The reported values were qualified because the laboratory duplicate exceeded 35 percent RPD or the absolute difference exceeded the reporting limit for sample results < 5X the reporting limit.
19. The reported value was qualified because the field duplicate exceeded 50 percent RPD for results > 5X the reporting limit.
20. The reported value was qualified because the LCS recovery was less than 80 percent.

21. The reported value was qualified because the sample moisture content was greater than 50 percent.
22. The reported result was greater than the MDL but less than the RL and qualified (J) as estimated by the laboratory.
23. The reported value was qualified because the LCS recovery was greater than 120 percent.
24. The reported value was qualified because of negative instrument drift.
25. The reported value was qualified as estimated (J/UJ) but the bias is uncertain due to either an acceptable MS recovery and high or low MSD recovery, or acceptable MSD recovery and a high or low MS recovery.
26. The reported calculated value was negated since one or both of the values in the calculation were negated.

Aqueous Target Analyte Summary Hit List (Metals)

Site Name PPG Garfield Avenue – Forrest Street Additional Remedial Investigation (GARIS)
Sampling Date June 6 and 8, 2015
Lab Name/ID Accutest, Dayton, NJ
SDG No JB96462A
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID FB-20150608

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/L)	Laboratory Sample Result (mg/L)	Validation Sample Result (mg/LK)	RL (mg/L)	Quality Assurance Decision	NJDEP Validation Footnote
FSI1A-GWU-1.0-2.5	JB96462-1A	CHROMIUM	U	10.9	10.9	10		
FB-20150608	JB96462-2A	NICKEL	U	1.2B	U	10	Negate	1

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

Aqueous Metals NJDEP Laboratory Footnotes

1. The value reported is less than or equal to 3x the value in the method blank. It is the policy of NJDEP-DPF SR to negate the reported value due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
2. The value reported is greater than three (3) but less than ten (10) times the value in the method blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to the method blank contamination. The "B" qualifier alerts the end-user to the presence of this analyte in the method blank.
3. The value reported is less than or equal to 3x the value in the trip/field blank. It is the policy of NJDEP-DPF SR to negate the reported value as due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
4. The value reported is greater than 3x but less than ten (10) the value in the trip/field blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to trip/field blank contamination.
5. The concentration reported by the laboratory is incorrectly calculated.

6. The laboratory failed to report the presence of the analyte in the sample.
7. The reported metal value was qualified because the Calibration Verification Standard was not within the recovery range (90-110 percent).
8. In the MS/MSD Sample Analysis, this analyte fell outside the control limits of 20% RPD. Therefore, the result was qualified.
9. This analyte was qualified because the laboratory performed the MS/MSD Analysis on a field blank.
10. The reported analyte was qualified because the associated Calibration Blank result was greater than the MDL.
11. The reported value was qualified because serial dilution analysis was not within QC limit of 10% D.
12. This analyte is rejected or qualified because the laboratory exceeded the holding time for digestion and analysis.
13. The laboratory subtracted the method blank from the sample result. The reviewer's calculation has added the method blank result to the reported concentration.
14. The photocopy submitted is illegible. Therefore, the QA reviewer cannot read the laboratory's reported concentration result.
15. The reported or nondetected value was qualified because the MS/MSD spike recovery was less than 75 percent for metals or less than 90% for wet chem.
16. The reported value was qualified because the MS/MSD spike recovery was greater than 125 percent for metals or greater than 110% for wet chem.
17. The reported value was qualified as estimated (J/UJ) but the bias is uncertain due to both high and low MS recoveries.
18. The reported values were qualified because the laboratory duplicate exceeded 20 percent RPD or the absolute difference exceeded the reporting limit for sample results < 5X the reporting limit.
19. The reported value was qualified because the field duplicate exceeded 30 percent RPD for results > 5X the reporting limit.
20. The reported value was qualified because the LCS recovery was less than 80 percent.
21. The reported result was greater than the MDL but less than the RL and qualified (J) as estimated by the laboratory.

22. The reported value was qualified because the LCS recovery was greater than 120 percent.
23. The reported value was qualified because of negative instrument drift.

Attachment B

Data Validation Report Form

Client Name: PPG Industries	Project Number: 60314351.GA.DE.PDI.P3
Site Location: PPG Garfield Avenue – Forrest Street Additional Remedial Investigation (GARIS)	Project Manager: Bill Spronz
Laboratory: Accutest, Dayton, NJ	Type of Validation: Full
Laboratory Job No: JB96462	Date Checked: 7/23/2015
Validator: Kristin Rutherford	Peer: Lisa Krowitz

ITEM	YES	NO	N/A	COMMENTS
Sample results included?	X			
Reporting Limits met project requirements?	X			
Field I.D. included?	X			
Laboratory I.D. included?	X			
Sample matrix included?	X			
Sample receipt temperature 2-6°C?		X		Temp 1°C. No qualifications - samples received in good condition on ice.
Signed COCs included?	X			
Date of sample collection included?	X			
Date of sample digestion included?	X			
Holding time to digestion met criteria? (Soils -30 days from collection to digestion.)	X			
Date of analysis included?	X			
Holding time to analysis met criteria? (Soils -168 hours from digestion to analysis; Aqueous - 24 hours from collection to analysis.)		X		FB 20150606 rec'd outside holding time; qualify (UJ).
Method reference included?	X			
Laboratory Case Narrative included?	X			

Definitions: MDL Method Detection Limit; %R Percent Recovery; RL Reporting Limit; RPD Relative Percent Difference; RSD Relative Standard Deviation :Corr Correlation Coefficient.

ITEM	YES	NO	N/A	COMMENTS
Initial calibration documentation included in lab package?	X			
1) Blank plus 4 standards (7196A) or blank plus 3 standards (7199)	X			
2) Correlation coefficient of =0.995 (7196A) or =0.999 (7199)	X			
3) Calibrate daily or each time instrument is set up.	X			
Calibration Check Standard (CCS) for 7196A and Quality Control Sample (QCS) for 7199 Included in Lab Package?	X			
1) %R criteria met? (90 - 110%)	X			
2) Correct frequency of one per every 10 samples	X			
3) CCS and QCS from independent source and at mid-level of calibration curve	X			
Calibration Blanks	X			
1) Analyzed prior to initial calibration standards and after each CCS/QCS?	X			
2) Absolute value should not exceed MDL.		X		CCBs assoc with soil sample >MDL. No qualification since result was negated due to MB.
Method Blank, Field Blanks and/or Equipment Blanks Included in Lab Package?	X			FB20150608 ND
1) Method blank analyzed with each preparation batch?	X			
2) Absolute value should not exceed MDL.		X		Soil MB GP89673/GN26821 0.26 mg/kg. Negate (U) Cr6 in soil sample FSI1A-0.8-1.3.
Eh and pH Data	X			
1) Eh and pH data was included and plotted for all samples?	X			
Soluble Matrix Spike Data Included in Lab Package?	X			
1) Soluble Matrix %R criteria met? (75-125%R).		X		See nonconformance table. JB96462-1 (AQ) below criteria; JB96462-3 (AQ) OK, JB96462-4 (SO) ok
2) Was the spike concentration 40 mg/Kg or twice the sample concentration?		X		soil spike 49.7mg/kg; no impact to data.
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	X			

ITEM	YES	NO	N/A	COMMENTS
Insoluble Matrix Spike Data Included in Lab Package?	X			
1) Insoluble Matrix %R criteria met? (75-125%R).	X			
2) Was the spike concentration around 400 to 800 mg/Kg?		X		insol spike 863mg/kg; no impact to data.
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	X			
Post Digestion Spike	X			
1) Post Digestion Spike %R criteria met? (85-115%R).	X			
2) Was the spike concentration 40 mg/Kg or twice the sample concentration?	X			
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	X			
Sample Duplicate Data Included in Lab Package?	X			
1) RPD criteria met? (RPD ≤ 20%) if both results are ≤4x RL or absolute difference ≤ RL if either or both results are <4xRL	X			
2) Was a sample duplicate analyzed at the frequency of 1 per batch or 20 samples?	X			
Was a Laboratory Control Sample (LCS) Included in Lab Package?	X			
1) %R criteria met? (80-120%R).	X			
2) Was an LCS analyzed at the frequency of 1/batch or 20 samples?	X			
Were any Field Duplicate samples submitted with this SDG?		X		
1) Were Field duplicate RPD criteria met? (RPD≤50% for both sample results >5xRL or professional judgement if either or both results are <5xRL.			X	
Were all sample quantitation and reporting requirements met?	X			
1) Were all solid samples reported with percent solids > 50%?	X			
2) Were any samples analyzed or reported with dilutions?		X		no dilutions

ITEM	YES	NO	N/A	COMMENTS
Miscellaneous Items	X			
1) For soils by 7196A, was the pH within a range of 7.0-8.0?	X			
2) For soils by 7199, was the pH within a range of 9.0-9.5?			X	
3) For aqueous by 7196A, was the pH within a range of 1.5-2.5?	X			
4) For soils (3060A), was the digestion temperature 90-95C for at least 60 minutes?	X			
5) For 7199, was each sample injected twice and was the RPD =20?			X	

Nonconformance Tables

Blanks

Batch GP89673/GN26821

Analyte	Result	3x	10x	Actions	Associated Samples
	mg/kg	mg/kg	mg/kg		
CHROMIUM (HEXAVALENT)	0.26	0.78	2.6	Negate result <3X MB	FSI1A-0.8-1.3

Matrix Spikes

Sample ID	Lab ID	Analyte	Matrix Spike	% Recovery	Lower Limit	Upper Limit
FSI1A-GWU-1.0-2.5	JB96462-1	CHROMIUM (HEXAVALENT)	Soluble	18.7	85	115
FSI1A-GWU-1.0-2.5	JB96462-1	CHROMIUM (HEXAVALENT)	Post Spike	106.7	85	115
FSI1A-GWF-1.0-2.5	JB96462-3	CHROMIUM (HEXAVALENT)	Soluble	100.0	85	115
FSI1A-0.8-1.3	JB96462-4	CHROMIUM (HEXAVALENT)	Soluble	89.1	75	125
FSI1A-0.8-1.3	JB96462-4	CHROMIUM (HEXAVALENT)	Insoluble	97.9	75	125
FSI1A-0.8-1.3	JB96462-4	CHROMIUM (HEXAVALENT)	PDS	96.5	85	115

SDG#: JB96462/ Method 7196

Batch: GN26821

Cr+6 ICAL 6/9/15
Soil
(p. 40 of data pkg)

x - concentration	y - response
0	0
0.01	0.009
0.05	0.041
0.1	0.083
0.3	0.249
0.5	0.408
0.8	0.661
1	0.830

(p. 40 of data pkg)

AECOM Calculated Offset	-0.0004	OK	Reported Offset	-0.0004
AECOM Slope	0.8276	OK	Reported Slope	0.8276
AECOM Calculated r	0.99997	OK	Reported r	0.99997

LCS calculation

GP89673-B1

P. 40, 20

Background Absorbance 0
Total absorbance 0.695
Total absorbance - background 0.695
Instrument Concentration 0.840
Sample weight (mg/kg) 0.0025
Final Volume (L) 0.1
Dilution Factor 1

AECOM Calculated LCS Result (mg/Kg)	33.6	OK	Reported Result (mg/Kg)	33.6
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%R = Found/True*100

GP89673-B1

P. 40, 20

True Value (mg/kg) 40

AECOM Calculated %R	84.0	OK	Reported %R	84.0
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MS calculation

GP89673-S1

P. 22,40

JB96462-4

Background reading 0.002
Total absorbance 0.751
Total absorbance - background 0.749
Instrument Concentration 0.9055
Sample weight (mg/kg) 0.00248
Final Volume (L) 0.1
Percent solids 0.811
Dilution Factor 1

AECOM Calculated MS Result (mg/Kg)	45.0	OK	Reported Result (mg/Kg)	45.0
------------------------------------	------	----	-------------------------	------

%R = Found/True*100

GP89673-S1

P. 22,40

JB96462-4

True Value (mg/kg) 49.7
Native concentration (mg/Kg) 0.74

AECOM %R	89.1	OK	Reported %R	89.1
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Percent Solids

JB96462-4

P. 23

FS11A-0.8-1.3

Empty dish weight= 21.07
Wet weight= 30.10
Dry weight= 28.39

AECOM %solids =	81.1	OK	Reported %solids=	81.1
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Reporting Limit	JB96462-4	P. 40, 11	FSI1A-0.8-1.3
Low Standard	0.01		
Initial weight (mg/kg)	0.00249		
Final volume (L)	0.1		
Percent solids	0.811		
Dilution Factor	1		
Reporting Limit	0.50	OK	Reported RL (mg/Kg)= 0.49

Sample Calculations	JB96462-4	P. 40, 11	FSI1A-0.8-1.3
Background reading	0.001		
Total absorbance	0.013		
Total absorbance - background	0.012		
Instrument Response	0.015		
Sample weight (mg/kg)	0.00249		
Final Volume (L)	0.1		
Percent solids	0.811		
Dilution Factor	1		
AECOM Calculated Result (mg/Kg)	0.74	OK	Reported Result (mg/Kg) 0.74

Client Name: PPG Industries				Project Number: 60279173.GA.RI.RPT.FOR	
Site Location: PPG Garfield Avenue – Forrest Street Additional Remedial Investigation (GARIS)				Project Manager: Bill Spronz	
Laboratory: Accutest, Dayton, NJ				Type of Validation: Limited	
Laboratory Job No: JB96462A				Date Checked: 7/23/2015	
Validator: Kristin Rutherford				Peer: Lisa Krowitz	
ITEM	YES	NO	N/A	COMMENTS	
Sample results included?	X				
Reporting Limits met project requirements?	X				
Field I.D. included?	X				
Laboratory I.D. included?	X				
Sample matrix included?	X				
Sample receipt temperature 2-6C?		X		Temp 1°C. No qualifications - samples received in good condition on ice.	
Signed COCs included?	X				
Date of sample collection included?	X				
Date of sample digestion included?	X				
Date of analysis included?	X				
Holding time met QC criteria? (Aqueous – 28 days HCl to pH < 2, Cool, ≤ 6 °C)	X				
Method reference included?	X				
Laboratory Case Narrative included?	X				
Definitions: MDL - Method Detection Limit; %R - Percent Recovery; RL - Reporting Limit; RPD - Relative Percent Difference; RSD - Relative Standard Deviation ;Corr - Correlation Coefficient.					

ITEM	YES	NO	N/A	COMMENTS
Sample dilutions?		X		no dilutions
Initial calibration documentation included in lab package?			X	N/A for Limited Validation
1) Calibrate daily or each time instrument is set up.			X	
2) ICP (6010) -Blank plus 1 standard? If no, reject (R) data.			X	
3) Hg (7470/7471) -Blank plus 5 standards? If no, reject (R) data.			X	
Initial Calibration Verification Standard (ICV) for ICP (6010) and Initial Calibration Check Standard (ICCS) for Hg (7470/7471) included in lab package?			X	N/A for Limited Validation
1) Analyzed immediately after initial calibration? If no, reject (R) data.			X	
2) %R criteria met? (90-110%). If no, J positive results for affected analyte(s) if %R between 80-89% and 111-120% and indicate bias; UJ non-detect results for affected analyte(s) if %R between 80-89%, and R all data for affected analyte(s) if %R <80% or >120%.			X	
3) Spot check ICV/ICCS results for several analytes.			X	
Continuing Calibration Verification Standard (CCV) for ICP (6010) and Calibration Check Standard (CCS) for Hg (7470/7471) included in Lab Package?			X	N/A for Limited Validation
1) Analyzed immediately after each ICV/ICC/CB and after every 10 samples? If no, reject (R) data.			X	
2) CCS and CCV from independent source and at mid-level of calibration curve. If no, reject (R) data.			X	
3) %R criteria met? (90-110%R). If no, J positive results for affected analyte(s) if %R between 80-89% and 111-120% and indicate bias; UJ non-detect results for affected analyte(s) if %R between 80-89% and R all data for affected analyte(s) if %R <80% or >120%.			X	
4) Spot check CCV/CCS results for several analytes.			X	
Low Calibration Standard (CRI) included in Lab Package?			X	N/A for Limited Validation
1) %R criteria met? - 50-150% for Co, Mn, Zn, by ICP-MS; Pb, Tl by 6010; 70-130% all others. If no, refer to ILM05.4 NJ SOP 5.A.2 for actions.			X	

ITEM	YES	NO	N/A	COMMENTS
Calibration Blanks			X	N/A for Limited Validation
1) Analyzed after daily calibration and after each ICV/ICC/CCV/CCS and after every 10 samples? If no, reject (R) data.			X	
2) Absolute value <3xIDL? If no, -if sample result <10x CB result, qualify affected analyte(s) in associated samples with CB; -if sample result >10xCB result, no qualification.			X	
Method Blank Included in Lab Package?	X			
1) Method blank analyzed with each preparation batch or every SDG, or 1/20 samples? If no, reject (R) data, except no aqueous MB required for FB/EB if only soil samples were analyzed.	X			
2) Method blank analyzed 1/20 samples? If - MB 1/25, J sample results from 21-25; -MB >1/25, R sample results after 25th sample.	X			
3) MB results nondetect? If no, -sample result <3xMB, negate UB; -sample result>3xMB but <10xMB, JB; -sample result >10xMB, no qualification.		X		See nonconformance table. Negate (U) Ni in FB-20150608.
4) Negative MB result reported? If yes, -Positive sample result<10xMB, qualify estimated, biased low (J); -Non-detect sample result, qualify UJ, may be false non-detect.		X		
Field Blanks/Equipment Blanks Included in Lab Package?	X			
1) FB/EB result non-detect? If no, -sample result <3xFB/EB, negate U; -sample result>3xFB/EB but <10xMB, J; -sample result >10xFB/EB, no qualification.		X		See nonconformance table. Ni (1.2 ug/L). No qualifications based on FB since result was negated due to MB.
Interference Check Standards (ICSA and ICSB) included in Lab Package?	X			
1) Analyzed at beginning of analytical run? If no, reject (R) data.	X			
2) %R criteria met? (80-120%) If no, %R>120%, no qualification if sample result non-detect; %R between 121-150%, J positive results, biased high; %R between 50-79%, J/UJ results, biased low; %R<50% or >150%, reject (R) result	X			
3) Spot check accuracy of %Rs	X			

ITEM	YES	NO	N/A	COMMENTS
Matrix Spike/Matrix Spike Duplicate Data Included in Lab Package?	X			
1) MS/MSD %R (75-125%R) and RPD (+20% aq or 35% soils for SR \geq 5xRL or absolute difference <RL for SR<5xRL) criteria met? - %R>125% J positive results for affected analyte(s) for all samples in the same batch, accept NDs; -%R<75% J/UJ for affected analyte(s) for all samples in the same batch; - RPD outside limits J positive results for affected analyte(s) for all samples in the same batch/SDG, accept NDs. If absolute difference >RL for SR<5xRL estimate positive results and nondetects for affected analyte(s) for all samples in the same batch. For Hg same as above except Abs Diff between MS and MSD must be \leq 2xRL.	X			FSI1A-GWU-1.0-2.5 and FSI1A-GWF-1.0-2.5 for Total Cr only; recoveries within limits. MS for AQ and SO TAL metals not performed on site sample. Batch QC not assessed.
2) Was a sample spiked at the frequency of 1/batch or 20 samples?	X			
3) Was the MS performed on a site sample?		X		FSI1A-GWU-1.0-2.5 and FSI1A-GWF-1.0-2.5 for Total Cr only; recoveries within limits. MS for AQ and SO TAL metals not performed on site sample.
4) Was the MS performed on a FB/EB or TB? If yes, J all sample data.		X		
Post Digestion Spike		X		
1) %R criteria met? (80-120%R) - %R>120% J positive results for affected analyte(s) for all samples in the same batch/SDG, accept NDs. - %R<80% J/UJ affected analyte(s) for all samples in the same batch.			X	
2) Was the spike performed on a FB/EB or TB? If yes, J all sample data.			X	
3) Was a sample spiked at the frequency of 1/batch or 20 samples?			X	
Laboratory Duplicate Data Included in Lab Package?	X			see MS/MSD
Aqueous - If RPD is >35% for SR \leq 5xRL estimate (J) results.- If absolute difference is >RL for SR <RL estimate (J) positive and nondetects (UJ).- For Hg – Aq \leq 20%,	X			
Soil -- If RPD is >50% for SR \leq 5xRL estimate (J) results.- If absolute difference is >RL for SR <RL estimate (J) positive and nondetects (UJ).- For Hg Soil/Sediment \leq 35%,	X			

ITEM	YES	NO	N/A	COMMENTS
Was a Laboratory Control Sample (LCS) Included in Lab Package?	X			
1) LCS %R criteria met? (80-120%R or within vendor limits). If no, J/UJ all affected analytes(s) for all samples in the same batch/SDG.	X			
2) Was an LCS analyzed at the frequency of 1/batch or 20 samples? If no, J/UJ affected analyte(s) for all samples in the same batch/SDG.	X			
Serial Dilution	X			
1) %D (<10%R) criteria met? - If analyte concentration >10xRL and %D >10% J positive results for affected analyte(s) for all samples in the same batch, accept NDs.	X			Total Cr only
2) Was the frequency 1/batch or 20 samples?	X			
3) Was a site sample used?	X			FSI1A-GWU-1.0-2.5 and FSI1A-GWF-1.0-2.5 for Total Cr only; %D within limits (results <50xIDL). SD for AQ and SO TAL metals not performed on site sample. Batch QC not assessed.
4) Was a FB/EB or TB used? If yes, J all sample data.		X		
5) Spot check accuracy of %Ds.	X			
Field Duplicate Data included in Lab Package?		X		
Aqueous - If RPD is >30% for SR≤5xRL estimate (J) results.- If absolute difference is >RL for SR <RL estimate (J) positive and nondetects (UJ).-			X	
Soil -- If RPD is >50% for SR≤5xRL estimate (J) results.- If absolute difference is >RL for SR <RL estimate (J) positive and nondetects (UJ).-			X	
Percent Solids data included in Lab Package?	X			
1) %Solids criteria (Reg 2 criteria) met? (≥50%)	X			

Nonconformance Tables**Blanks****Batch MP87016**

Analyte	Result	3x	10x	Actions	Associated Samples
Aqueous Method Blank	ug/L	ug/L	ug/L		
Nickel	0.80	2.4	8.0	Negate result <3X MB	FB-20150608

Batch MP87038

Analyte	Result	3x	10x	Actions	Associated Samples
Soil Method Blank	mg/kg	mg/kg	mg/kg		
Chromium	0.10	0.30	1.0	None, result >10X MB	FSI1A-0.8-1.3

FB-20150608

Analyte	Result	3x	10x	Actions	Associated Samples
Field Blank	ug/L	ug/L	ug/L		
Nickel	1.2	3.6	12	None, result in FB negated due to MB.	FSI1A-0.8-1.3

Serial Dilution**Batch MP87006**

Analyte	Original	5x dilution	% DIF	Actions	Associated Samples
FSI1A-GWU-1.0-2.5	ug/L	ug/L	ug/L		
Chromium	10.9	46.1	322.9	None, results <50X IDL.	FSI1A-GWU-1.0-2.5

Batch MP87093

Analyte	Original	5x dilution	% DIF	Actions	Associated Samples
FSI1A-GWF-1.0-2.5	ug/L	ug/L	ug/L		
Chromium	0.600	3.60	500.0	None, results <50X IDL.	FSI1A-GWF-1.0-2.5

Data Validation Report

Project:	PPG Garfield Avenue – Forrest Street Additional Remedial Investigation (GARIS)	
Laboratory:	Accutest, Dayton, NJ	
Laboratory Job No.:	JB96576, JB96576A	
Analysis/Method:	Hexavalent Chromium SW846 3060A/7196 Select Metals SW846 3050B/6010C	
Validation Level:	Full (Hexavalent Chromium) Limited (Antimony, Chromium, Nickel, Thallium, Vanadium)	
Site Location/Address:	90 & 98 Forrest Street Jersey City, NJ	
AECOM Project No:	60279173.GA.RI.RPT.FOR	
Prepared by:	Kristin Rutherford /AECOM	Completed on: 7/22/2015
Reviewed by:	Lisa Krowitz/AECOM	File Name: JB96576_A_2015_07_22_DV Report-F

Introduction

The data were reviewed in accordance with the FSP-QAPP and the following NJDEP guidance documents and validation Standard Operating Procedures (SOP):

- NJDEP Office of Data Quality SOP 5.A.10, Rev 3 (September 2009), SOP for Analytical Data Validation of Hexavalent Chromium - for USEPA SW-846 Method 3060A, and USEPA SW-846 Method 7196A;
- NJDEP Office of Data Quality SOP 5.A.16, Rev 1 (May 2002), Quality Assurance Data Validation of Analytical Deliverables for Inorganics (based on USEPA SW-846 Methods)
- Data Quality Assessment and Data Usability Evaluation Technical Guidance, version 1.0, April 2014;
- Data of Known Quality Protocols Technical Guidance, version 1.0, April 2014;

The results of quality control data analyzed with site samples were used to assess the overall reliability of the data. The following qualifiers were used to identify data quality issues

- U: Indicates the analyte was not detected in the sample above the sample reporting limit.
- J: Indicates the result was an estimated value; the associated numerical value was an approximate concentration of the analyte in the sample.

- UJ: Indicates the analyte was not detected above the reporting limit and the reporting limit was approximate.
- UB: The analyte concentration is less than or equal to three (3) times the concentration in the associated method/prep blank. The presence of the analyte in the sample is negated (UB) due to laboratory contamination.
- JB: The analyte concentration is greater than three (3) times, but less than or equal to ten (10) times the concentration in the associated method/prep blank. The presence of that analyte in the sample is considered "real". The concentration is quantitatively qualified (JB) due to method blank contamination.
- R: The sample result was rejected due to serious deficiencies; the presence or absence of the analyte could not be confirmed.
- RA: The sample result was rejected but is still considered usable.

Sample Information

The samples listed below were collected by AECOM on June 9, 2015 as part of the PPG Garfield Avenue – Forrest Street Additional Remedial Investigation (GARIS) sampling at 90 & 98 Forrest Street Jersey City, New Jersey. Only the samples and parameters listed below were validated.

Field ID	Laboratory ID	Matrix	Fraction
FB-20150609 (Equipment Blank)	JB96576-1, -1A	Aqueous	Hexavalent Chromium and Metals
FSI5A-2.0-2.5	JB96576-2, -2A	Soil	Hexavalent Chromium, Select Metals
FSI5A-3.0-3.5	JB96576-3, -3A	Soil	Hexavalent Chromium, Select Metals
FSI5A-5.0-5.5	JB96576-4, -4A	Soil	Hexavalent Chromium, Select Metals
FSI5A-5.0-5.5X (Field Duplicate of FSI5A-5.0-5.5)	JB96576-5, -5A	Soil	Hexavalent Chromium, Select Metals
FSI5A-7.0-7.5	JB96576-6, -6A	Soil	Hexavalent Chromium, Select Metals
FSI5A-9.0-9.5	JB96576-7, -7A	Soil	Hexavalent Chromium, Select Metals
FSI5A-11.0-11.5	JB96576-8, -8A	Soil	Hexavalent Chromium, Select Metals

The samples were collected following the procedures detailed in the Forrest Street Additional Remedial Investigation Work Plan dated April 27, 2015.

General Comments

The data package was complete. Quality control (QC) issues identified during validation are discussed below. Refer to the Target Analyte Summary Hit(s) in Attachment A for a listing of all detected results, qualified results, and associated qualifications, where applicable. The nonconformances for each section discussed below are presented in Attachment B.

Hexavalent Chromium

Continuing Calibration Blank

Hexavalent chromium was detected in the continuing calibration blank (CCB) associated with sample FSI5A-11.0-11.5 in this data set at a concentration above the method detection limit (MDL), but below the reporting limit (RL). The hexavalent chromium result in this sample was detected between the MDL and RL, and thus was negated (U) at the RL.

MS Results

Sample FSI5A-11.0-11.5 was selected for the matrix spike (MS) analysis associated with the samples in this SDG and was used for supporting data quality recommendations. The soluble and insoluble MS recoveries were 104.1 and 108.9%, respectively; which met the quality control criteria of 75-125%. The post digestion spike (PDS) recovery was 112%, which met the PDS criteria of 85-115%. No data qualification was required on the basis of spike recoveries.

Field Duplicate Results

Samples FSI5A-5.0-5.5 and FSI5A-5.0-5.5X were collected as the field duplicate (FD) pair in this SDG. Hexavalent chromium met the precision criteria of absolute difference less than the RL for sample results $\leq 5 \times \text{RL}$.

Sample Results

The concentration of total chromium was compared to the concentration of hexavalent chromium to ensure that the total chromium concentration was greater than the hexavalent chromium concentration. No data were qualified on this basis.

Hexavalent chromium results (flagged B by the laboratory) that were less than the RL, but greater than or equal to the MDL are approximate values and have been qualified as estimated (J).

TAL Metals

Method Blank

Antimony was detected in the MB associated with the soil samples collected in this SDG, at a concentration above the MDL, but below the RL. Antimony was detected in sample FSI5A-11.0-11.5 between the MDL and RL, and at a concentration less than three times the amount in the method blank; therefore, the result was negated (U) at the RL.

Matrix Spike/Matrix Spike Duplicate (MS/MSD)

Site sample FSI5A-11.0-11.5 (JB96576-8A) was used for the MS/MSD analysis in association with the soil samples collected in this SDG. The MS and/or MSD for antimony was recovered at levels less than 75% indicating possible matrix interferences and the potential for biased low sample results. All antimony soil sample results within this SDG were qualified (UJ) as estimated with the potential for low bias.

Field Duplicate Results

Samples FSI5A-5.0-5.5 and FSI5A-5.0-5.5X were collected as the field duplicate pair in this SDG. Precision criteria were met for all analytes.

Sample Results

Metals results (flagged B by the laboratory) that were less than the RL, but greater than or equal to the MDL are approximate values and have been qualified as estimated (J).

Data Quality and Usability

In general, these data appear to be valid and may be used for decision-making purposes. No data were rejected. Qualified results are presented in Attachments A and B.

The hexavalent chromium result in sample FSI5A-11.0-11.is usable as an estimated value with potential for high bias due to laboratory blank contamination.

The antimony result in sample FSI5A-11.0-11.is usable as a nondetect result due to laboratory blank contamination.

Antimony results qualified due to low MS/MSD recovery are usable as estimated values with low bias.

Sample results reported between the MDL and RL are usable as estimated values with an unknown directional bias.

ATTACHMENTS

Attachment A: Target Analyte Summary Hitlist(s)

Attachment B: Data Validation Report Form

Attachment A

Target Analyte Summary Hitlist(s)

Soil Target Analyte Summary Hit List Hexavalent Chromium

Site Name PPG Garfield Avenue – Forrest Street Additional Remedial Investigation (GARIS)
Sampling Date June 9, 2015
Lab Name/ID Accutest, Dayton, NJ
SDG No JB96576
Sample Matrix Soil
Trip Blank ID NA
Field Blank ID FB-20150609

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
FSI5A-11.0-11.5	JB96576-8	CHROMIUM (HEXAVALENT)	U	0.34B	U	0.49	Negate	1
FSI5A-2.0-2.5	JB96576-2	CHROMIUM (HEXAVALENT)	U	0.40B	0.40	0.48		
FSI5A-3.0-3.5	JB96576-3	CHROMIUM (HEXAVALENT)	U	0.42B	0.42	0.51		
FSI5A-5.0-5.5X	JB96576-5	CHROMIUM (HEXAVALENT)	U	0.35B	0.35	0.49		
FSI5A-7.0-7.5	JB96576-6	CHROMIUM (HEXAVALENT)	U	0.27B	0.27	0.47		
FSI5A-9.0-9.5	JB96576-7	CHROMIUM (HEXAVALENT)	U	0.34B	0.34	0.49		

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

NJDEP Soil Hexavalent Chromium Laboratory Footnote

- The value reported is less than or equal to 3x the value in the preparation/reagent blank. It is the policy of NJDEP-DPFSR to negate the reported value due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
- The value reported is greater than three (3) times but less than ten (10) times the value in the preparation/reagent blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to the preparation/reagent blank contamination. The "B" qualifier alerts the end-user to the presence of this analyte in the preparation/reagent blank.
- The value reported is less than or equal to three (3) times the value in the trip/field blank. It is the policy of NJDEP-DPFSR to negate the reported value as due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.

4. The value reported is greater than three (3) times but less than ten (10) times the value in the trip/field blanks and is considered "real". However, the reported value must be quantitatively qualified "J" due to trip/field blank contamination.
5. The concentration reported by the laboratory is incorrectly calculated.
6. The laboratory failed to report the presence of the analyte in the sample.
7. The reported Hexavalent Chromium value was qualified because the Calibration Check Standard was not within the recovery range (90-110 percent).
8. In the Duplicate Sample Analysis, Hexavalent Chromium fell outside the control limits of ≤ 20 percent for sample results $> 4xRL$ or $+ RL$ for sample results $< 4xRL$. Therefore, the result was qualified.
9. This analyte was rejected because the laboratory performed the Duplicate Analysis on a field blank.
10. The reported value was qualified because the PVS recovery was greater than 115 percent.
11. The reported value was qualified because the PVS recovery was less than 85 percent.
12. The non-detected value was qualified (UJ) because the PVS recovery was less than 85 percent. The possibility of a false negative exists.
13. The reported analyte was qualified because the associated Calibration Blank result was greater than the MDL.
14. The laboratory made a transcription error. No hits were found in the raw data.
15. This analyte is rejected because the laboratory exceeded the holding time for digestion and analysis.
16. The laboratory subtracted the preparation/reagent blank from the sample result. The Reviewer's calculation puts the preparation/reagent blank back into the result.
17. The photocopy is unreadable. Therefore, the QA reviewer cannot read the laboratory's reported concentration result.
18. The reported value was qualified because the predigestion spike recovery was less than 75 %, but greater than 50%.
19. The reported value was qualified because the predigestion spike recovery was greater than 125 percent.

20. The non-detected value was qualified (UJ) because the predigestion and or redigestion spike recovery was less than 75 percent. The possibility of a false negative exists.
21. The reported result was qualified or rejected because the laboratory did not record the pH value(s) of the sample in a laboratory notebook.
22. The reported value was qualified (J/UJ) because the sample moisture content exceeded 50 percent.
23. The sample result was rejected because the soluble and insoluble matrix spike recoveries were less than 50%.
24. The detected sample result was qualified (J) because the incorrect spike concentration was used.
25. The reported sample results were rejected because the predigestion spike recovery was greater than 150 percent.
26. The reported sample results were rejected because the redigestion spike recovery was greater than 150 percent.
27. The reported value was qualified (J) because the redigestion spike recovery was less than 75 percent.
28. The reported value was qualified (J/UJ) because the sample digestion temperature was less than 90C.
29. In the Field Duplicate Sample Analysis, Hexavalent Chromium fell outside the control limits of < 50% for sample results > 5xRL.
30. The reported value was qualified as estimated (J/UJ) but the bias is uncertain due to both high and low MS recoveries.
31. The reported result was greater than the MDL but less than the RL and qualified (J) as estimated by the laboratory.
32. The reported value was qualified because the sample replicate precision criterion of < 20% for method 7199 was exceeded.
33. The reported value was qualified (J/UJ) because the laboratory control sample (LCS) recovery was less than 80%.
34. The reported value was qualified (J) because the laboratory control sample (LCS) recovery was greater than 120%.
35. The reported result was qualified because the matrix spike analysis was not performed at the proper frequency.
36. The reported result was qualified because the laboratory duplicate analysis was not performed at the proper frequency.

37. The result was qualified because the cooler temperature upon sample receipt exceeded 6°C.

Soil Target Analyte Summary Hit List (TAL Metals)

Site Name PPG Garfield Avenue – Forrest Street Additional Remedial Investigation (GARIS)
Sampling Date June 9, 2015
Lab Name/ID Accutest, Dayton, NJ
SDG No JB96576A
Sample Matrix Soil
Trip Blank ID NA
Field Blank ID FB-20150609

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
FSI5A-2.0-2.5	JB96576-2A	ANTIMONY	U	U	U	2.3	Qualify	15
FSI5A-3.0-3.5	JB96576-3A	ANTIMONY	U	U	U	2.6	Qualify	15
FSI5A-5.0-5.5	JB96576-4A	ANTIMONY	U	U	U	2.4	Qualify	15
FSI5A-5.0-5.5X	JB96576-5A	ANTIMONY	U	U	U	2.5	Qualify	15
FSI5A-7.0-7.5	JB96576-6A	ANTIMONY	U	U	U	2.3	Qualify	15
FSI5A-9.0-9.5	JB96576-7A	ANTIMONY	U	U	U	2.4	Qualify	15
FSI5A-11.0-11.5	JB96576-8A	ANTIMONY	U	0.39B	U	2.5	Negate, Qualify	1,15
FSI5A-2.0-2.5	JB96576-2A	CHROMIUM	U	8.7	8.7	1.2		
FSI5A-3.0-3.5	JB96576-3A	CHROMIUM	U	25.7	25.7	1.3		
FSI5A-5.0-5.5	JB96576-4A	CHROMIUM	U	13.0	13.0	1.2		
FSI5A-5.0-5.5X	JB96576-5A	CHROMIUM	U	10.6	10.6	1.3		
FSI5A-7.0-7.5	JB96576-6A	CHROMIUM	U	12.7	12.7	1.2		
FSI5A-9.0-9.5	JB96576-7A	CHROMIUM	U	10	10	1.2		
FSI5A-11.0-11.5	JB96576-8A	CHROMIUM	U	7.7	7.7	1.2		
FSI5A-2.0-2.5	JB96576-2A	NICKEL	U	8.0	8.0	4.7		
FSI5A-3.0-3.5	JB96576-3A	NICKEL	U	12.1	12.1	5.1		
FSI5A-5.0-5.5	JB96576-4A	NICKEL	U	10.0	10.0	4.8		

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
FSI5A-5.0-5.5X	JB96576-5A	NICKEL	U	8.2	8.2	5.0		
FSI5A-7.0-7.5	JB96576-6A	NICKEL	U	9.0	9.0	4.7		
FSI5A-9.0-9.5	JB96576-7A	NICKEL	U	6.8	6.8	4.8		
FSI5A-11.0-11.5	JB96576-8A	NICKEL	U	7.6	7.6	4.9		
FSI5A-2.0-2.5	JB96576-2A	VANADIUM	U	10.8	10.8	5.9		
FSI5A-3.0-3.5	JB96576-3A	VANADIUM	U	16.9	16.9	6.4		
FSI5A-5.0-5.5	JB96576-4A	VANADIUM	U	18.7	18.7	6.0		
FSI5A-5.0-5.5X	JB96576-5A	VANADIUM	U	17.1	17.1	6.3		
FSI5A-7.0-7.5	JB96576-6A	VANADIUM	U	20.4	20.4	5.9		
FSI5A-9.0-9.5	JB96576-7A	VANADIUM	U	15.3	15.3	6.0		
FSI5A-11.0-11.5	JB96576-8A	VANADIUM	U	11.6	11.6	6.1		

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

NJDEP Soil Metals Laboratory Footnotes

1. The value reported is less than or equal to 3x the value in the method blank. It is the policy of NJDEP-DPFSR to negate the reported value due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
2. The value reported is greater than three (3) but less than ten (10) times the value in the method blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to the method blank contamination. The "B" qualifier alerts the end-user to the presence of this analyte in the method blank.
3. The value reported is less than or equal to 3x the value in the trip/field blank. It is the policy of NJDEP-DPFSR to negate the reported value as due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
4. The value reported is greater than 3x but less than ten (10) the value in the trip/field blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to trip/field blank contamination.

5. The concentration reported by the laboratory is incorrectly calculated.
6. The laboratory failed to report the presence of the analyte in the sample.
7. The reported metal value was qualified because the Calibration Verification Standard was not within the recovery range (90-110 percent).
8. In the MS/MSD Sample Analysis, this analyte fell outside the control limits of 20% RPD. Therefore, the result was qualified.
9. This analyte was qualified because the laboratory performed the MS/MSD Analysis on a field blank.
10. The reported analyte was qualified because the associated Calibration Blank result was greater than the MDL.
11. The reported value was qualified because serial dilution analysis was not within QC limit of 10% D.
12. This analyte is qualified or rejected because the laboratory exceeded the holding time for digestion and analysis.
13. The laboratory subtracted the method blank from the sample result. The reviewer's calculation has added the method blank result to the reported concentration.
14. The photocopy submitted is illegible. Therefore, the QA reviewer cannot read the laboratory's reported concentration result.
15. The reported or nondetected value was qualified because the MS/MSD spike recovery was less than 75 percent.
16. The reported value was qualified because the MS/MSD spike recovery was greater than 125 percent.
17. The reported value was qualified as estimated (J/UJ) but the bias is uncertain due to both high and low MS recoveries.
18. The reported values were qualified because the laboratory duplicate exceeded 35 percent RPD or the absolute difference exceeded the reporting limit for sample results < 5X the reporting limit.
19. The reported value was qualified because the field duplicate exceeded 50 percent RPD for results > 5X the reporting limit.
20. The reported value was qualified because the LCS recovery was less than 80 percent.
21. The reported value was qualified because the sample moisture content was greater than 50 percent.

22. The reported result was greater than the MDL but less than the RL and qualified (J) as estimated by the laboratory.
23. The reported value was qualified because the LCS recovery was greater than 120 percent.
24. The reported value was qualified because of negative instrument drift.
25. The reported value was qualified as estimated (J/UJ) but the bias is uncertain due to either an acceptable MS recovery and high or low MSD recovery, or acceptable MSD recovery and a high or low MS recovery.
26. The reported calculated value was negated since one or both of the values in the calculation were negated.

Attachment B

Data Validation Report Form

Client Name: PPG Industries	Project Number: 60279173.GA.RI.RPT.FOR
Site Location: PPG Garfield Avenue – Forrest Street Additional Remedial Investigation (GARIS)	Project Manager: Bill Spronz
Laboratory: Accutest, Dayton, NJ	Type of Validation: Full
Laboratory Job No: JB96576	Date Checked: 7/22/2015
Validator: Kristin Rutherford	Peer: Lisa Krowitz

ITEM	YES	NO	N/A	COMMENTS
Sample results included?	X			
Reporting Limits met project requirements?	X			
Field I.D. included?	X			
Laboratory I.D. included?	X			
Sample matrix included?	X			
Sample receipt temperature 2-6°C?	X			
Signed COCs included?	X			
Date of sample collection included?	X			
Date of sample digestion included?	X			
Holding time to digestion met criteria? (Soils -30 days from collection to digestion.)	X			
Date of analysis included?	X			
Holding time to analysis met criteria? (Soils -168 hours from digestion to analysis; Aqueous - 24 hours from collection to analysis.)	X			
Method reference included?	X			
Laboratory Case Narrative included?	X			

Definitions: MDL Method Detection Limit; %R Percent Recovery; RL Reporting Limit; RPD Relative Percent Difference; RSD Relative Standard Deviation :Corr Correlation Coefficient.

ITEM	YES	NO	N/A	COMMENTS
Initial calibration documentation included in lab package?	X			
1) Blank plus 4 standards (7196A) or blank plus 3 standards (7199)	X			
2) Correlation coefficient of =0.995 (7196A) or =0.999 (7199)	X			
3) Calibrate daily or each time instrument is set up.	X			
Calibration Check Standard (CCS) for 7196A and Quality Control Sample (QCS) for 7199 Included in Lab Package?	X			
1) %R criteria met? (90 - 110%)	X			
2) Correct frequency of one per every 10 samples	X			
3) CCS and QCS from independent source and at mid-level of calibration curve	X			
Calibration Blanks	X			
1) Analyzed prior to initial calibration standards and after each CCS/QCS?	X			
2) Absolute value should not exceed MDL.		X		GN27368 CCB 09:42 HexCr = 0.0033mg/L; qualify (J) JB96576-8
Method Blank, Field Blanks and/or Equipment Blanks Included in Lab Package?	X			
1) Method blank analyzed with each preparation batch?	X			
2) Absolute value should not exceed MDL.	X			
Eh and pH Data	X			
1) Eh and pH data was included and plotted for all samples?	X			
Soluble Matrix Spike Data Included in Lab Package?	X			
1) Soluble Matrix %R criteria met? (75-125%R).	X			
2) Was the spike concentration 40 mg/Kg or twice the sample concentration?		X		spike amt 48.7 mg/kg; no impact to data
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	X			
Insoluble Matrix Spike Data Included in Lab Package?	X			
1) Insoluble Matrix %R criteria met? (75-125%R).	X			
2) Was the spike concentration around 400 to 800 mg/Kg?		X		spike amt 1090 mg/kg; no impact to data
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	X			

ITEM	YES	NO	N/A	COMMENTS
Post Digestion Spike	X			
1) Post Digestion Spike %R criteria met? (85-115%R).	X			
2) Was the spike concentration 40 mg/Kg or twice the sample concentration?	X			
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	X			
Sample Duplicate Data Included in Lab Package?	X			
1) RPD criteria met? (RPD ≤ 20%) if both results are ≤4x RL or absolute difference ≤ RL if either or both results are <4xRL	X			
2) Was a sample duplicate analyzed at the frequency of 1 per batch or 20 samples?	X			
Was a Laboratory Control Sample (LCS) Included in Lab Package?	X			
1) %R criteria met? (80-120%R).	X			
2) Was an LCS analyzed at the frequency of 1/batch or 20 samples?	X			
Were any Field Duplicate samples submitted with this SDG?	X			FSI5A-5.0-5.5, FSI5A-5.0-5.5X
1) Were Field duplicate RPD criteria met? (RPD≤50% for both sample results >5xRL or professional judgement if either or both results are <5xRL.	X			
Were all sample quantitation and reporting requirements met?	X			
1) Were all solid samples reported with percent solids > 50%?	X			
2) Were any samples analyzed or reported with dilutions?		X		no dilutions
Miscellaneous Items	X			
1) For soils by 7196A, was the pH within a range of 7.0-8.0?	X			
2) For soils by 7199, was the pH within a range of 9.0-9.5?			X	
3) For aqueous by 7196A, was the pH with a range of 1.5-2.5?	X			
4) For soils (3060A), was the digestion temperature 90-95C for at least 60 minutes?	X			
5) For 7199, was each sample injected twice and was the RPD =20?			X	

Blanks

Batch GN27368

Analyte	Result	3x	10x	Actions	Associated Samples
CCB 06/18/15 09:42	mg/L	mg/L	mg/L		
CHROMIUM (HEXAVALENT)	0.0033	0.0099	0.033	Qualify positive results	FS15A-11.0-11.5

SDG#: JB96576/ Method 7196

Batch: GN27368

Cr+6 ICAL 6/18/15

Soil

(p. 52 of data pkg)

x - concentration	y - response
0	0
0.01	0.010
0.05	0.043
0.1	0.086
0.3	0.244
0.5	0.411
0.8	0.644
1	0.836

(p. 52 of data pkg)

AECOM Calculated Offset	0.0003	OK	Reported Offset	0.0003
AECOM Slope	0.8230	OK	Reported Slope	0.823
AECOM Calculated r	0.99971	OK	Reported r	0.99971

LCS calculation

GP89918-B1

P. 52, 29

Background Absorbance

0

Total absorbance

0.436

Total absorbance - background

0.436

Instrument Concentration

0.529

Sample weight (mg/kg)

0.0025

Final Volume (L)

0.1

Dilution Factor

2

AECOM Calculated LCS Result (mg/Kg)	42.4	OK	Reported Result (mg/Kg)	42.4
-------------------------------------	------	----	-------------------------	------

%R = Found/True*100

GP89918-B1

P. 52, 29

True Value (mg/kg)

40

AECOM Calculated %R	105.9	OK, rounding	Reported %R	106.0
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MS calculation

GP89918-S1

P. 52,31

JB96576-8

Background reading

0

Total absorbance

0.432

Total absorbance - background

0.432

Instrument Concentration

0.5245

Sample weight (mg/kg)

0.00249

Final Volume (L)

0.1

Percent solids

0.824

Dilution Factor

2

AECOM Calculated MS Result (mg/Kg)	51.1	OK	Reported Result (mg/Kg)	51.1
------------------------------------	------	----	-------------------------	------

%R = Found/True*100

GP89918-S1

P. 52,31

JB96576-8

True Value (mg/kg)

48.7

Native concentration (mg/Kg)

0.34

AECOM %R	104.3	OK, rounding	Reported %R	104.1
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Percent Solids

JB96576-8

P. 33

FS15A-11.0-11.5

Empty dish weight=

20.23

Wet weight=

27.90

Dry weight=

26.55

AECOM %solids =	82.4	OK	Reported %solids=	82.4
-----------------	------	----	-------------------	------

Reporting Limit	JB96576-8	P. 52, 16	FS15A-11.0-11.5
Low Standard	0.01		
Initial weight (mg/kg)	0.00245		
Final volume (L)	0.1		
Percent solids	0.824		
Dilution Factor	1		
Reporting Limit	0.50	OK	Reported RL (mg/Kg)= 0.49

Sample Calculations	JB96576-8	P. 52, 16	FS15A-11.0-11.5
Background reading	0.001		
Total absorbance	0.007		
Total absorbance - background	0.006		
Instrument Response	0.007		
Sample weight (mg/kg)	0.00245		
Final Volume (L)	0.1		
Percent solids	0.824		
Dilution Factor	1		
AECOM Calculated Result (mg/Kg)	0.34	OK	Reported Result (mg/Kg) 0.34

Client Name: PPG Industries				Project Number: 60279173.GA.RI.RPT.FOR	
Site Location: PPG Garfield Avenue – Forrest Street Additional Remedial Investigation (GARIS)				Project Manager: Bill Spronz	
Laboratory: Accutest, Dayton, NJ				Type of Validation: Limited	
Laboratory Job No: JB96576A				Date Checked: 7/22/2015	
Validator: Kristin Rutherford				Peer: Lisa Krowitz	
ITEM	YES	NO	N/A	COMMENTS	
Sample results included?	X				
Reporting Limits met project requirements?	X				
Field I.D. included?	X				
Laboratory I.D. included?	X				
Sample matrix included?	X				
Sample receipt temperature 2-6C?	X				
Signed COCs included?	X				
Date of sample collection included?	X				
Date of sample digestion included?	X				
Date of analysis included?	X				
Holding time met QC criteria? (Aqueous – 28 days HCl to pH < 2, Cool, ≤ 6 °C)	X				
Method reference included?	X				
Laboratory Case Narrative included?	X				
Definitions: MDL - Method Detection Limit; %R - Percent Recovery; RL - Reporting Limit; RPD - Relative Percent Difference; RSD - Relative Standard Deviation :Corr - Correlation Coefficient.					

ITEM	YES	NO	N/A	COMMENTS
Sample dilutions?		X		no dilutions
Initial calibration documentation included in lab package?			X	N/A for Limited Validation
1) Calibrate daily or each time instrument is set up.			X	
2) ICP (6010) -Blank plus 1 standard? If no, reject (R) data.			X	
3) Hg (7470/7471) -Blank plus 5 standards? If no, reject (R) data.			X	
Initial Calibration Verification Standard (ICV) for ICP (6010) and Initial Calibration Check Standard (ICCS) for Hg (7470/7471) included in lab package?			X	N/A for Limited Validation
1) Analyzed immediately after initial calibration? If no, reject (R) data.			X	
2) %R criteria met? (90-110%). If no, J positive results for affected analyte(s) if %R between 80-89% and 111-120% and indicate bias; UJ non-detect results for affected analyte(s) if %R between 80-89%, and R all data for affected analyte(s) if %R <80% or >120%.			X	
3) Spot check ICV/ICCS results for several analytes.			X	
Continuing Calibration Verification Standard (CCV) for ICP (6010) and Calibration Check Standard (CCS) for Hg (7470/7471) included in Lab Package?			X	N/A for Limited Validation
1) Analyzed immediately after each ICV/ICC/CB and after every 10 samples? If no, reject (R) data.			X	
2) CCS and CCV from independent source and at mid-level of calibration curve. If no, reject (R) data.			X	
3) %R criteria met? (90-110%R). If no, J positive results for affected analyte(s) if %R between 80-89% and 111-120% and indicate bias; UJ non-detect results for affected analyte(s) if %R between 80-89% and R all data for affected analyte(s) if %R <80% or >120%.			X	
4) Spot check CCV/CCS results for several analytes.			X	
Low Calibration Standard (CRI) included in Lab Package?			X	N/A for Limited Validation
1) %R criteria met? - 50-150% for Co, Mn, Zn, by ICP-MS; Pb, Tl by 6010; 70-130% all others. If no, refer to ILM05.4 NJ SOP 5.A.2 for actions.			X	

ITEM	YES	NO	N/A	COMMENTS
Calibration Blanks			X	N/A for Limited Validation
1) Analyzed after daily calibration and after each ICV/ICC/CCV/CCS and after every 10 samples? If no, reject (R) data.			X	
2) Absolute value <3xIDL? If no, -if sample result <10x CB result, qualify affected analyte(s) in associated samples with CB; -if sample result >10xCB result, no qualification.			X	
Method Blank Included in Lab Package?	X			
1) Method blank analyzed with each preparation batch or every SDG, or 1/20 samples? If no, reject (R) data, except no aqueous MB required for FB/EB if only soil samples were analyzed.	X			
2) Method blank analyzed 1/20 samples? If - MB 1/25, J sample results from 21-25; -MB >1/25, R sample results after 25th sample.	X			
3) MB results nondetect? If no, -sample result <3xMB, negate UB; -sample result>3xMB but <10xMB, JB; -sample result >10xMB, no qualification.		X		MP87141 (soil) Sb (0.48 mg/kg); qualify as nondetect (U) at RL JB96576-8A See nonconformance table
4) Negative MB result reported? If yes, -Positive sample result<10xMB, qualify estimated, biased low (J); -Non-detect sample result, qualify UJ, may be false non-detect.		X		
Field Blanks/Equipment Blanks Included in Lab Package?	X			FB-20150609
1) FB/EB result non-detect? If no, -sample result <3xFB/EB, negate U; -sample result>3xFB/EB but <10xMB, J; -sample result >10xFB/EB, no qualification.	X			
Interference Check Standards (ICSA and ICSB) included in Lab Package?	X			
1) Analyzed at beginning of analytical run? If no, reject (R) data.	X			
2) %R criteria met? (80-120%) If no, %R>120%, no qualification if sample result non-detect; %R between 121-150%, J positive results, biased high; %R between 50-79%, J/UJ results, biased low; %R<50% or >150%, reject (R) result	X			
3) Spot check accuracy of %Rs	X			

ITEM	YES	NO	N/A	COMMENTS
Matrix Spike/Matrix Spike Duplicate Data Included in Lab Package?	X			
1) MS/MSD %R (75-125%R) and RPD (+20% aq or 35% soils for SR \geq 5xRL or absolute difference <RL for SR<5xRL) criteria met? - %R>125% J positive results for affected analyte(s) for all samples in the same batch, accept NDs; -%R<75% J/UJ for affected analyte(s) for all samples in the same batch; - RPD outside limits J positive results for affected analyte(s) for all samples in the same batch/SDG, accept NDs. If absolute difference >RL for SR<5xRL estimate positive results and nondetects for affected analyte(s) for all samples in the same batch. For Hg same as above except Abs Diff between MS and MSD must be \leq 2xRL.		X		JB96576-8A Sb (MS 74.4%); qualify all soils (J-/UJ) See nonconformance table
2) Was a sample spiked at the frequency of 1/batch or 20 samples?	X			
3) Was the MS performed on a site sample?	X			
4) Was the MS performed on a FB/EB or TB? If yes, J all sample data.		X		
Post Digestion Spike		X		
1) %R criteria met? (80-120%R) - %R>120% J positive results for affected analyte(s) for all samples in the same batch/SDG, accept NDs. - %R<80% J/UJ affected analyte(s) for all samples in the same batch.			X	
2) Was the spike performed on a FB/EB or TB? If yes, J all sample data.			X	
3) Was a sample spiked at the frequency of 1/batch or 20 samples?			X	
Laboratory Duplicate Data Included in Lab Package?	X			see MS/MSD
Aqueous - If RPD is >35% for SR \leq 5xRL estimate (J) results.- If absolute difference is >RL for SR <RL estimate (J) positive and nondetects (UJ).- For Hg – Aq \leq 20%,	X			
Soil -- If RPD is >50% for SR \leq 5xRL estimate (J) results.- If absolute difference is >RL for SR <RL estimate (J) positive and nondetects (UJ).- For Hg Soil/Sediment \leq 35%,	X			

ITEM	YES	NO	N/A	COMMENTS
Was a Laboratory Control Sample (LCS) Included in Lab Package?	X			
1) LCS %R criteria met? (80-120%R or within vendor limits). If no, J/UJ all affected analytes(s) for all samples in the same batch/SDG.	X			
2) Was an LCS analyzed at the frequency of 1/batch or 20 samples? If no, J/UJ affected analyte(s) for all samples in the same batch/SDG.	X			
Serial Dilution	X			
1) %D (<10%R) criteria met? - If analyte concentration >10xRL and %D >10% J positive results for affected analyte(s) for all samples in the same batch, accept NDs.	X			
2) Was the frequency 1/batch or 20 samples?	X			
3) Was a site sample used?	X			
4) Was a FB/EB or TB used? If yes, J all sample data.		X		
5) Spot check accuracy of %Ds.	X			
Field Duplicate Data included in Lab Package?	X			
Aqueous - If RPD is >30% for SR≤5xRL estimate (J) results.- If absolute difference is >RL for SR <RL estimate (J) positive and nondetects (UJ).-			X	
Soil -- If RPD is >50% for SR≤5xRL estimate (J) results.- If absolute difference is >RL for SR <RL estimate (J) positive and nondetects (UJ).-	X			
Percent Solids data included in Lab Package?	X			
1) %Solids criteria (Reg 2 criteria) met? (≥50%)	X			

Nonconformance Tables**Blanks**

Batch MP87141

Analyte	Result	3x	10x	Actions	Associated Samples
Soil Method Blank	mg/kg	mg/kg	mg/kg		
Antimony	0.48	1.44	4.8	Negate results <3X MB	FS15A-11.0-11.5

Matrix Spike/Matrix Spike Duplicate

Batch MP87141

Source: FS15A-11.0-11.5

Analyte	MS	MSD	RPD	Qualifications	Associated Samples	
	mg/kg	mg/kg	%			
Antimony	74.4	77.2	2.7	Qualify J/UJ, Estimate biased low	FS15A-2.0-2.5	FS15A-3.0-3.5
					FS15A-5.0-5.5	FS15A-5.0-5.5X
					FS15A-7.0-7.5	FS15A-9.0-9.5
					FS15A-11.0-11.5	

Data Validation Report

Project:	PPG Garfield Avenue – Forrest Street Additional Remedial Investigation (GARIS)	
Laboratory:	Accutest, Dayton, NJ	
Laboratory Job No.:	JB96704, JB96704A, and JB96704R	
Analysis/Method:	Hexavalent Chromium SW846 3060A/7196 Select Metals SW846 3050B/6010C	
Validation Level:	Full (Hexavalent Chromium) Limited (Antimony, Chromium, Nickel, Thallium, and Vanadium)	
Site Location/Address:	90 & 98 Forrest Street Jersey City, NJ	
AECOM Project No:	60279173.GA.RI.RPT.FOR	
Prepared by:	Justin Webster /AECOM	Completed on: 7/23/2015
Reviewed by:	Dion Lewis/AECOM	File Name: JB96704_A_R_2015_7_23_DV Report-F

Introduction

The data were reviewed in accordance with the FSP-QAPP and the following NJDEP guidance documents and validation Standard Operating Procedures (SOP):

- NJDEP Office of Data Quality SOP 5.A.10, Rev 3 (September 2009), SOP for Analytical Data Validation of Hexavalent Chromium - for USEPA SW-846 Method 3060A, and USEPA SW-846 Method 7196A;
- NJDEP Office of Data Quality SOP 5.A.16, Rev 1 (May 2002), Quality Assurance Data Validation of Analytical Deliverables for Inorganics (based on USEPA SW-846 Methods)
- Data Quality Assessment and Data Usability Evaluation Technical Guidance, version 1.0, April 2014;
- Data of Known Quality Protocols Technical Guidance, version 1.0, April 2014;

The results of quality control data analyzed with site samples were used to assess the overall reliability of the data. The following qualifiers were used to identify data quality issues

- U: Indicates the analyte was not detected in the sample above the sample reporting limit.
- J: Indicates the result was an estimated value; the associated numerical value was an approximate concentration of the analyte in the sample.

- UJ: Indicates the analyte was not detected above the reporting limit and the reporting limit was approximate.
- UB: The analyte concentration is less than or equal to three (3) times the concentration in the associated method/prep blank. The presence of the analyte in the sample is negated (UB) due to laboratory contamination.
- JB: The analyte concentration is greater than three (3) times, but less than or equal to ten (10) times the concentration in the associated method/prep blank. The presence of that analyte in the sample is considered "real". The concentration is quantitatively qualified (JB) due to method blank contamination.
- R: The sample result was rejected due to serious deficiencies; the presence or absence of the analyte could not be confirmed.
- RA: The sample result was rejected but is still considered usable.

Sample Information

The samples listed below were collected by AECOM on June 10, 2015 as part of the PPG Garfield Avenue – Forrest Street Additional Remedial Investigation (GARIS) sampling at 90 & 98 Forrest Street Jersey City, NJ. Only the samples and parameters listed below were validated.

Field ID	Laboratory ID	Matrix	Fraction
FB-20150610 (Field blank)	JB96704-1,1A	Aqueous	Hexavalent Chromium, Select Metals
FSI6A-2.0-2.5	JB96704-2,2A,2R	Soil	Hexavalent Chromium, Select Metals
FSI6A-2.0-2.5X (Field duplicate of FSI6A-2.0-2.5)	JB96704-3,3A,3R	Soil	Hexavalent Chromium, Select Metals
FSI6A-4.0-4.5	JB96704-4,4A,4R	Soil	Hexavalent Chromium, Select Metals
FSI6A-6.0-6.5	JB96704-5,5A,5R	Soil	Hexavalent Chromium, Select Metals

The samples were collected following the procedures detailed in the Forrest Street Additional Remedial Investigation Work Plan dated April 27, 2015.

General Comments

The data package was complete. Quality control (QC) issues identified during validation are discussed below. Refer to the Target Analyte Summary Hit(s) in Attachment A for a listing of all detected results, qualified results, and associated qualifications, where applicable. The nonconformances for each section discussed below are presented in Attachment B.

Hexavalent Chromium

MS Results

Soil

Sample FSI6A-6.0-6.5 (JB96704-5) was selected for the soil matrix spike (MS) analysis and was used for supporting data quality recommendations. The soluble and insoluble MS recoveries (%Rs) from the initial batch were 72.1% and 100.1%, respectively. The soluble MS did not meet quality control (QC) criteria of 75-125%R. The post digestion spike (PDS) recovery was 101%, which met the PDS criteria of 85-115%.

Due to low soluble MS %R, the MS and soil samples were reanalyzed using Method 7196A. The soluble and insoluble MS results from the reanalysis batch were 61.9% and 108.5%, respectively. Again the soluble MS did not meet QC criteria of 75-125%R. The PDS %R was 108%, which met the PDS criteria of 85-115%.

Since the soluble MSs failed to meet QC criteria, additional parameters were analyzed to determine if possible matrix interferences could be the cause for the poor MS %Rs. All the soil samples were tested for pH and oxidation reduction potential (ORP), and plotted on an Eh/pH phase diagram. From this chart, the source sample for the MS analysis of sample FSI6A-6.0-6.5 (JB96704-5) was plotted slightly below the phase change line, indicating reducing potential within the sample matrix, incapable of supporting hexavalent chromium. Analyses for ferrous iron, sulfide screen, and total organic carbon (TOC) were performed on the MS source sample to confirm the reducing potential within the sample matrix. The sulfide screen was reported as nondetect, indicating no reducing agents within the sample matrix; however, the ferrous iron (0.55%) and the TOC results (373 mg/Kg) were positive, indicating potential reducing agents within the sample matrix.

The soluble MS %Rs from the initial and reanalysis did not meet the MS QC requirements, but all MS %Rs were greater than 50%; therefore, the highest detected hexavalent chromium result was reported for each soil sample. The reported hexavalent chromium results in all the soil samples were qualified as estimated (J) due to the poor soluble MS %Rs.

Field Duplicate Results

Samples FSI6A-6.0-6.5 and FSI6A-6.0-6.5X were collected as the field duplicate (FD) pair in this SDG. Hexavalent chromium met the precision criteria of the absolute difference of less than the reporting limit (RL) for sample results $\leq 5 \times \text{RL}$.

Sample Results

The concentration of total chromium was compared to the concentration of hexavalent chromium to ensure that the total chromium concentration was greater than the hexavalent chromium concentration. No data were qualified on this basis.

Hexavalent chromium results (flagged B by the laboratory) that were less than the RL, but greater than or equal to the method detection limit (MDL) are approximate values and have been qualified as estimated (J).

TAL Metals

Method Blank

Negative instrument drift was detected for thallium in the MB associated with the aqueous field blank sample collected in SDG. The potential for falsely nondetect sample results exist for the thallium results in sample FB-201506010. Refer to Attachment B, Blanks nonconformance, and the Hits List for a listing of all negative blank results and the qualified aqueous data.

Matrix Spike/Matrix Spike Duplicate (MS/MSD)

Site sample FSI6A-6.0-6.5 (JB96704-5A) was used for the MS/MSD analysis in association with the soil samples collected in this SDG. The MS and MSD for antimony were recovered at levels less than 75% indicating possible matrix interferences and the potential for biased low sample results. All antimony soil sample results within this SDG were qualified (J/UJ) as estimated with the potential for low bias.

Field Duplicate Results

Samples FSI6A-2.0-2.5 and FSI6A-2.0-2.5X were collected as the field duplicate pair in this SDG. All precision QC requirements were met. No data qualifications were necessary on this behalf.

Sample Results

Metal results (flagged B by the laboratory) that were less than the RL, but greater than or equal to the MDL are approximate values and have been qualified as estimated (J).

Data Quality and Usability

In general, these data appear to be valid and may be used for decision-making purposes. No data were rejected. Qualified results are presented in Attachments A and B.

The hexavalent chromium soil results in this SDG are usable as estimated values with the potential for low bias due to low MS recoveries. A reducing potential was indicated by the ancillary parameters (Eh/pH phase diagram, ferrous iron, and total organic carbon) suggesting that the matrix for this sample was not capable of supporting hexavalent chromium. The highest detected hexavalent chromium result or the nondetect hexavalent chromium result with the lowest RL between the initial analysis and reanalysis was reported for the soil samples in this SDG.

Thallium result in sample FB-20150610 qualified due to negative blank contamination are usable as estimated values with potential low bias.

Antimony soil sample results qualified due to low MS/MSD recovery are usable as estimated values with low bias.

Sample results reported between the MDL and RL are usable as estimated values with an unknown directional bias.

ATTACHMENTS

Attachment A: Target Analyte Summary Hitlist(s)

Attachment B: Data Validation Report Form

Attachment A

Target Analyte Summary Hitlist(s)

Soil Target Analyte Summary Hit List Hexavalent Chromium

Site Name PPG Garfield Avenue – Forrest Street Additional Remedial Investigation (GARIS)
Sampling Date June 10, 2015
Lab Name/ID Accutest, Dayton, NJ
SDG No JB96704 and JB96704R
Sample Matrix Soil
Trip Blank ID NA
Field Blank ID FB-201506010

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
FSI6A-2.0-2.5	JB96704-2R	CHROMIUM (HEXAVALENT)	U	0.67	0.67	0.53	Qualify	18
FSI6A-2.0-2.5X	JB96704-3	CHROMIUM (HEXAVALENT)	U	0.37	0.37	0.54	Qualify	18,31
FSI6A-4.0-4.5	JB96704-4	CHROMIUM (HEXAVALENT)	U	0.49	0.49	0.51	Qualify	18,31
FSI6A-6.0-6.5	JB96704-5	CHROMIUM (HEXAVALENT)	U	0.47	0.47	0.48	Qualify	18,31

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

NJDEP Soil Hexavalent Chromium Laboratory Footnote

- The value reported is less than or equal to 3x the value in the preparation/reagent blank. It is the policy of NJDEP-DPFSR to negate the reported value due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
- The value reported is greater than three (3) times but less than ten (10) times the value in the preparation/reagent blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to the preparation/reagent blank contamination. The "B" qualifier alerts the end-user to the presence of this analyte in the preparation/reagent blank.
- The value reported is less than or equal to three (3) times the value in the trip/field blank. It is the policy of NJDEP-DPFSR to negate the reported value as due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
- The value reported is greater than three (3) times but less than ten (10) times the value in the trip/field blanks and is considered "real". However, the reported value must be quantitatively qualified "J" due to trip/field blank contamination.

5. The concentration reported by the laboratory is incorrectly calculated.
6. The laboratory failed to report the presence of the analyte in the sample.
7. The reported Hexavalent Chromium value was qualified because the Calibration Check Standard was not within the recovery range (90-110 percent).
8. In the Duplicate Sample Analysis, Hexavalent Chromium fell outside the control limits of ≤ 20 percent for sample results $> 4xRL$ or $+ RL$ for sample results $< 4xRL$. Therefore, the result was qualified.
9. This analyte was rejected because the laboratory performed the Duplicate Analysis on a field blank.
10. The reported value was qualified because the PVS recovery was greater than 115 percent.
11. The reported value was qualified because the PVS recovery was less than 85 percent.
12. The non-detected value was qualified (UJ) because the PVS recovery was less than 85 percent. The possibility of a false negative exists.
13. The reported analyte was qualified because the associated Calibration Blank result was greater than the MDL.
14. The laboratory made a transcription error. No hits were found in the raw data.
15. This analyte is rejected because the laboratory exceeded the holding time for digestion and analysis.
16. The laboratory subtracted the preparation/reagent blank from the sample result. The Reviewer's calculation puts the preparation/reagent blank back into the result.
17. The photocopy is unreadable. Therefore, the QA reviewer cannot read the laboratory's reported concentration result.
18. The reported value was qualified because the predigestion spike recovery was less than 75 %, but greater than 50%.
19. The reported value was qualified because the predigestion spike recovery was greater than 125 percent.
20. The non-detected value was qualified (UJ) because the predigestion and or redigestion spike recovery was less than 75 percent. The possibility of a false negative exists.

21. The reported result was qualified or rejected because the laboratory did not record the pH value(s) of the sample in a laboratory notebook.
22. The reported value was qualified (J/UJ) because the sample moisture content exceeded 50 percent.
23. The sample result was rejected because the soluble and insoluble matrix spike recoveries were less than 50%.
24. The detected sample result was qualified (J) because the incorrect spike concentration was used.
25. The reported sample results were rejected because the predigestion spike recovery was greater than 150 percent.
26. The reported sample results were rejected because the redigestion spike recovery was greater than 150 percent.
27. The reported value was qualified (J) because the redigestion spike recovery was less than 75 percent.
28. The reported value was qualified (J/UJ) because the sample digestion temperature was less than 90C.
29. In the Field Duplicate Sample Analysis, Hexavalent Chromium fell outside the control limits of < 50% for sample results > 5xRL.
30. The reported value was qualified as estimated (J/UJ) but the bias is uncertain due to both high and low MS recoveries.
31. The reported result was greater than the MDL but less than the RL and qualified (J) as estimated by the laboratory.
32. The reported value was qualified because the sample replicate precision criterion of < 20% for method 7199 was exceeded.
33. The reported value was qualified (J/UJ) because the laboratory control sample (LCS) recovery was less than 80%.
34. The reported value was qualified (J) because the laboratory control sample (LCS) recovery was greater than 120%.
35. The reported result was qualified because the matrix spike analysis was not performed at the proper frequency.
36. The reported result was qualified because the laboratory duplicate analysis was not performed at the proper frequency.
37. The result was qualified because the cooler temperature upon sample receipt exceeded 6°C.

Soil Target Analyte Summary Hit List (Metals)

Site Name PPG Garfield Avenue – Forrest Street Additional Remedial Investigation (GARIS)
Sampling Date June 10, 2015
Lab Name/ID Accutest, Dayton, NJ
SDG No JB96704A
Sample Matrix Soil
Trip Blank ID NA
Field Blank ID FB-201506010

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
FSI6A-2.0-2.5	JB96704-2A	ANTIMONY	U	U	U	2.0	Qualify	15
FSI6A-2.0-2.5	JB96704-2A	CHROMIUM	U	14.8	14.8	1.0		
FSI6A-2.0-2.5	JB96704-2A	NICKEL	U	13.9	13.9	4.0		
FSI6A-2.0-2.5	JB96704-2A	VANADIUM	U	19.1	19.1	5.0		
FSI6A-2.0-2.5X	JB96704-3A	ANTIMONY	U	U	U	2.0	Qualify	15
FSI6A-2.0-2.5X	JB96704-3A	CHROMIUM	U	16.0	16.0	0.99		
FSI6A-2.0-2.5X	JB96704-3A	NICKEL	U	14.4	14.4	3.9		
FSI6A-2.0-2.5X	JB96704-3A	VANADIUM	U	18.0	18.0	4.9		
FSI6A-4.0-4.5	JB96704-4A	ANTIMONY	U	U	U	2.0	Qualify	15
FSI6A-4.0-4.5	JB96704-4A	CHROMIUM	U	14.6	14.6	1.0		
FSI6A-4.0-4.5	JB96704-4A	NICKEL	U	16.4	16.4	4.1		
FSI6A-4.0-4.5	JB96704-4A	VANADIUM	U	19.7	19.7	5.1		
FSI6A-6.0-6.5	JB96704-5A	ANTIMONY	U	U	U	2.4	Qualify	15
FSI6A-6.0-6.5	JB96704-5A	CHROMIUM	U	15.9	15.9	1.2		
FSI6A-6.0-6.5	JB96704-5A	NICKEL	U	12.1	12.1	4.8		
FSI6A-6.0-6.5	JB96704-5A	VANADIUM	U	24.7	24.7	6.0		

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

NJDEP Soil Metals Laboratory Footnotes

1. The value reported is less than or equal to 3x the value in the method blank. It is the policy of NJDEP-DPFSR to negate the reported value due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
2. The value reported is greater than three (3) but less than ten (10) times the value in the method blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to the method blank contamination. The "B" qualifier alerts the end-user to the presence of this analyte in the method blank.
3. The value reported is less than or equal to 3x the value in the trip/field blank. It is the policy of NJDEP-DPFSR to negate the reported value as due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
4. The value reported is greater than 3x but less than ten (10) the value in the trip/field blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to trip/field blank contamination.
5. The concentration reported by the laboratory is incorrectly calculated.
6. The laboratory failed to report the presence of the analyte in the sample.
7. The reported metal value was qualified because the Calibration Verification Standard was not within the recovery range (90-110 percent).
8. In the MS/MSD Sample Analysis, this analyte fell outside the control limits of 20% RPD. Therefore, the result was qualified.
9. This analyte was qualified because the laboratory performed the MS/MSD Analysis on a field blank.
10. The reported analyte was qualified because the associated Calibration Blank result was greater than the MDL.
11. The reported value was qualified because serial dilution analysis was not within QC limit of 10% D.
12. This analyte is qualified or rejected because the laboratory exceeded the holding time for digestion and analysis.
13. The laboratory subtracted the method blank from the sample result. The reviewer's calculation has added the method blank result to the reported concentration.
14. The photocopy submitted is illegible. Therefore, the QA reviewer cannot read the laboratory's reported concentration result.

15. The reported or nondetected value was qualified because the MS/MSD spike recovery was less than 75 percent.
16. The reported value was qualified because the MS/MSD spike recovery was greater than 125 percent.
17. The reported value was qualified as estimated (J/UJ) but the bias is uncertain due to both high and low MS recoveries.
18. The reported values were qualified because the laboratory duplicate exceeded 35 percent RPD or the absolute difference exceeded the reporting limit for sample results < 5X the reporting limit.
19. The reported value was qualified because the field duplicate exceeded 50 percent RPD for results > 5X the reporting limit.
20. The reported value was qualified because the LCS recovery was less than 80 percent.
21. The reported value was qualified because the sample moisture content was greater than 50 percent.
22. The reported result was greater than the MDL but less than the RL and qualified (J) as estimated by the laboratory.
23. The reported value was qualified because the LCS recovery was greater than 120 percent.
24. The reported value was qualified because of negative instrument drift.
25. The reported value was qualified as estimated (J/UJ) but the bias is uncertain due to either an acceptable MS recovery and high or low MSD recovery, or acceptable MSD recovery and a high or low MS recovery.
26. The reported calculated value was negated since one or both of the values in the calculation were negated.

Aqueous Target Analyte Summary Hit List (Metals)

Site Name PPG Garfield Avenue – Forrest Street Additional Remedial Investigation (GARIS)
Sampling Date June 10, 2015
Lab Name/ID Accutest, Dayton, NJ
SDG No JB96704A
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID FB-201506010

Field Sample ID	Lab Sample ID	Analyte	Method Blank (µg/L)	Laboratory Sample Result (µg/L)	Validation Sample Result (µg/L)	RL (µg/L)	Quality Assurance Decision	NJDEP Validation Footnote
FB-20150610	JB96704-1A	THALLIUM	-1.8	U	UJ	2.0	Qualify	23

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

Aqueous Metals NJDEP Laboratory Footnotes

1. The value reported is less than or equal to 3x the value in the method blank. It is the policy of NJDEP-DPFSR to negate the reported value due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
2. The value reported is greater than three (3) but less than ten (10) times the value in the method blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to the method blank contamination. The "B" qualifier alerts the end-user to the presence of this analyte in the method blank.
3. The value reported is less than or equal to 3x the value in the trip/field blank. It is the policy of NJDEP-DPFSR to negate the reported value as due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
4. The value reported is greater than 3x but less than ten (10) the value in the trip/field blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to trip/field blank contamination.
5. The concentration reported by the laboratory is incorrectly calculated.

6. The laboratory failed to report the presence of the analyte in the sample.
7. The reported metal value was qualified because the Calibration Verification Standard was not within the recovery range (90-110 percent).
8. In the MS/MSD Sample Analysis, this analyte fell outside the control limits of 20% RPD. Therefore, the result was qualified.
9. This analyte was qualified because the laboratory performed the MS/MSD Analysis on a field blank.
10. The reported analyte was qualified because the associated Calibration Blank result was greater than the MDL.
11. The reported value was qualified because serial dilution analysis was not within QC limit of 10% D.
12. This analyte is rejected or qualified because the laboratory exceeded the holding time for digestion and analysis.
13. The laboratory subtracted the method blank from the sample result. The reviewer's calculation has added the method blank result to the reported concentration.
14. The photocopy submitted is illegible. Therefore, the QA reviewer cannot read the laboratory's reported concentration result.
15. The reported or nondetected value was qualified because the MS/MSD spike recovery was less than 75 percent for metals or less than 90% for wet chem.
16. The reported value was qualified because the MS/MSD spike recovery was greater than 125 percent for metals or greater than 110% for wet chem.
17. The reported value was qualified as estimated (J/UJ) but the bias is uncertain due to both high and low MS recoveries.
18. The reported values were qualified because the laboratory duplicate exceeded 20 percent RPD or the absolute difference exceeded the reporting limit for sample results < 5X the reporting limit.
19. The reported value was qualified because the field duplicate exceeded 30 percent RPD for results > 5X the reporting limit.
20. The reported value was qualified because the LCS recovery was less than 80 percent.
21. The reported result was greater than the MDL but less than the RL and qualified (J) as estimated by the laboratory.

22. The reported value was qualified because the LCS recovery was greater than 120 percent.
23. The reported value was qualified because of negative instrument drift.

Attachment B

Data Validation Report Form

Client Name: PPG Industries	Project Number: 60314351.GA.DE.PDI.P3
Site Location: PPG Garfield Avenue – Forrest Street Additional Remedial Investigation (GARIS)	Project Manager: Bill Spronz
Laboratory: Accutest, Dayton, NJ	Type of Validation: Full
Laboratory Job No: JB96704_R	Date Checked: 7/23/2015
Validator: Justin Webster	Peer: Dion Lewis

ITEM	YES	NO	N/A	COMMENTS
Sample results included?	X			
Reporting Limits met project requirements?	X			
Field I.D. included?	X			
Laboratory I.D. included?	X			
Sample matrix included?	X			
Sample receipt temperature 2-6°C?	X			
Signed COCs included?	X			
Date of sample collection included?	X			
Date of sample digestion included?	X			
Holding time to digestion met criteria? (Soils -30 days from collection to digestion.)	X			
Date of analysis included?	X			
Holding time to analysis met criteria? (Soils -168 hours from digestion to analysis; Aqueous - 24 hours from collection to analysis.)	X			
Method reference included?	X			
Laboratory Case Narrative included?	X			

Definitions: MDL Method Detection Limit; %R Percent Recovery; RL Reporting Limit; RPD Relative Percent Difference; RSD Relative Standard Deviation :Corr Correlation Coefficient.

ITEM	YES	NO	N/A	COMMENTS
Initial calibration documentation included in lab package?	X			
1) Blank plus 4 standards (7196A) or blank plus 3 standards (7199)	X			
2) Correlation coefficient of =0.995 (7196A) or =0.999 (7199)	X			
3) Calibrate daily or each time instrument is set up.	X			
Calibration Check Standard (CCS) for 7196A and Quality Control Sample (QCS) for 7199 Included in Lab Package?	X			
1) %R criteria met? (90 - 110%)	X			
2) Correct frequency of one per every 10 samples	X			
3) CCS and QCS from independent source and at mid-level of calibration curve	X			
Calibration Blanks	X			
1) Analyzed prior to initial calibration standards and after each CCS/QCS?	X			
2) Absolute value should not exceed MDL.	X			
Method Blank, Field Blanks and/or Equipment Blanks Included in Lab Package?	X			
1) Method blank analyzed with each preparation batch?	X			
2) Absolute value should not exceed MDL.	X			
Eh and pH Data	X			
1) Eh and pH data was included and plotted for all samples?	X			
Soluble Matrix Spike Data Included in Lab Package?	X			
1) Soluble Matrix %R criteria met? (75-125%R).		X		See nonconformance table
2) Was the spike concentration 40 mg/Kg or twice the sample concentration?	X			
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	X			
Insoluble Matrix Spike Data Included in Lab Package?	X			
1) Insoluble Matrix %R criteria met? (75-125%R).	X			
2) Was the spike concentration around 400 to 800 mg/Kg?		X		Insoluble spike concentrations were 1213 mg/kg and 845 mg/kg. Since insoluble MS meet recovery criteria no actions were taken.
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	X			

ITEM	YES	NO	N/A	COMMENTS
Post Digestion Spike	X			
1) Post Digestion Spike %R criteria met? (85-115%R).	X			
2) Was the spike concentration 40 mg/Kg or twice the sample concentration?	X			
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	X			
Sample Duplicate Data Included in Lab Package?	X			
1) RPD criteria met? (RPD ≤ 20%) if both results are ≤4x RL or absolute difference ≤ RL if either or both results are <4xRL	X			
2) Was a sample duplicate analyzed at the frequency of 1 per batch or 20 samples?	X			
Was a Laboratory Control Sample (LCS) Included in Lab Package?	X			
1) %R criteria met? (80-120%R).	X			
2) Was an LCS analyzed at the frequency of 1/batch or 20 samples?	X			
Were any Field Duplicate samples submitted with this SDG?	X			JB96704-2/3
1) Were Field duplicate RPD criteria met? (RPD≤50% for both sample results >5xRL or professional judgement if either or both results are <5xRL.	X			
Were all sample quantitation and reporting requirements met?	X			
1) Were all solid samples reported with percent solids > 50%?	X			
2) Were any samples analyzed or reported with dilutions?	X			
Miscellaneous Items	X			
1) For soils by 7196A, was the pH within a range of 7.0-8.0?	X			
2) For soils by 7199, was the pH within a range of 9.0-9.5?			X	
3) For aqueous by 7196A, was the pH with a range of 1.5-2.5?	X			
4) For soils (3060A), was the digestion temperature 90-95C for at least 60 minutes?	X			
5) For 7199, was each sample injected twice and was the RPD =20?			X	

SDG#: JB96704/ Method 7196A

Batch: GN27488

Cr+6 ICAL 6/19/2015

Soil

(p. 46 of data pkg)

x - concentration	y - response
0	0
0.01	0.009
0.05	0.044
0.1	0.088
0.3	0.251
0.5	0.42
0.8	0.652
1	0.835

(p. 46 of data pkg)

AECOM Calculated Offset	0.0023	OK	Reported Offset	0.0023
AECOM Slope	0.8264	OK	Reported Slope	0.8264
AECOM Calculated r	0.99985	OK	Reported r	0.99985

LCS calculation

GP89920-B1 P.24,46

Background Absorbance	0
Total absorbance	0.792
Total absorbance - background	0.79200
Instrument Concentration	0.956
Sample weight (mg/kg)	0.0025
Final Volume (L)	0.1
Dilution Factor	1

AECOM Calculated LCS Result (mg/Kg)	38.2	OK	Reported Result (mg/Kg)	38.2
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%R = Found/True*100

GP89920-B1 P.24,46

True Value (mg/kg)	40
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AECOM Calculated %R	95.6	OK rounding	Reported %R	95.5
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MS calculation

GP89920-S1 P.26,46

Background reading	0.002
Total absorbance	0.608
Total absorbance - background	0.606
Instrument Concentration	0.731
Sample weight (mg/kg)	0.00255
Final Volume (L)	0.1
Percent solids	0.826
Dilution Factor	1

AECOM Calculated MS Result (mg/Kg)	34.7	OK	Reported Result (mg/Kg)	34.7
------------------------------------	------	----	-------------------------	------

%R = Found/True*100

GP89920-S1 P.26,46

True Value (mg/kg)	47.5
Native concentration (mg/Kg)	0.47

AECOM%R	72.0	OK rounding	Reported %R	72.1
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Percent Solids

P.27

FSI6A-6.0-6.5

Empty dish weight=	17.68
Wet weight=	24.46
Dry weight=	23.28

AECOM%solids =	82.6	OK	reported %solids=	82.6
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Reporting Limit		P.13	FSI6A-6.0-6.5
Low Standard	0.01		
Initial weight (mg/kg)	0.00244		
Final volume (L)	0.1		
Percent solids	0.826		
Dilution Factor	1		
Reporting Limit	0.50	OK rounding	Reported RL (mg/Kg)= 0.48

Sample Calculations		P.13,46	FSI6A-6.0-6.5
Background reading	0.001		
Total absorbance	0.011		
Total absorbance - background	0.01		
Instrument Response	0.009		
Sample weight (mg/kg)	0.00244		
Final Volume (L)	0.1		
Percent solids	0.826		
Dilution Factor	1		
AECOM Calculated Result (mg/Kg)	0.47	OK	Reported Result (mg/Kg) 0.47

Nonconformance Tables**Matrix Spikes**

Sample ID	Lab ID	Analyte	Matrix Spike	% Recovery	Lower Limit	Upper Limit
FSI6A-6.0-6.5	JB96704-5	CHROMIUM (HEXAVALENT)	Soluble	72.1	75	125
FSI6A-6.0-6.5	JB96704-5R	CHROMIUM (HEXAVALENT)	Soluble	61.9	75	125

Client Name: PPG Industries				Project Number: 60279173.GA.RI.RPT.FOR	
Site Location: PPG Garfield Avenue – Forrest Street Additional Remedial Investigation (GARIS)				Project Manager: Bill Spronz	
Laboratory: Accutest, Dayton, NJ				Type of Validation: Limited	
Laboratory Job No: JB96704A				Date Checked: 7/23/2015	
Validator: Justin Webster				Peer: Dion Lewis	
ITEM	YES	NO	N/A	COMMENTS	
Sample results included?	X				
Reporting Limits met project requirements?	X				
Field I.D. included?	X				
Laboratory I.D. included?	X				
Sample matrix included?	X				
Sample receipt temperature 2-6C?	X				
Signed COCs included?	X				
Date of sample collection included?	X				
Date of sample digestion included?	X				
Date of analysis included?	X				
Holding time met QC criteria? (Aqueous – 28 days HCl to pH < 2, Cool, ≤ 6 °C)	X				
Method reference included?	X				
Laboratory Case Narrative included?	X				
Definitions: MDL - Method Detection Limit; %R - Percent Recovery; RL - Reporting Limit; RPD - Relative Percent Difference; RSD - Relative Standard Deviation :Corr - Correlation Coefficient.					

ITEM	YES	NO	N/A	COMMENTS
Sample dilutions?		X		
Initial calibration documentation included in lab package?			X	N/A for Limited Validation
1) Calibrate daily or each time instrument is set up.			X	
2) ICP (6010) -Blank plus 1 standard? If no, reject (R) data.			X	
3) Hg (7470/7471) -Blank plus 5 standards? If no, reject (R) data.			X	
Initial Calibration Verification Standard (ICV) for ICP (6010) and Initial Calibration Check Standard (ICCS) for Hg (7470/7471) included in lab package?			X	N/A for Limited Validation
1) Analyzed immediately after initial calibration? If no, reject (R) data.			X	
2) %R criteria met? (90-110%). If no, J positive results for affected analyte(s) if %R between 80-89% and 111-120% and indicate bias; UJ non-detect results for affected analyte(s) if %R between 80-89%, and R all data for affected analyte(s) if %R <80% or >120%.			X	
3) Spot check ICV/ICCS results for several analytes.			X	
Continuing Calibration Verification Standard (CCV) for ICP (6010) and Calibration Check Standard (CCS) for Hg (7470/7471) included in Lab Package?			X	N/A for Limited Validation
1) Analyzed immediately after each ICV/ICC/CB and after every 10 samples? If no, reject (R) data.			X	
2) CCS and CCV from independent source and at mid-level of calibration curve. If no, reject (R) data.			X	
3) %R criteria met? (90-110%R). If no, J positive results for affected analyte(s) if %R between 80-89% and 111-120% and indicate bias; UJ non-detect results for affected analyte(s) if %R between 80-89% and R all data for affected analyte(s) if %R <80% or >120%.			X	
4) Spot check CCV/CCS results for several analytes.			X	
Low Calibration Standard (CRI) included in Lab Package?			X	N/A for Limited Validation
1) %R criteria met? - 50-150% for Co, Mn, Zn, by ICP-MS; Pb, Tl by 6010; 70-130% all others. If no, refer to ILM05.4 NJ SOP 5.A.2 for actions.			X	

ITEM	YES	NO	N/A	COMMENTS
Calibration Blanks			X	N/A for Limited Validation
1) Analyzed after daily calibration and after each ICV/ICC/CCV/CCS and after every 10 samples? If no, reject (R) data.			X	
2) Absolute value <3xIDL? If no, -if sample result <10x CB result, qualify affected analyte(s) in associated samples with CB; -if sample result >10xCB result, no qualification.			X	
Method Blank Included in Lab Package?	X			
1) Method blank analyzed with each preparation batch or every SDG, or 1/20 samples? If no, reject (R) data, except no aqueous MB required for FB/EB if only soil samples were analyzed.	X			
2) Method blank analyzed 1/20 samples? If - MB 1/25, J sample results from 21-25; -MB >1/25, R sample results after 25th sample.	X			
3) MB results nondetect? If no, -sample result <3xMB, negate UB; -sample result>3xMB but <10xMB, JB; -sample result >10xMB, no qualification.		X		See nonconformance table
4) Negative MB result reported? If yes, -Positive sample result<10xMB, qualify estimated, biased low (J); -Non-detect sample result, qualify UJ, may be false non-detect.	X			See nonconformance table
Field Blanks/Equipment Blanks Included in Lab Package?	X			
1) FB/EB result non-detect? If no, -sample result <3xFB/EB, negate U; -sample result>3xFB/EB but <10xMB, J; -sample result >10xFB/EB, no qualification.	X			
Interference Check Standards (ICSA and ICSB) included in Lab Package?	X			
1) Analyzed at beginning of analytical run? If no, reject (R) data.	X			
2) %R criteria met? (80-120%) If no, %R>120%, no qualification if sample result non-detect; %R between 121-150%, J positive results, biased high; %R between 50-79%, J/UJ results, biased low; %R<50% or >150%, reject (R) result	X			
3) Spot check accuracy of %Rs	X			

ITEM	YES	NO	N/A	COMMENTS
Matrix Spike/Matrix Spike Duplicate Data Included in Lab Package?	X			
1) MS/MSD %R (75-125%R) and RPD (+20% aq or 35% soils for SR \geq 5xRL or absolute difference \leq RL for SR $<$ 5xRL) criteria met? - %R $>$ 125% J positive results for affected analyte(s) for all samples in the same batch, accept NDs; -%R $<$ 75% J/UJ for affected analyte(s) for all samples in the same batch; - RPD outside limits J positive results for affected analyte(s) for all samples in the same batch/SDG, accept NDs. If absolute difference $>$ RL for SR $<$ 5xRL estimate positive results and nondetects for affected analyte(s) for all samples in the same batch. For Hg same as above except Abs Diff between MS and MSD must be \leq 2xRL.		X		See nonconformance table
2) Was a sample spiked at the frequency of 1/batch or 20 samples?	X			
3) Was the MS performed on a site sample?	X			FSI6A-6.0-6.5
4) Was the MS performed on a FB/EB or TB? If yes, J all sample data.		X		
Post Digestion Spike		X		
1) %R criteria met? (80-120%R) - %R $>$ 120% J positive results for affected analyte(s) for all samples in the same batch/SDG, accept NDs. - %R $<$ 80% J/UJ affected analyte(s) for all samples in the same batch.			X	
2) Was the spike performed on a FB/EB or TB? If yes, J all sample data.			X	
3) Was a sample spiked at the frequency of 1/batch or 20 samples?			X	
Laboratory Duplicate Data Included in Lab Package?	X			MS/MSD
Aqueous - If RPD is $>$ 35% for SR \leq 5xRL estimate (J) results.- If absolute difference is $>$ RL for SR $<$ RL estimate (J) positive and nondetects (UJ).- For Hg – Aq \leq 20%,	X			
Soil -- If RPD is $>$ 50% for SR \leq 5xRL estimate (J) results.- If absolute difference is $>$ RL for SR $<$ RL estimate (J) positive and nondetects (UJ).- For Hg Soil/Sediment \leq 35%,	X			

ITEM	YES	NO	N/A	COMMENTS
Was a Laboratory Control Sample (LCS) Included in Lab Package?	X			
1) LCS %R criteria met? (80-120%R or within vendor limits). If no, J/UJ all affected analytes(s) for all samples in the same batch/SDG.	X			
2) Was an LCS analyzed at the frequency of 1/batch or 20 samples? If no, J/UJ affected analyte(s) for all samples in the same batch/SDG.	X			
Serial Dilution	X			
1) %D (<10%R) criteria met? - If analyte concentration >50xIDL and %D >10% J positive results for affected analyte(s) for all samples in the same batch, accept NDs.	X			
2) Was the frequency 1/batch or 20 samples?	X			
3) Was a site sample used?	X			
4) Was a FB/EB or TB used? If yes, J all sample data.		X		
5) Spot check accuracy of %Ds.	X			
Field Duplicate Data included in Lab Package?	X			
Aqueous - If RPD is >30% for SR≤5xRL estimate (J) results.- If absolute difference is >RL for SR <RL estimate (J) positive and nondetects (UJ).-			X	
Soil -- If RPD is >50% for SR≤5xRL estimate (J) results.- If absolute difference is >RL for SR <RL estimate (J) positive and nondetects (UJ).-	X			See nonconformance table
Percent Solids data included in Lab Package?	X			
1) %Solids criteria (Reg 2 criteria) met? (≥50%)	X			

Nonconformance Tables

Blanks

Batch MP87091

Analyte	Result	3x	10x	Actions	Associated Samples
Aqueous Method Blank	mg/kg	ug/l	ug/l		
Thallium	-1.8	-5.4	-18	(UJ) nondetects and (J) results < 10x negative blank concentration	FB-20150610
Vanadium	0.7	2.1	7	None, report result ND	

Matrix Spike/Matrix Spike Duplicate

Batch MP7035

Analyte	MS	MSD	RPD	Actions	Associated Samples
	%	%			
Antimony	43.0	45.1	4.7	Estimate bias low	All soils collected in this SDG

Field Duplicate

Analyte	FSI6A-2.0-2.5 mg/kg	RL mg/kg	FSI6A-2.0-2.5X mg/kg	RL mg/kg	RPD (%)	Actions	Associated Samples
Antimony	2.0 U	2.0	2.0 U	2.0	NC	None	All soils collected in this SDG
Chromium	14.8	1.0	16.0	0.99	7.8%	None	
Nickel	13.9	4.0	14.4	3.9	3.5%	None	
Thallium	1.0 U	1.0	0.99 U	0.99	NC	None	
Vanadium	19.1	5.0	18.0	4.9	5.9%	None	

Note:

NC - Not Calculated

Data Validation Report

Project:	PPG Garfield Avenue – Forrest Street Additional Remedial Investigation (GARIS)		
Laboratory:	Accutest, Dayton, NJ		
Laboratory Job No.:	JB96995, JB96995R, JB96995A, and JB96995T		
Analysis/Method:	Hexavalent Chromium SW846 3060A/7196 Select Metals SW846 3050B/6010C		
Validation Level:	Full (Hexavalent Chromium) Limited (Antimony, Chromium, Nickel, Thallium, Vanadium)		
Site Location/Address:	90 & 98 Forrest Street Jersey City, NJ		
AECOM Project No:	60279173.GA.RI.RPT.FOR		
Prepared by:	Dion Lewis/AECOM	Completed on: 7/30/2015	
Reviewed by:	Justin Webster/AECOM	File Name: JB96995_A_R_T_2015_7_24_DV Report-F	

Introduction

The data were reviewed in accordance with the FSP-QAPP and the following NJDEP guidance documents and validation Standard Operating Procedures (SOP):

- NJDEP Office of Data Quality SOP 5.A.10, Rev 3 (September 2009), SOP for Analytical Data Validation of Hexavalent Chromium - for USEPA SW-846 Method 3060A, and USEPA SW-846 Method 7196A;
- NJDEP Office of Data Quality SOP 5.A.16, Rev 1 (May 2002), Quality Assurance Data Validation of Analytical Deliverables for Inorganics (based on USEPA SW-846 Methods)
- Data Quality Assessment and Data Usability Evaluation Technical Guidance, version 1.0, April 2014;
- Data of Known Quality Protocols Technical Guidance, version 1.0, April 2014;

The results of quality control data analyzed with site samples were used to assess the overall reliability of the data. The following qualifiers were used to identify data quality issues

- U: Indicates the analyte was not detected in the sample above the sample reporting limit.
- J: Indicates the result was an estimated value; the associated numerical value was an approximate concentration of the analyte in the sample.

- UJ: Indicates the analyte was not detected above the reporting limit and the reporting limit was approximate.
- UB: The analyte concentration is less than or equal to three (3) times the concentration in the associated method/prep blank. The presence of the analyte in the sample is negated (UB) due to laboratory contamination.
- JB: The analyte concentration is greater than three (3) times, but less than or equal to ten (10) times the concentration in the associated method/prep blank. The presence of that analyte in the sample is considered "real". The concentration is quantitatively qualified (JB) due to method blank contamination.
- R: The sample result was rejected due to serious deficiencies; the presence or absence of the analyte could not be confirmed.
- RA: The sample result was rejected but is still considered usable.

Sample Information

The samples listed below were collected by AECOM on June 13, 2015 as part of the PPG Garfield Avenue – Forrest Street Additional Remedial Investigation (GARIS) sampling at 90 & 98 Forrest Street Jersey City, NJ. Only the samples and parameters listed below were validated.

Field ID	Laboratory ID	Matrix	Fraction
FB-20150613 (Equipment Blank)	JB96995-8	Aqueous	Hexavalent Chromium and Metals
FB-20150613 (Equipment Blank)	JB96995-8A	Aqueous	Hexavalent Chromium and Metals
FSI4A-0.5-1.0	JB96995-1	Soil	Hexavalent Chromium
FSI4A-0.5-1.0	JB96995-1A	Soil	Metals
FSI4A-0.5-1.0	JB96995-1R	Soil	Hexavalent Chromium
FSI4A-2.0-2.5	JB96995-5	Soil	Hexavalent Chromium
FSI4A-2.0-2.5	JB96995-5A	Soil	Metals
FSI4A-2.0-2.5	JB96995-5R	Soil	Hexavalent Chromium
FSI4A-4.0-4.5	JB96995-4	Soil	Hexavalent Chromium
FSI4A-4.0-4.5	JB96995-4A	Soil	Metals
FSI4A-4.0-4.5	JB96995-4R	Soil	Hexavalent Chromium
FSI4A-6.0-6.5	JB96995-2	Soil	Hexavalent Chromium
FSI4A-6.0-6.5	JB96995-2A	Soil	Metals
FSI4A-6.0-6.5	JB96995-2R	Soil	Hexavalent Chromium
FSI4A-6.0-6.5X (Field duplicate of FSI4A-6.0-6.5)	JB96995-3	Soil	Hexavalent Chromium
FSI4A-6.0-6.5X (Field duplicate of FSI4A-6.0-6.5)	JB96995-3A	Soil	Metals
FSI4A-6.0-6.5X (Field duplicate of FSI4A-6.0-6.5)	JB96995-3R	Soil	Hexavalent Chromium
FSI4A-8.0-8.5	JB96995-6	Soil	Hexavalent Chromium
FSI4A-8.0-8.5	JB96995-6A	Soil	Metals
FSI4A-8.0-8.5	JB96995-6R	Soil	Hexavalent Chromium
FSI4A-8.5-9.0	JB96995-7T	Soil	Hexavalent Chromium

Field ID	Laboratory ID	Matrix	Fraction
FSI4A-8.5-9.0	JB96995-7T	Soil	Metals

The samples were collected following the procedures detailed in the Forrest Street Additional Remedial Investigation Work Plan dated April 27, 2015.

General Comments

The data package was complete. Quality control (QC) issues identified during validation are discussed below. Refer to the Target Analyte Summary Hit(s) in Attachment A for a listing of all detected results, qualified results, and associated qualifications, where applicable. The nonconformances for each section discussed below are presented in Attachment B.

Hexavalent Chromium

Matrix Spike Results

There were two matrix spike (MS) samples associated with the samples collected in this SDG used to support data quality recommendations: Sample FSI4A-8.0-8.5, associated with the first set of samples prepared and analyzed, and sample FSI4A-8.5-9.0, which was initially placed on hold and later scheduled for analysis (i.e., batch size of one).

MS Sample FSI4A-8.0-8.5

For the MS performed on sample FSI4A-8.0-8.5 (JB96995-6), the soluble and insoluble MS recoveries (%Rs) from the initial batch were 41.1% and 98.6%, respectively. The soluble MS did not meet quality control (QC) criteria of 75-125%R and was less than 50%. The post digestion spike (PDS) recovery was 101%, which met the PDS criteria of 85-115%.

Due to low soluble MS %R, the MS and soil samples were reanalyzed using Method 7196A. The soluble and insoluble MS results from the reanalysis batch were 3.6% and 104.3%, respectively. Again the soluble MS did not meet QC criteria of 75-125%R and was less than 50%. The PDS %R was 91.8, which met the PDS criteria of 85-115%.

Since the soluble MSs failed to meet QC criteria, additional parameters were analyzed to determine if possible matrix interferences could be the cause for the poor MS %Rs. All of the soil samples were tested for pH and oxidation reduction potential (ORP), and plotted on an Eh/pH phase diagram. From this chart, the source sample for the MS analysis of sample FSI4A-8.0-8.5 (JB96995-6) was plotted above the phase change line, indicating oxidizing potential within the sample matrix, capable of supporting hexavalent chromium. Analyses for ferrous iron, sulfide screen, and total organic carbon (TOC) were performed on the MS source sample to confirm the oxidizing potential within the sample matrix. The sulfide screen was reported as nondetect, indicating no reducing agents within the sample matrix; however, the ferrous iron (0.38%) and the TOC results (1,020 mg/Kg) were positive, indicating potential reducing agents within the sample matrix.

Since the soluble MS recoveries from the initial and reanalysis did not meet the MS QC requirements, but the insoluble MS recoveries did, the highest detected hexavalent chromium result or the nondetect hexavalent chromium result with the lowest reporting limit (RL) was reported for each soil sample. The reported hexavalent chromium results in all the soil samples were qualified as estimated (J/UJ) due to the poor soluble MS %Rs.

MS Sample FSI4A-8.5-9.0

For the MS on sample FSI4A-8.5-9.0 (JB96995-7T), the soluble and insoluble MS recoveries (%Rs) from the initial batch were 86.8% and 102.5%, respectively, which met the QC criteria of 75-125%R. The PDS recovery was 104%, which met the PDS criteria of 85-115%. No data qualification of sample FSI4A-8.5-9.0 was required on the basis of MS recoveries.

Laboratory Duplicate Precision

There were two samples in this SDG used for supporting laboratory precision quality recommendations: Sample FSI4A-8.0-8.5, associated with the first set of samples prepared and analyzed, and sample FSI4A-8.5-9.0, which was initially placed on hold and later scheduled for analysis.

The precision associated with the first sample set met the relative percent difference (RPD) QC criteria of less than or equal to 20 percent; the precision associated with sample FSI4A-8.5-9.0 did not. Therefore, the hexavalent chromium result for sample FSI4A-8.5-9.0 was qualified as estimated (J).

Field Duplicate Results

Samples FSI4A-6.0-6.5 and FSI4A-6.0-6.5X were collected as the field duplicate (FD) pair in this SDG. The RPD for the reported hexavalent chromium field duplicate results exceeded the QC acceptance RPD; therefore, the reported hexavalent chromium results in all of the soil samples in this SDG were qualified as estimated (J/UJ).

Holding Time

The holding time for aqueous hexavalent chromium analysis of less than 24 hours from collection was exceeded by 22 hours. Therefore, the hexavalent chromium result for sample FB-20150613 was qualified (UJ), as estimated nondetect, with the potential for low bias.

Sample Results

The concentration of total chromium was compared to the concentration of hexavalent chromium to ensure that the total chromium concentration was greater than the hexavalent chromium concentration. No data were qualified on this basis.

Hexavalent chromium results (flagged B by the laboratory) that were less than the RL, but greater than or equal to the method detection limit (MDL) are approximate values and have been qualified as estimated (J).

Select Metals

Matrix Spike/Matrix Spike Duplicate (MS/MSD)

There were two MS samples associated with the samples collected in this SDG; one was used to support data quality recommendations: Sample FSI4A-8.0-8.5, associated with the first set of samples prepared and analyzed, and a non project specific sample (JB99297-1) prepared with sample FSI4A-8.5-9.0, which was initially placed on hold and later scheduled for analysis (i.e., with a batch size of one). Since sample FSI4A-8.5-9.0 was not prepared with a project specific QC sample, spike results associated with FSI4A-8.0-8.5 were applied to this sample as well.

MS Sample FS14A-8.0-8.5

For the MS on sample FS14A-8.0-8.5 (JB96995-6A), the MS and MSD for antimony were recovered at levels less than 75% indicating possible matrix interferences and the potential for biased low sample results. The MS for chromium was recovered at 144% indicating possible matrix interferences and the potential for biased high sample results. All antimony and chromium soil sample results within this SDG were qualified (J/UJ) as estimated with the potential for bias (antimony low bias, chromium high bias).

Field Duplicate Results

The RPD for the reported total chromium field duplicate results exceeded the QC acceptance RPD of less than or equal to 50 percent; therefore, the reported total chromium results in the soil samples collected in this SDG were qualified as estimated (J/UJ).

The RPD precision associated with the remaining metals analyzed (Sb, Ni, Tl, and V) met the QC acceptance RPD of less than or equal to 50 percent.

Sample Results

Antimony result (flagged B by the laboratory) that was less than the RL, but greater than or equal to the MDL is an approximate value and has been qualified as estimated (J).

Data Quality and Usability

In general, these data appear to be valid and may be used for decision-making purposes. No data were rejected. Qualified results are presented in Attachments A and B.

With one exception (JB96995-7T with acceptable MS recoveries), the hexavalent chromium soil results associated with in this SDG are usable as estimated values with the potential for low bias due to low MS recoveries. A reducing potential was indicated by select ancillary parameters (ferrous iron and total organic carbon) suggesting that the matrix for this sample may not be capable of supporting hexavalent chromium. The highest detected hexavalent chromium result or the nondetect hexavalent chromium result with the lowest RL between the initial analysis and reanalysis was reported for the associated soil samples.

The hexavalent chromium result for sample FS14A-8.8-9.0 was qualified due to poor laboratory duplicate precision and is usable as an estimated value with an unknown directional bias.

Hexavalent chromium and total chromium results qualified due to poor field duplicate precision are usable as estimated values with an unknown directional bias.

The hexavalent chromium result for sample FB-20150613 was qualified due to holding time exceedance and is usable as an estimated value with the potential for low bias.

All antimony results are usable as estimated values with the potential for low bias due to low MS recoveries. All total chromium results are useable as estimated values with a potential for high bias due to high MS recovery.

Sample results reported between the MDL and RL are usable as estimated values with an unknown directional bias.

ATTACHMENTS

Attachment A: Target Analyte Summary Hitlist(s)

Attachment B: Data Validation Report Form

Attachment A

Target Analyte Summary Hitlist(s)

Soil Target Analyte Summary Hit List Hexavalent Chromium

Site Name PPG Garfield Avenue – Forrest Street Additional Remedial Investigation (GARIS)
Sampling Date June 13, 2015
Lab Name/ID Accutest, Dayton, NJ
SDG No JB96995 and JB96995R
Sample Matrix Soil
Trip Blank ID NA
Field Blank ID FB-20150613

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
FSI4A-0.5-1.0	JB96995-1	CHROMIUM (HEXAVALENT)	U	0.30B	0.30	0.47	Qualify	18, 29,31
FSI4A-2.0-2.5	JB96995-5	CHROMIUM (HEXAVALENT)	U	0.69	0.69	0.48	Qualify	18, 29
FSI4A-8.0-8.5	JB96995-6	CHROMIUM (HEXAVALENT)	U	54.5	54.5	0.97	Qualify	18, 29
FSI4A-8.5-9.0	JB96995-7T	CHROMIUM (HEXAVALENT)	U	15.0	15.0	0.46	Qualify	8, 29
FSI4A-4.0-4.5	JB96995-4R	CHROMIUM (HEXAVALENT)	U	0.58	0.58	0.48	Qualify	18, 29
FSI4A-6.0-6.5	JB96995-2R	CHROMIUM (HEXAVALENT)	U	1.5	1.5	0.49	Qualify	18, 29
FSI4A-6.0-6.5X	JB96995-3R	CHROMIUM (HEXAVALENT)	U	0.63	0.63	0.51	Qualify	18, 29

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

NJDEP Soil Hexavalent Chromium Laboratory Footnote

1. The value reported is less than or equal to 3x the value in the preparation/reagent blank. It is the policy of NJDEP-DPFSR to negate the reported value due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
2. The value reported is greater than three (3) times but less than ten (10) times the value in the preparation/reagent blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to the preparation/reagent blank contamination. The "B" qualifier alerts the end-user to the presence of this analyte in the preparation/reagent blank.
3. The value reported is less than or equal to three (3) times the value in the trip/field blank. It is the policy of NJDEP-DPFSR to negate the reported value as due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.

4. The value reported is greater than three (3) times but less than ten (10) times the value in the trip/field blanks and is considered "real". However, the reported value must be quantitatively qualified "J" due to trip/field blank contamination.
5. The concentration reported by the laboratory is incorrectly calculated.
6. The laboratory failed to report the presence of the analyte in the sample.
7. The reported Hexavalent Chromium value was qualified because the Calibration Check Standard was not within the recovery range (90-110 percent).
8. In the Duplicate Sample Analysis, Hexavalent Chromium fell outside the control limits of ≤ 20 percent for sample results $> 4xRL$ or $+ RL$ for sample results $< 4xRL$. Therefore, the result was qualified.
9. This analyte was rejected because the laboratory performed the Duplicate Analysis on a field blank.
10. The reported value was qualified because the PVS recovery was greater than 115 percent.
11. The reported value was qualified because the PVS recovery was less than 85 percent.
12. The non-detected value was qualified (UJ) because the PVS recovery was less than 85 percent. The possibility of a false negative exists.
13. The reported analyte was qualified because the associated Calibration Blank result was greater than the MDL.
14. The laboratory made a transcription error. No hits were found in the raw data.
15. This analyte is rejected because the laboratory exceeded the holding time for digestion and analysis.
16. The laboratory subtracted the preparation/reagent blank from the sample result. The Reviewer's calculation puts the preparation/reagent blank back into the result.
17. The photocopy is unreadable. Therefore, the QA reviewer cannot read the laboratory's reported concentration result.
18. The reported value was qualified because the predigestion soluble and/or insoluble spike recovery was less than 75%; at least 1 MS recovery was $> 50\%$ between the initial and re-digested sample batch.

19. The reported value was qualified because the predigestion spike recovery was greater than 125 percent.
20. The non-detected value was qualified (UJ) because the predigestion and or redigestion spike recovery was less than 75 percent. The possibility of a false negative exists.
21. The reported result was qualified or rejected because the laboratory did not record the pH value(s) of the sample in a laboratory notebook.
22. The reported value was qualified (J/UJ) because the sample moisture content exceeded 50 percent.
23. The sample result was rejected because the soluble and insoluble matrix spike recoveries were less than 50%.
24. The detected sample result was qualified (J) because the incorrect spike concentration was used.
25. The reported sample results were rejected because the predigestion spike recovery was greater than 150 percent.
26. The reported sample results were rejected because the redigestion spike recovery was greater than 150 percent.
27. The reported value was qualified (J) because the redigestion spike recovery was less than 75 percent.
28. The reported value was qualified (J/UJ) because the sample digestion temperature was less than 90C.
29. In the Field Duplicate Sample Analysis, Hexavalent Chromium fell outside the control limits of < 50% for sample results > 5xRL.
30. The reported value was qualified as estimated (J/UJ) but the bias is uncertain due to both high and low MS recoveries.
31. The reported result was greater than the MDL but less than the RL and qualified (J) as estimated by the laboratory.
32. The reported value was qualified because the sample replicate precision criterion of < 20% for method 7199 was exceeded.
33. The reported value was qualified (J/UJ) because the laboratory control sample (LCS) recovery was less than 80%.
34. The reported value was qualified (J) because the laboratory control sample (LCS) recovery was greater than 120%.
35. The reported result was qualified because the matrix spike analysis was not performed at the proper frequency.

36. The reported result was qualified because the laboratory duplicate analysis was not performed at the proper frequency.

37. The result was qualified because the cooler temperature upon sample receipt exceeded 6°C.

Aqueous Target Analyte Summary Hit List Hexavalent Chromium

Site Name PPG Garfield Avenue – Forrest Street Additional Remedial Investigation (GARIS)
Sampling Date June 13, 2015
Lab Name/ID Accutest, Dayton, NJ
SDG No JB96995
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID FB-20150613

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
FB-20150613	JB96995-8	CHROMIUM (HEXAVALENT)	U	U	U	0.0031	Qualify	11

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

NJDEP Aqueous Hexavalent Chromium Laboratory Footnote

- The value reported is less than or equal to 3x the value in the preparation/reagent blank. It is the policy of NJDEP-DPFSR to negate the reported value due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
- The value reported is greater than three (3) times but less than ten (10) times the value in the preparation/reagent blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to the preparation/reagent blank contamination. The "B" qualifier alerts the end-user to the presence of this analyte in the preparation/reagent blank.
- The value reported is less than or equal to three (3) times the value in the trip/field blank. It is the policy of NJDEP-DPFSR to negate the reported value as due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
- The value reported is greater than three (3) times but less than ten (10) times the value in the trip/field blanks and is considered "real". However, the reported value must be quantitatively qualified "J" due to trip/field blank contamination.
- The concentration reported by the laboratory is incorrectly calculated.
- The laboratory failed to report the presence of the analyte in the sample.

7. The reported value was qualified because the Calibration Verification Standard was not within the recovery range (90-110 percent).
8. In the MS/MSD Sample Analysis, this analyte fell outside the control limits of 20% RPD. Therefore, the result was qualified.
9. This analyte was qualified because the laboratory performed the MS/MSD Analysis on a field blank.
10. The reported analyte was qualified because the associated Calibration Blank result was greater than the MDL.
11. This analyte is rejected or qualified because the laboratory exceeded the holding time for digestion and/or analysis.
12. The laboratory subtracted the method blank from the sample result. The reviewer's calculation has added the method blank result to the reported concentration.
13. The photocopy submitted is illegible. Therefore, the QA reviewer cannot read the laboratory's reported concentration result.
14. The reported or nondetected value was qualified because the MS/MSD spike recovery was less than 75 percent.
15. The reported value was qualified because the MS/MSD spike recovery was greater than 125 percent.
16. The reported value was qualified as estimated (J/UJ) but the bias is uncertain due to both high and low MS recoveries.
17. The reported values were qualified because the laboratory duplicate exceeded 20 percent RPD or the absolute difference exceeded the reporting limit for sample results < 4X the reporting limit.
18. The reported value(s) was qualified as estimated (J) because the field duplicate RPD was >30% for SR<5xRL, or the absolute difference was >RL for SR <RL, in which case the reported value(s) were estimated (J) positive and nondetects (UJ).
19. The reported value was qualified because the LCS recovery was less than 80 percent.
20. The reported result was greater than the MDL but less than the RL and qualified (J) as estimated by the laboratory.
21. The reported value was qualified because the LCS recovery was greater than 120 percent.
22. The reported value was qualified because of negative instrument drift.

23. The dissolved result was > the total result and the relative percent difference between the total and dissolved results fell outside the control limits of < 20% for sample results > 4xRL or absolute difference of +/- RL for sample results < 4xRL. Therefore, the results in both the total and dissolved fractions were qualified.
24. The dissolved hexavalent chromium result was > the dissolved chromium result or the total hexavalent chromium result was > the total chromium result and the relative percent difference between the total and dissolved results fell outside the control limits of < 20% for sample results > 4xRL or absolute difference of +/- RL for sample results < 4xRL. Therefore, the results were qualified.

Soil Target Analyte Summary Hit List (Metals)

Site Name PPG Garfield Avenue – Forrest Street Additional Remedial Investigation (GARIS)
Sampling Date June 13, 2015
Lab Name/ID Accutest, Dayton, NJ
SDG No JB96995A and JB96995T
Sample Matrix Soil
Trip Blank ID NA
Field Blank ID FB-20150613

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
FSI4A-0.5-1.0	JB96995-1A	ANTIMONY	U	0.50B	0.50	2.3	Qualify	15,22
FSI4A-0.5-1.0	JB96995-1A	CHROMIUM	U	20.6	20.6	1.2	Qualify	19,16
FSI4A-6.0-6.5	JB96995-2A	CHROMIUM	U	59.4	59.4	1.2	Qualify	19,16
FSI4A-6.0-6.5X	JB96995-3A	CHROMIUM	U	25.7	25.7	0.98	Qualify	19,16
FSI4A-4.0-4.5	JB96995-4A	CHROMIUM	U	18.0	18.0	1.2	Qualify	19,16
FSI4A-2.0-2.5	JB96995-5A	CHROMIUM	U	17.5	17.5	1.2	Qualify	19,16
FSI4A-8.0-8.5	JB96995-6A	CHROMIUM	U	370	370	1.3	Qualify	19,16
FSI4A-8.5-9.0	JB96995-7T	CHROMIUM	U	133	133	1.1	Qualify	19,16
FSI4A-0.5-1.0	JB96995-1A	NICKEL	U	28.9	28.9	4.7	-	-
FSI4A-6.0-6.5	JB96995-2A	NICKEL	U	12.1	12.1	4.8	-	-
FSI4A-6.0-6.5X	JB96995-3A	NICKEL	U	17.6	17.6	3.9	-	-
FSI4A-4.0-4.5	JB96995-4A	NICKEL	U	12.7	12.7	4.7	-	-
FSI4A-2.0-2.5	JB96995-5A	NICKEL	U	15.6	15.6	4.8	-	-
FSI4A-8.0-8.5	JB96995-6A	NICKEL	U	15.3	15.3	5.1	-	-
FSI4A-8.5-9.0	JB96995-7T	NICKEL	U	12.2	12.2	4.4	-	-
FSI4A-0.5-1.0	JB96995-1A	VANADIUM	U	30.2	30.2	5.9	-	-
FSI4A-6.0-6.5	JB96995-2A	VANADIUM	U	31.1	31.1	5.9	-	-
FSI4A-6.0-6.5X	JB96995-3A	VANADIUM	U	24.6	24.6	4.9	-	-
FSI4A-4.0-4.5	JB96995-4A	VANADIUM	U	15.7	15.7	5.9	-	-
FSI4A-2.0-2.5	JB96995-5A	VANADIUM	U	23.0	23.0	6.1	-	-
FSI4A-8.0-8.5	JB96995-6A	VANADIUM	U	38.6	38.6	6.3	-	-
FSI4A-8.5-9.0	JB96995-7T	VANADIUM	U	23.9	23.9	5.5	-	-

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

NJDEP Soil Metals Laboratory Footnotes

1. The value reported is less than or equal to 3x the value in the method blank. It is the policy of NJDEP-DPFSR to negate the reported value due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
2. The value reported is greater than three (3) but less than ten (10) times the value in the method blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to the method blank contamination. The "B" qualifier alerts the end-user to the presence of this analyte in the method blank.
3. The value reported is less than or equal to 3x the value in the trip/field blank. It is the policy of NJDEP-DPFSR to negate the reported value as due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
4. The value reported is greater than 3x but less than ten (10) the value in the trip/field blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to trip/field blank contamination.
5. The concentration reported by the laboratory is incorrectly calculated.
6. The laboratory failed to report the presence of the analyte in the sample.
7. The reported metal value was qualified because the Calibration Verification Standard was not within the recovery range (90-110 percent).
8. In the MS/MSD Sample Analysis, this analyte fell outside the control limits of 20% RPD. Therefore, the result was qualified.
9. This analyte was qualified because the laboratory performed the MS/MSD Analysis on a field blank.
10. The reported analyte was qualified because the associated Calibration Blank result was greater than the MDL.
11. The reported value was qualified because serial dilution analysis was not within QC limit of 10% D.
12. This analyte is qualified or rejected because the laboratory exceeded the holding time for digestion and analysis.
13. The laboratory subtracted the method blank from the sample result. The reviewer's calculation has added the method blank result to the reported concentration.

14. The photocopy submitted is illegible. Therefore, the QA reviewer cannot read the laboratory's reported concentration result.
15. The reported or nondetected value was qualified because the MS/MSD spike recovery was less than 75 percent.
16. The reported value was qualified because the MS/MSD spike recovery was greater than 125 percent.
17. The reported value was qualified as estimated (J/UJ) but the bias is uncertain due to both high and low MS recoveries.
18. The reported values were qualified because the laboratory duplicate exceeded 35 percent RPD or the absolute difference exceeded the reporting limit for sample results < 5X the reporting limit.
19. The reported value was qualified because the field duplicate exceeded 50 percent RPD for results > 5X the reporting limit.
20. The reported value was qualified because the LCS recovery was less than 80 percent.
21. The reported value was qualified because the sample moisture content was greater than 50 percent.
22. The reported result was greater than the MDL but less than the RL and qualified (J) as estimated by the laboratory.
23. The reported value was qualified because the LCS recovery was greater than 120 percent.
24. The reported value was qualified because of negative instrument drift.
25. The reported value was qualified as estimated (J/UJ) but the bias is uncertain due to either an acceptable MS recovery and high or low MSD recovery, or acceptable MSD recovery and a high or low MS recovery.
26. The reported calculated value was negated since one or both of the values in the calculation were negated.

Attachment B

Data Validation Report Form

Client Name: PPG Industries	Project Number: 60279173.GA.RI.RPT.FOR
Site Location: PPG Garfield Avenue – Forrest Street Additional Remedial Investigation (GARIS)	Project Manager: Bill Spronz
Laboratory: Accutest, Dayton, NJ	Type of Validation: Full
Laboratory Job No: JB96995_R_A_T	Date Checked: 7/30/2015
Validator: Dion Lewis	Peer: Justin Webster

ITEM	YES	NO	N/A	COMMENTS
Sample results included?	X			
Reporting Limits met project requirements?	X			
Field I.D. included?	X			
Laboratory I.D. included?	X			
Sample matrix included?	X			
Sample receipt temperature 2-6°C?	X			
Signed COCs included?	X			Initial relinquish time not recorded; No action taken on these rapid TAT samples
Date of sample collection included?	X			
Date of sample digestion included?	X			
Holding time to digestion met criteria? (Soils -30 days from collection to digestion.)	X			Soils OK; Equipment Blank > 24 but < 48 hours (J qualified)
Date of analysis included?	X			
Holding time to analysis met criteria? (Soils -168 hours from digestion to analysis; Aqueous - 24 hours from collection to analysis.)	X			
Method reference included?	X			
Laboratory Case Narrative included?	X			

Definitions: MDL Method Detection Limit; %R Percent Recovery; RL Reporting Limit; RPD Relative Percent Difference; RSD Relative Standard Deviation :Corr Correlation Coefficient.

ITEM	YES	NO	N/A	COMMENTS
Initial calibration documentation included in lab package?	X			
1) Blank plus 4 standards (7196A) or blank plus 3 standards (7199)	X			
2) Correlation coefficient of =0.995 (7196A) or =0.999 (7199)	X			
3) Calibrate daily or each time instrument is set up.	X			
Calibration Check Standard (CCS) for 7196A and Quality Control Sample (QCS) for 7199 Included in Lab Package?	X			
1) %R criteria met? (90 - 110%)	X			
2) Correct frequency of one per every 10 samples	X			
3) CCS and QCS from independent source and at mid-level of calibration curve	X			
Calibration Blanks	X			
1) Analyzed prior to initial calibration standards and after each CCS/QCS?	X			
2) Absolute value should not exceed MDL.	X			
Method Blank, Field Blanks and/or Equipment Blanks Included in Lab Package?	X			
1) Method blank analyzed with each preparation batch?	X			
2) Absolute value should not exceed MDL.	X			
Eh and pH Data	X			
1) Eh and pH data was included and plotted for all samples?	X			
Soluble Matrix Spike Data Included in Lab Package?	X			
1) Soluble Matrix %R criteria met? (75-125%R).		X		See nonconformance table
2) Was the spike concentration 40 mg/Kg or twice the sample concentration?	X			
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	X			
Insoluble Matrix Spike Data Included in Lab Package?	X			
1) Insoluble Matrix %R criteria met? (75-125%R).	X			
2) Was the spike concentration around 400 to 800 mg/Kg?	X			
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	X			

ITEM	YES	NO	N/A	COMMENTS
Post Digestion Spike	X			
1) Post Digestion Spike %R criteria met? (85-115%R).	X			
2) Was the spike concentration 40 mg/Kg or twice the sample concentration?	X			
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	X			
Sample Duplicate Data Included in Lab Package?	X			
1) RPD criteria met? (RPD ≤ 20%) if both results are ≤4x RL or absolute difference ≤ RL if either or both results are <4xRL		X		JB96995 batch OK; JB96995T RPD Criteria Exceeded
2) Was a sample duplicate analyzed at the frequency of 1 per batch or 20 samples?	X			
Was a Laboratory Control Sample (LCS) Included in Lab Package?	X			
1) %R criteria met? (80-120%R).	X			
2) Was an LCS analyzed at the frequency of 1/batch or 20 samples?	X			
Were any Field Duplicate samples submitted with this SDG?	X			JB96995-2/3
1) Were Field duplicate RPD criteria met? (RPD≤50% for both sample results >5xRL or professional judgement if either or both results are <5xRL.		X		See nonconformance table
Were all sample quantitation and reporting requirements met?	X			
1) Were all solid samples reported with percent solids > 50%?	X			
2) Were any samples analyzed or reported with dilutions?	X			JB96995-6 DF: 2
Miscellaneous Items	X			
1) For soils by 7196A, was the pH within a range of 7.0-8.0?	X			
2) For soils by 7199, was the pH within a range of 9.0-9.5?			X	
3) For aqueous by 7196A, was the pH with a range of 1.5-2.5?	X			
4) For soils (3060A), was the digestion temperature 90-95C for at least 60 minutes?	X			
5) For 7199, was each sample injected twice and was the RPD =20?			X	

SDG#: JB96955, Method 7196

Batch: GP90345/GN28447

Cr+6 ICAL 6/25/2015

Soils

(p 49 of data pkg.)

x - concentration	y - response
0	0
0.01	0.01
0.05	0.043
0.1	0.091
0.3	0.255
0.5	0.416
0.8	0.666
1	0.824

(p 49 of data pkg.)

AECOM Calculated Intercept	0.0038	OK	Reported intercept	0.0038
AECOM Slope	0.8241	OK	Reported Slope	0.8241
AECOM Calculated r	0.99994	OK	Reported r	0.99994

LCS calculation

GP90345-B1 p 26, 49

Background absorbance 0
 Sample absorbance 0.75
 LCS Soluble Instrument Response 0.75
 Instrument Concentration (mg/L) 0.905
 Sample weight (kg) 0.0025
 Percent solids 1
 Dilution Factor 1

AECOM Calculated LCS Result (mg/kg)	36.2	OK	Reported Result (mg/kg)	36.2
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%R = Found/True*100

GP90345-B1 p 26, 49

True Value (mg/kg) 40.0

AECOM Calculated %R	90.5	OK	Reported %R	90.5
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MS calculation

GP90345-S1 p 13, 28, 29, 49, 52

JB96955-6

Background reading 0
 Total absorbance 0.635
 Total absorbance - background 0.635
 Instrument Concentration (mg/L) 0.7659
 Sample weight (kg) 0.00251
 Percent solids 0.823
 Dilution Factor 2

AECOM Calculated MS Result (mg/kg)	74.2	OK Rounding	Reported Result (mg/kg)	74.4
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%R = Found/True*100

GP90345-S1 p 13, 28, 29, 49, 52

JB96955-6

True Value (mg/kg) 48.4

Native concentration (mg/kg) 54.5

AECOM Calculated MS Result %R	40.6	OK Rounding	Reported %R	41.1
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Percent Solids

JB96955-6 p 29

Empty dish weight (g)= 21.16

Wet weight (g)= 29.95

Dry weight (g)= 28.39

AECOM %solids =	82.3	OK	Reported %solids=	82.3
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Reporting Limit

JB96955-6

p 13, 29, 49, 52

Low Standard	0.01		
Initial weight (kg)	0.00242		
Final volume (L)	0.1		
Percent solids	0.823		
Dilution Factor	2		
AECOM Calculated Reporting Limit	1.00	OK Rounding	Reported RL (mg/kg)= 0.97

Sample Calculations **JB96955-6** **p 13, 29, 49, 52**

Background reading	0		
Total absorbance	0.451		
Total absorbance - background	0.451		
Instrument Response (mg/L)	0.543		
Sample weight (kg)	0.00242		
Final Volume (L)	0.1		
Percent solids	0.823		
Dilution Factor	2		
AECOM Calculated Result (mg/kg)	54.5	OK	Reported Result (mg/kg) 54.5

Hexavalent Chromium Nonconformance Tables**Holding Times**

Sample ID	Sampling to Prep	Status	Days from Prep to Analysis	Status	Sampling to Analysis (Hours)	Status
FB-20150613	NA		NA		46	>24 hours but <48 (J)

Matrix Spikes

Sample ID	Analyte	Analysis Batch	Matrix Spike	% Recovery	Lower Limit	Upper Limit	PDS	PDS Limit
FSI4A-8.0-8.5	CHROMIUM (HEXAVALENT)	GP90078/GN27857	Soluble	41.1	75	125	101	85-115
FSI4A-8.0-8.5	CHROMIUM (HEXAVALENT)		Insoluble	98.6	75	125	-	-
FSI4A-8.0-8.5	CHROMIUM (HEXAVALENT)	GP90345/GN28447	Soluble	3.6	75	125	97.8	85-115
FSI4A-8.0-8.5	CHROMIUM (HEXAVALENT)		Insoluble	104.3	75	125	-	-

Lab Duplicates

Sample ID	Laboratory ID	Analyte	Sample Result	Qual	Duplicate Result	Qual	QL	Units	RPD
FSI4A-8.0-8.5	JB96995-6	CHROMIUM (HEXAVALENT)	54.5		54.1		0.97	mg/kg	0.7
FSI4A-8.0-8.5	JB96995-6R	CHROMIUM (HEXAVALENT)	43.7		42.9		0.49	mg/kg	1.8
FSI4A-8.5-9.0	JB96995-7T	CHROMIUM (HEXAVALENT)	15		19.4		0.46	mg/kg	25.6

Field Duplicates

Sample ID	Duplicate ID	Analyte	Sample Result	Qual	Duplicate Result	Qual	QL	Units	RPD
FSI4A-6.0-6.5	FSI4A-6.0-6.5X	CHROMIUM (HEXAVALENT)	0.67		0.52		0.51	mg/kg	Delta RL OK
FSI4A-6.0-6.5(R)	FSI4A-6.0-6.5X(R)	CHROMIUM (HEXAVALENT)	1.5		0.6		0.49	mg/kg	81.7

Client Name: PPG Industries				Project Number: 60279173.GA.RI.RPT.FOR	
Site Location: PPG Garfield Avenue – Forrest Street Additional Remedial Investigation (GARIS)				Project Manager: Bill Spronz	
Laboratory: Accutest, Dayton, NJ				Type of Validation: Limited	
Laboratory Job No: JB96995A and JB96995T				Date Checked: 7/30/2015	
Validator: Dion Lewis				Peer: Justin Webster	
ITEM	YES	NO	N/A	COMMENTS	
Sample results included?	X				
Reporting Limits met project requirements?	X				
Field I.D. included?	X				
Laboratory I.D. included?	X				
Sample matrix included?	X				
Sample receipt temperature 2-6C?	X				
Signed COCs included?	X			Initial relinquish time not recorded; No action taken on these rapid TAT samples	
Date of sample collection included?	X				
Date of sample digestion included?	X				
Date of analysis included?	X				
Holding time met QC criteria? (Aqueous – 28 days HCl to pH < 2, Cool, ≤ 6 °C)	X				
Method reference included?	X				
Laboratory Case Narrative included?	X				
Definitions: MDL - Method Detection Limit; %R - Percent Recovery; RL - Reporting Limit; RPD - Relative Percent Difference; RSD - Relative Standard Deviation ;Corr - Correlation Coefficient.					

ITEM	YES	NO	N/A	COMMENTS
Sample dilutions?		X		
Initial calibration documentation included in lab package?			X	N/A for Limited Validation
1) Calibrate daily or each time instrument is set up.			X	
2) ICP (6010) -Blank plus 1 standard? If no, reject (R) data.			X	
3) Hg (7470/7471) -Blank plus 5 standards? If no, reject (R) data.			X	
Initial Calibration Verification Standard (ICV) for ICP (6010) and Initial Calibration Check Standard (ICCS) for Hg (7470/7471) included in lab package?			X	N/A for Limited Validation
1) Analyzed immediately after initial calibration? If no, reject (R) data.			X	
2) %R criteria met? (90-110%). If no, J positive results for affected analyte(s) if %R between 80-89% and 111-120% and indicate bias; UJ non-detect results for affected analyte(s) if %R between 80-89%, and R all data for affected analyte(s) if %R <80% or >120%.			X	
3) Spot check ICV/ICCS results for several analytes.			X	
Continuing Calibration Verification Standard (CCV) for ICP (6010) and Calibration Check Standard (CCS) for Hg (7470/7471) included in Lab Package?			X	N/A for Limited Validation
1) Analyzed immediately after each ICV/ICC/CB and after every 10 samples? If no, reject (R) data.			X	
2) CCS and CCV from independent source and at mid-level of calibration curve. If no, reject (R) data.			X	
3) %R criteria met? (90-110%R). If no, J positive results for affected analyte(s) if %R between 80-89% and 111-120% and indicate bias; UJ non-detect results for affected analyte(s) if %R between 80-89% and R all data for affected analyte(s) if %R <80% or >120%.			X	
4) Spot check CCV/CCS results for several analytes.			X	
Low Calibration Standard (CRI) included in Lab Package?			X	N/A for Limited Validation
1) %R criteria met? - 50-150% for Co, Mn, Zn, by ICP-MS; Pb, Tl by 6010; 70-130% all others. If no, refer to ILM05.4 NJ SOP 5.A.2 for actions.			X	

ITEM	YES	NO	N/A	COMMENTS
Calibration Blanks			X	N/A for Limited Validation
1) Analyzed after daily calibration and after each ICV/ICC/CCV/CCS and after every 10 samples? If no, reject (R) data.			X	
2) Absolute value <3xIDL? If no, -if sample result <10x CB result, qualify affected analyte(s) in associated samples with CB; -if sample result >10xCB result, no qualification.			X	
Method Blank Included in Lab Package?	X			
1) Method blank analyzed with each preparation batch or every SDG, or 1/20 samples? If no, reject (R) data, except no aqueous MB required for FB/EB if only soil samples were analyzed.	X			
2) Method blank analyzed 1/20 samples? If - MB 1/25, J sample results from 21-25; -MB >1/25, R sample results after 25th sample.	X			
3) MB results nondetect? If no, -sample result <3xMB, negate UB; -sample result>3xMB but <10xMB, JB; -sample result >10xMB, no qualification.	X			
4) Negative MB result reported? If yes, -Positive sample result<10xMB, qualify estimated, biased low (J); -Non-detect sample result, qualify UJ, may be false non-detect.			X	
Field Blanks/Equipment Blanks Included in Lab Package?	X			
1) FB/EB result non-detect? If no, -sample result <3xFB/EB, negate U; -sample result>3xFB/EB but <10xMB, J; -sample result >10xFB/EB, no qualification.	X			
Interference Check Standards (ICSA and ICSB) included in Lab Package?	X			
1) Analyzed at beginning of analytical run? If no, reject (R) data.	X			
2) %R criteria met? (80-120%) If no, %R>120%, no qualification if sample result non-detect; %R between 121-150%, J positive results, biased high; %R between 50-79%, J/UJ results, biased low; %R<50% or >150%, reject (R) result	X			
3) Spot check accuracy of %Rs	X			

ITEM	YES	NO	N/A	COMMENTS
Matrix Spike/Matrix Spike Duplicate Data Included in Lab Package?	X			
1) MS/MSD %R (75-125%R) and RPD (+20% aq or 35% soils for SR>5xRL or absolute difference <RL for SR<5xRL) criteria met? - %R>125% J positive results for affected analyte(s) for all samples in the same batch, accept NDs; -%R<75% J/UJ for affected analyte(s) for all samples in the same batch; - RPD outside limits J positive results for affected analyte(s) for all samples in the same batch/SDG, accept NDs. If absolute difference >RL for SR<5xRL estimate positive results and nondetects for affected analyte(s) for all samples in the same batch. For Hg same as above except Abs Diff between MS and MSD must be ≤ 2xRL.		X		See nonconformance table (Sb, Cr)
2) Was a sample spiked at the frequency of 1/batch or 20 samples?	X			
3) Was the MS performed on a site sample?	X			FSI4A-8.0-8.5
4) Was the MS performed on a FB/EB or TB? If yes, J all sample data.		X		
Post Digestion Spike		X		
1) %R criteria met? (80-120%R) - %R>120% J positive results for affected analyte(s) for all samples in the same batch/SDG, accept NDs. - %R<80% J/UJ affected analyte(s) for all samples in the same batch.			X	
2) Was the spike performed on a FB/EB or TB? If yes, J all sample data.			X	
3) Was a sample spiked at the frequency of 1/batch or 20 samples?			X	
Laboratory Duplicate Data Included in Lab Package?	X			
Aqueous - If RPD is >35% for SR≤5xRL estimate (J) results.- If absolute difference is >RL for SR <RL estimate (J) positive and nondetects (UJ).- For Hg – Aq ≤ 20%,	X			
Soil -- If RPD is >50% for SR≤5xRL estimate (J) results.- If absolute difference is >RL for SR <RL estimate (J) positive and nondetects (UJ).- For Hg Soil/Sediment ≤ 35%,	X			

ITEM	YES	NO	N/A	COMMENTS
Was a Laboratory Control Sample (LCS) Included in Lab Package?	X			
1) LCS %R criteria met? (80-120%R or within vendor limits). If no, J/UJ all affected analytes(s) for all samples in the same batch/SDG.	X			
2) Was an LCS analyzed at the frequency of 1/batch or 20 samples? If no, J/UJ affected analyte(s) for all samples in the same batch/SDG.	X			
Serial Dilution	X			
1) %D (<10%R) criteria met? - If analyte concentration >50xIDL and %D >10% J positive results for affected analyte(s) for all samples in the same batch, accept NDs.	X			
2) Was the frequency 1/batch or 20 samples?	X			
3) Was a site sample used?	X			
4) Was a FB/EB or TB used? If yes, J all sample data.		X		
5) Spot check accuracy of %Ds.	X			
Field Duplicate Data included in Lab Package?	X			
Aqueous - If RPD is >30% for SR≤5xRL estimate (J) results.- If absolute difference is >RL for SR <RL estimate (J) positive and nondetects (UJ).-			X	
Soil -- If RPD is >50% for SR≤5xRL estimate (J) results.- If absolute difference is >RL for SR <RL estimate (J) positive and nondetects (UJ).-	X			See nonconformance table (Cr)
Percent Solids data included in Lab Package?	X			
1) %Solids criteria (Reg 2 criteria) met? (≥50%)	X			

Metals Nonconformance Tables**Matrix Spikes**

Sample ID	Analyte	Analysis Batch	Matrix Spike	% Recovery	Lower Limit	Upper Limit	RPD	RPD Limit
FSI4A-8.0-8.5	ANTIMONY	MP87272	MS	57.3	75	125	-	-
			MSD	46			21.9	35
FSI4A-8.0-8.5	CHROMIUM		MS	144			-	-
			MSD	115.7			10.1	35

Field Duplicate

Analyte	FSI4A-6.0-6.5 mg/kg	RL mg/kg	FSI4A-6.0-6.5X mg/kg	RL mg/kg	RPD (%)	Actions	Associated Samples
Antimony	0.37 U	2.4	0.30 U	2.0	NC	None	-
Chromium	59.4	1.2	25.7	0.98	79.2%	Qualify	All soils in this SDG
Nickel	12.1	4.8	17.6	3.9	37.0%	None	-
Thallium	0.23 U	1.2	0.19 U	0.98	NC	None	-
Vanadium	31.1	5.9	24.6	4.9	23.3%	None	-

Note:

NC - Not Calculated

Data Validation Report

Project:	PPG Garfield Avenue IRM - Forrest	
Laboratory:	Accutest, Dayton, NJ	
Laboratory Job No.:	JB97861 and JB97861A	
Analysis/Method:	Hexavalent Chromium SW846 3060A/7196 Chromium by ICP-AES/ SW846-6010	
Validation Level:	Hexavalent Chromium (Full) Chromium (Limited)	
Site Location/Address:	PPG 90 Forrest Street, Jersey City, NJ	
AECOM Project No:	60337923.GA.RA.IRM.2015	
Prepared by:	Dawn Brule /AECOM	Completed on: 07/08/2015
Reviewed by:	Lisa Krowitz /AECOM	File Name: JB97861_A_2015-07-08_DV Report-F

Introduction

The data were reviewed in accordance with the FSP-QAPP and the following NJDEP guidance documents and validation Standard Operating Procedures (SOP):

- NJDEP Office of Data Quality SOP 5.A.10, Rev 3 (September 2009), SOP for Analytical Data Validation of Hexavalent Chromium - for USEPA SW-846 Method 3060A, and USEPA SW-846 Method 7196A;
- NJDEP Office of Data Quality SOP 5.A.16, Rev 1 (May 2002), Quality Assurance Data Validation of Analytical Deliverables for Inorganics (based on USEPA SW-846 Methods)
- Data Quality Assessment and Data Usability Evaluation Technical Guidance, version 1.0, April 2014;
- Data of Known Quality Protocols Technical Guidance, version 1.0, April 2014;

The results of quality control data analyzed with site samples were used to assess the overall reliability of the data. The following qualifiers were used to identify data quality issues:

- U: Indicates the analyte was not detected in the sample above the sample reporting limit.
- J: Indicates the result was an estimated value; the associated numerical value was an approximate concentration of the analyte in the sample.
- UJ: Indicates the analyte was not detected above the reporting limit and the reporting limit was approximate.

- UB: The analyte concentration is less than or equal to three (3) times the concentration in the associated method/prep blank. The presence of the analyte in the sample is negated (UB) due to laboratory contamination.
- JB: The analyte concentration is greater than three (3) times, but less than or equal to ten (10) times the concentration in the associated method/prep blank. The presence of that analyte in the sample is considered "real". The concentration is quantitatively qualified (JB) due to method blank contamination.
- R: The sample result was rejected due to serious deficiencies; the presence or absence of the analyte could not be confirmed.
- RA: The sample result was rejected but is still considered usable.

Sample Information

The samples listed below were collected by AECOM on June 24, 2015 and June 25, 2015 as part of the PPG Garfield Avenue IRM - Forrest sampling at PPG 90 Forrest Street, Jersey City, NJ. Only the samples and parameters listed below were validated.

Field ID	Laboratory ID	Matrix	Fraction
90 FORREST-2015-Q2	JB97861-1	Solid	Hexavalent Chromium
90 FORREST-2015-Q2	JB97861-1A	Solid	Chromium
90-FB2015625 (Equipment Blank)	JB97861-2	Aqueous	Hexavalent Chromium
90-FB2015625 (Equipment Blank)	JB97861-2A	Aqueous	Chromium

The samples were collected following the procedures detailed in the Work Order for Garfield Avenue Remedial Action (GARA) at the PPG 90 Forrest Street, Jersey City, NJ and the Field Sampling Plan/Quality Assurance Project Plan for Non-Residential and Residential Chromium Sites Hudson County, New Jersey (December 2011).

General Comments

The data package was complete. Quality control (QC) issues identified during validation are discussed below. Refer to the Target Analyte Summary Hit(s) in Attachment A for a listing of all detected results, qualified results, and associated qualifications, where applicable. The nonconformances for each section discussed below are presented in Attachment B.

Hexavalent Chromium

Laboratory Blanks/Equipment Blanks

Negative drift for hexavalent chromium was detected in the continuing calibration blanks (CCB) at - 0.0018 mg/L, impacting the equipment blank in this SDG. The nondetect equipment blank result was qualified as estimated (UJ).

MS Results

Sample 90 FORREST-2015-Q2 (JB97861-1) was selected for the matrix spike (MS) analysis associated with the samples in this SDG and was used for supporting data quality recommendations. The soluble and insoluble MS recoveries were 113.1% and 97.3%, respectively; which met the quality control criteria of 75-125%. The post digestion spike (PDS) recovery was 106%, which met the PDS criteria of 85-115%. No data qualification was required on the basis of spike recoveries.

Chromium

Laboratory Blanks/Equipment Blanks

Chromium was detected in the method blank associated with the equipment blank in this SDG, at a concentration above the method detection limit (MDL), but below the reporting limit (RL). The positive result for chromium in the equipment blank was negated (U) at the RL based on method blank contamination.

Negative instrument drift for chromium was detected in the continuing calibration blanks (CCB) associated with the solid sample in this SDG. Since the result for chromium in the associated solid sample was greater than 10X the negative drift, no qualifications were required.

Data Quality and Usability

In general, these data appear to be valid and may be used for decision-making purposes. No data were rejected. Qualified results, if applicable, are presented in Attachments A and B.

The negated chromium result in the equipment blank is usable as a nondetect result at the RL.

The hexavalent chromium result in the equipment blank is usable as an estimated value with potential low bias due to negative instrument drift.

ATTACHMENTS

Attachment A: Target Analyte Summary Hitlist(s)

Attachment B: Data Validation Report Form

Attachment A

Target Analyte Summary Hitlist(s)

Solid Target Analyte Summary Hit List (Hexavalent Chromium)

Site Name PPG Garfield Avenue IRM - Forrest
Sampling Date June 24, 2015 and June 25, 2015
Lab Name/ID Accutest, Dayton, NJ
SDG No JB97861
Sample Matrix Solid
Trip Blank ID NA
Field Blank ID 90-FB2015625

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
90 FORREST-2015-Q2	JB97861-1	CHROMIUM (HEXAVALENT)	U	65.0	65.0	2.0		

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

NJDEP Laboratory Footnote

1. The value reported is less than or equal to 3x the value in the preparation/reagent blank. It is the policy of NJDEP-DPFSR to negate the reported value due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
2. The value reported is greater than three (3) times but less than ten (10) times the value in the preparation/reagent blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to the preparation/reagent blank contamination. The "B" qualifier alerts the end-user to the presence of this analyte in the preparation/reagent blank.
3. The value reported is less than or equal to three (3) times the value in the trip/field blank. It is the policy of NJDEP-DPFSR to negate the reported value as due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
4. The value reported is greater than three (3) times but less than ten (10) times the value in the trip/field blanks and is considered "real". However, the reported value must be quantitatively qualified "J" due to trip/field blank contamination.
5. The concentration reported by the laboratory is incorrectly calculated.

6. The laboratory failed to report the presence of the analyte in the sample.
7. The reported Hexavalent Chromium value was qualified because the Calibration Check Standard was not within the recovery range (90-110 percent).
8. In the Duplicate Sample Analysis, Hexavalent Chromium fell outside the control limits of ≤ 20 percent for sample results $> 4xRL$ or $+ RL$ for sample results $< 4xRL$. Therefore, the result was qualified.
9. This analyte was rejected because the laboratory performed the Duplicate Analysis on a field blank.
10. The reported value was qualified because the PVS recovery was greater than 115 percent.
11. The reported value was qualified because the PVS recovery was less than 85 percent.
12. The non-detected value was qualified (UJ) because the PVS recovery was less than 85 percent. The possibility of a false negative exists.
13. The reported analyte was qualified because the associated Calibration Blank result was greater than the MDL.
14. The laboratory made a transcription error. No hits were found in the raw data.
15. This analyte is rejected because the laboratory exceeded the holding time for digestion and analysis.
16. The laboratory subtracted the preparation/reagent blank from the sample result. The Reviewer's calculation puts the preparation/reagent blank back into the result.
17. The photocopy is unreadable. Therefore, the QA reviewer cannot read the laboratory's reported concentration result.
18. The reported value was qualified because the predigestion spike recovery was less than 75 %, but greater than 50%.
19. The reported value was qualified because the predigestion spike recovery was greater than 125 percent.
20. The non-detected value was qualified (UJ) because the predigestion and or redigestion spike recovery was less than 75 percent. The possibility of a false negative exists.
21. The reported result was qualified or rejected because the laboratory did not record the pH value(s) of the sample in a laboratory notebook.

22. The reported value was qualified (J/UJ) because the sample moisture content exceeded 50 percent.
23. The sample result was rejected because the soluble and insoluble matrix spike recoveries were less than 50%.
24. The detected sample result was qualified (J) because the incorrect spike concentration was used.
25. The reported sample results were rejected because the predigestion spike recovery was greater than 150 percent.
26. The reported sample results were rejected because the redigestion spike recovery was greater than 150 percent.
27. The reported value was qualified (J) because the redigestion spike recovery was less than 75 percent.
28. The reported value was qualified (J/UJ) because the sample digestion temperature was less than 90C.
29. In the Field Duplicate Sample Analysis, Hexavalent Chromium fell outside the control limits of $\leq 50\%$ for sample results $> 5xRL$ or $+ RL$ for sample results $< 5xRL$. Therefore, the result was qualified.
30. The reported value was qualified as estimated (J/UJ) but the bias is uncertain due to both high and low MS recoveries.
31. The reported result was greater than the MDL but less than the RL and qualified (J) as estimated by the laboratory.
32. The reported value was qualified because the sample replicate precision criterion of $< 20\%$ for method 7199 was exceeded.
33. The reported value was qualified (J/UJ) because the laboratory control sample (LCS) recovery was less than 80%.
34. The reported value was qualified (J) because the laboratory control sample (LCS) recovery was greater than 120%.
35. The reported result was qualified because the matrix spike analysis was not performed at the proper frequency.
36. The reported result was qualified because the laboratory duplicate analysis was not performed at the proper frequency.
37. The result was qualified because the cooler temperature upon sample receipt exceeded 6C.
38. The reported value was qualified because the redigestion spike recovery was greater than 125 percent.

39. The reported result was rejected because the laboratory failed to perform the reanalysis due to insufficient sample volume.
40. The reported results was qualified because the laboratory failed to analyze an ending CCB.
41. The reported result was qualified because the laboratory failed to make the proper method specific pH adjustment.
42. The reported result was rejected because the laboratory failed to reanalyze the MS and associated sample(s) due to failed MS recoveries.
43. The hexavalent chromium was greater than the total chromium result and the percent difference between the results fell outside the control limits of < 20% for sample results > 4xRL or the absolute difference was greater than +/- RL for sample results < 4xRL; therefore, the hexavalent chromium result was qualified as estimated.
- 44 The reported result was qualified as estimated due to negative instrument drift.

Aqueous Target Analyte Summary Hit List (Hexavalent Chromium)

Site Name PPG Garfield Avenue IRM - Forrest
Sampling Date June 24, 2015 and June 25, 2015
Lab Name/ID Accutest, Dayton, NJ
SDG No JB97861
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID 90-FB2015625

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/L)	Laboratory Sample Result (mg/L)	Validation Sample Result (mg/L)	RL (mg/L)	Quality Assurance Decision	NJDEP Validation Footnote
90-FB2015625	JB97861-2	CHROMIUM (HEXAVALENT)	U	U	U	0.010	Qualify	44

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

NJDEP Laboratory Footnote

1. The value reported is less than or equal to 3x the value in the preparation/reagent blank. It is the policy of NJDEP-DPFSR to negate the reported value due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
2. The value reported is greater than three (3) times but less than ten (10) times the value in the preparation/reagent blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to the preparation/reagent blank contamination. The "B" qualifier alerts the end-user to the presence of this analyte in the preparation/reagent blank.
3. The value reported is less than or equal to three (3) times the value in the trip/field blank. It is the policy of NJDEP-DPFSR to negate the reported value as due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
4. The value reported is greater than three (3) times but less than ten (10) times the value in the trip/field blanks and is considered "real". However, the reported value must be quantitatively qualified "J" due to trip/field blank contamination.
5. The concentration reported by the laboratory is incorrectly calculated.

6. The laboratory failed to report the presence of the analyte in the sample.
7. The reported Hexavalent Chromium value was qualified because the Calibration Check Standard was not within the recovery range (90-110 percent).
8. In the Duplicate Sample Analysis, Hexavalent Chromium fell outside the control limits of ≤ 20 percent for sample results $> 4xRL$ or $+ RL$ for sample results $< 4xRL$. Therefore, the result was qualified.
9. This analyte was rejected because the laboratory performed the Duplicate Analysis on a field blank.
10. The reported value was qualified because the PVS recovery was greater than 115 percent.
11. The reported value was qualified because the PVS recovery was less than 85 percent.
12. The non-detected value was qualified (UJ) because the PVS recovery was less than 85 percent. The possibility of a false negative exists.
13. The reported analyte was qualified because the associated Calibration Blank result was greater than the MDL.
14. The laboratory made a transcription error. No hits were found in the raw data.
15. This analyte is rejected because the laboratory exceeded the holding time for digestion and analysis.
16. The laboratory subtracted the preparation/reagent blank from the sample result. The Reviewer's calculation puts the preparation/reagent blank back into the result.
17. The photocopy is unreadable. Therefore, the QA reviewer cannot read the laboratory's reported concentration result.
18. The reported value was qualified because the predigestion spike recovery was less than 75 %, but greater than 50%.
19. The reported value was qualified because the predigestion spike recovery was greater than 125 percent.
20. The non-detected value was qualified (UJ) because the predigestion and or redigestion spike recovery was less than 75 percent. The possibility of a false negative exists.
21. The reported result was qualified or rejected because the laboratory did not record the pH value(s) of the sample in a laboratory notebook.

22. The reported value was qualified (J/UJ) because the sample moisture content exceeded 50 percent.
23. The sample result was rejected because the soluble and insoluble matrix spike recoveries were less than 50%.
24. The detected sample result was qualified (J) because the incorrect spike concentration was used.
25. The reported sample results were rejected because the predigestion spike recovery was greater than 150 percent.
26. The reported sample results were rejected because the redigestion spike recovery was greater than 150 percent.
27. The reported value was qualified (J) because the redigestion spike recovery was less than 75 percent.
28. The reported value was qualified (J/UJ) because the sample digestion temperature was less than 90C.
29. In the Field Duplicate Sample Analysis, Hexavalent Chromium fell outside the control limits of $\leq 30\%$ for sample results $> 5xRL$ or $+ RL$ for sample results $< 5xRL$. Therefore, the result was qualified.
30. The reported value was qualified as estimated (J/UJ) but the bias is uncertain due to both high and low MS recoveries.
31. The reported result was greater than the MDL but less than the RL and qualified (J) as estimated by the laboratory.
32. The reported value was qualified because the sample replicate precision criterion of $< 20\%$ for method 7199 was exceeded.
33. The reported value was qualified (J/UJ) because the laboratory control sample (LCS) recovery was less than 80%.
34. The reported value was qualified (J) because the laboratory control sample (LCS) recovery was greater than 120%.
35. The reported result was qualified because the matrix spike analysis was not performed at the proper frequency.
36. The reported result was qualified because the laboratory duplicate analysis was not performed at the proper frequency.
37. The result was qualified because the cooler temperature upon sample receipt exceeded 6C.
38. The reported value was qualified because the redigestion spike recovery was greater than 125 percent.

39. The reported result was rejected because the laboratory failed to perform the reanalysis due to insufficient sample volume.
40. The reported results was qualified because the laboratory failed to analyze an ending CCB.
41. The reported result was qualified because the laboratory failed to make the proper method specific pH adjustment.
42. The reported result was rejected because the laboratory failed to reanalyze the MS and associated sample(s) due to failed MS recoveries.
43. The hexavalent chromium was greater than the total chromium result and the percent difference between the results fell outside the control limits of < 20% for sample results > 4xRL or the absolute difference was greater than +/- RL for sample results < 4xRL; therefore, the hexavalent chromium result was qualified as estimated.
- 44 The reported result was qualified as estimated due to negative instrument drift.

Solid Target Analyte Summary Hit List (Chromium)

Site Name PPG Garfield Avenue IRM - Forrest
Sampling Date June 24, 2015 and June 25, 2015
Lab Name/ID Accutest, Dayton, NJ
SDG No JB97861A
Sample Matrix Solid
Trip Blank ID NA
Field Blank ID 90-FB2015625

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
90 FORREST-2015-Q2	JB97861-1A	CHROMIUM	U	192	192	1.1		

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

NJDEP Laboratory Footnote

1. The value reported is less than or equal to 3x the value in the method blank. It is the policy of NJDEP-DPFSR to negate the reported value due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
2. The value reported is greater than three (3) but less than ten (10) times the value in the method blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to the method blank contamination. The "B" qualifier alerts the end-user to the presence of this analyte in the method blank.
3. The value reported is less than or equal to 3x the value in the trip/field blank. It is the policy of NJDEP-DPFSR to negate the reported value as due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
4. The value reported is greater than 3x but less than ten (10) the value in the trip/field blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to trip/field blank contamination.
5. The concentration reported by the laboratory is incorrectly calculated.
6. The laboratory failed to report the presence of the analyte in the sample.

7. The reported metal value was qualified because the Calibration Verification Standard was not within the recovery range (90-110 percent).
8. In the MS/MSD Sample Analysis, this analyte fell outside the control limits of 20% RPD. Therefore, the result was qualified.
9. This analyte was qualified because the laboratory performed the MS/MSD Analysis on a field blank.
10. The reported analyte was qualified because the associated Calibration Blank result was greater than the MDL.
11. The reported value was qualified because serial dilution analysis was not within QC limit of 10% D.
12. This analyte is rejected because the laboratory exceeded the holding time for digestion and analysis.
13. The laboratory subtracted the method blank from the sample result. The reviewer's calculation has added the method blank result to the reported concentration.
14. The photocopy submitted is illegible. Therefore, the QA reviewer cannot read the laboratory's reported concentration result.
15. The reported or nondetected value was qualified because the MS/MSD spike recovery was less than 75 percent.
16. The reported value was qualified because the MS/MSD spike recovery was greater than 125 percent.
17. The reported value was qualified as estimated (J/UJ) but the bias is uncertain due to both high and low MS recoveries.
18. The reported values were qualified because the laboratory duplicate exceeded 35 percent RPD for results greater than 5X the reporting limit or the absolute difference exceeded two times the reporting limit for sample result less than 5 times the reporting limit.
19. The reported value was qualified because the field duplicate exceeded 50 percent RPD for results greater than 5X the reporting limit or the absolute difference exceeded two times the reporting limit for sample result less than 5 times the reporting limit.
20. The reported value was qualified because the LCS recovery was less than 80 percent.
21. The reported value was qualified because the sample moisture content was greater than 50 percent.
22. The reported result was greater than the MDL but less than the RL and qualified (J) as estimated by the laboratory.
23. The reported value was qualified because the LCS recovery was greater than 120 percent.

Aqueous Target Analyte Summary Hit List (Chromium)

Site Name PPG Garfield Avenue IRM - Forrest
Sampling Date June 24, 2015 and June 25, 2015
Lab Name/ID Accutest, Dayton, NJ
SDG No JB97861A
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID 90-FB2015625

Field Sample ID	Lab Sample ID	Analyte	Method Blank (ug/L)	Laboratory Sample Result (ug/L)	Validation Sample Result (ug/L)	RL (ug/L)	Quality Assurance Decision	NJDEP Validation Footnote
90-FB2015625	JB97861-2A	CHROMIUM	U	1.0B	U	1.0	Negate	1

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

NJDEP Laboratory Footnote

1. The value reported is less than or equal to 3x the value in the method blank. It is the policy of NJDEP-DPFSR to negate the reported value due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
2. The value reported is greater than three (3) but less than ten (10) times the value in the method blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to the method blank contamination. The "B" qualifier alerts the end-user to the presence of this analyte in the method blank.
3. The value reported is less than or equal to 3x the value in the trip/field blank. It is the policy of NJDEP-DPFSR to negate the reported value as due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
4. The value reported is greater than 3x but less than ten (10) the value in the trip/field blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to trip/field blank contamination.
5. The concentration reported by the laboratory is incorrectly calculated.
6. The laboratory failed to report the presence of the analyte in the sample.

7. The reported metal value was qualified because the Calibration Verification Standard was not within the recovery range (90-110 percent).
8. In the MS/MSD Sample Analysis, this analyte fell outside the control limits of 20% RPD. Therefore, the result was qualified.
9. This analyte was qualified because the laboratory performed the MS/MSD Analysis on a field blank.
10. The reported analyte was qualified because the associated Calibration Blank result was greater than the MDL.
11. The reported value was qualified because serial dilution analysis was not within QC limit of 10% D.
12. This analyte is rejected because the laboratory exceeded the holding time for digestion and analysis.
13. The laboratory subtracted the method blank from the sample result. The reviewer's calculation has added the method blank result to the reported concentration.
14. The photocopy submitted is illegible. Therefore, the QA reviewer cannot read the laboratory's reported concentration result.
15. The reported or nondetected value was qualified because the MS/MSD spike recovery was less than 75 percent.
16. The reported value was qualified because the MS/MSD spike recovery was greater than 125 percent.
17. The reported value was qualified as estimated (J/UJ) but the bias is uncertain due to both high and low MS recoveries.
18. The reported values were qualified because the laboratory duplicate exceeded 20 percent RPD for results greater than 5X the reporting limit or the absolute difference exceeded two times the reporting limit for sample result less than 5 times the reporting limit.
19. The reported value was qualified because the field duplicate exceeded 30 percent RPD for results greater than 5X the reporting limit or the absolute difference exceeded two times the reporting limit for sample result less than 5 times the reporting limit.
20. The reported value was qualified because the LCS recovery was less than 80 percent.
21. The reported value was qualified because the sample moisture content was greater than 50 percent.
22. The reported result was greater than the MDL but less than the RL and qualified (J) as estimated by the laboratory.
23. The reported value was qualified because the LCS recovery was greater than 120 percent.

Attachment B

Data Validation Report Form

Client Name: PPG Industries				Project Number: 60337923.GA.RA.IRM.2015			
Site Location: PPG Garfield Avenue IRM - Forrest, Jersey City, NJ				Project Manager: Scott Mikaelian			
Laboratory: Accutest, Dayton, NJ				Type of Validation: Full			
Laboratory Job No: JB97861				Date Checked: 7/8/2015			
Validator: Dawn Brule				Peer: Lisa Krowitz			
ITEM		YES	NO	N/A	COMMENTS		
Sample results included?		X					
Reporting Limits met project requirements?		X					
Field I.D. included?		X					
Laboratory I.D. included?		X					
Sample matrix included?		X					
Sample receipt temperature 2-6C?		X					
Signed COCs included?		X					
Date of sample collection included?		X					
Date of sample digestion included?		X					
Holding time to digestion met criteria? (Solids -30 days from collection to digestion.)		X					
Date of analysis included?		X					
Holding time to analysis met criteria? (Solids - 168 hours from digestion to analysis; Aqueous - 24 hours from collection to analysis.		X					
Method reference included?		X					
Laboratory Case Narrative included?		X					
Definitions: MDL - Method Detection Limit; %R - Percent Recovery; RL - Reporting Limit; RPD - Relative Percent Difference; RSD - Relative Standard Deviation :Corr - Correlation Coefficient.							

ITEM	YES	NO	N/A	COMMENTS
Initial calibration documentation included in lab package?	X			
1) Blank plus 4 standards (7196A) or blank plus 3 standards (7199)	X			
2) Correlation coefficient of =0.995 (7196A) or =0.999 (7199)	X			
3) Calibrate daily or each time instrument is set up.	X			
Calibration Check Standard (CCS) for 7196A and Quality Control Sample (QCS) for 7199 Included in Lab Package?	X			
1) %R criteria met? (90 - 110%)	X			
2) Correct frequency of one per every 10 samples	X			
3) CCS and QCS from independent source and at mid-level of calibration curve	X			
Calibration Blanks	X			
1) Analyzed prior to initial calibration standards and after each CCS/QCS?	X			
2) Absolute value should not exceed MDL.	X			
Method Blank, Field Blanks and/or Equipment Blanks Included in Lab Package?	X			
1) Method blank analyzed with each preparation batch?	X			
2) Absolute value should not exceed MDL.	X			
Eh and pH Data	X			
1) Eh and pH data was included and plotted for all samples?	X			
Soluble Matrix Spike Data Included in Lab Package?	X			
1) Soluble Matrix %R criteria met? (75-125%R).	X			
2) Was the spike concentration 40 mg/Kg or twice the sample concentration?	X			
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	X			
Insoluble Matrix Spike Data Included in Lab Package?	X			
1) Insoluble Matrix %R criteria met? (75-125%R).	X			
2) Was the spike concentration around 400 to 800 mg/Kg?		X		No impact to data.
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	X			

ITEM	YES	NO	N/A	COMMENTS
Post Digestion Spike	X			
1) Post Digestion Spike %R criteria met? (85-115%R).	X			
2) Was the spike concentration 40 mg/Kg or twice the sample concentration?	X			
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	X			
Sample Duplicate Data Included in Lab Package?	X			
1) RPD criteria met? (RPD \leq 20%) if both results are $>4x$ RL or absolute difference \leq RL if either or both results are $<4x$ RL.	X			
2) Was a sample duplicate analyzed at the frequency of 1 per batch or 20 samples?	X			
Was a Laboratory Control Sample (LCS) Included in Lab Package?	X			
1) %R criteria met? (80-120%R).	X			
2) Was an LCS analyzed at the frequency of 1/batch or 20 samples?	X			
Were any Field Duplicate samples submitted with this SDG?		X		
1) Were Field duplicate RPD criteria met? (RPD \leq 50% for both sample results $>4x$ RL or absolute difference \leq RL if either or both results are $<4x$ RL.			X	
Were all sample quantitation and reporting requirements met?	X			
1) Were all solid samples reported with percent solids $>50\%$?	X			
2) Were any samples analyzed or reported with dilutions?	X			
Miscellaneous Items				
1) For solids by 7196A, was the pH within a range of 7.0-8.0?	X			
2) For solids by 7199, was the pH within a range of 9.0-9.5?			X	
3) For aqueous by 7196A, was the pH with a range of 1.5-2.5?	X			
4) For solids (3060A), was the digestion temperature 90-95C for at least 60 minutes?	X			
5) For 7199, was each sample injected twice and was the RPD $<20\%$?			X	

SDG#: JB97861/ Method 7196

Batch: GN28050

Cr+6 ICAL 06/29/15

Solid

(p. 37 of data pkg)

x - concentration	y - response
0	0
0.01	0.01
0.05	0.042
0.1	0.084
0.3	0.240
0.5	0.408
0.8	0.658
1	0.854

(p. 37 of data pkg)

AECOM Calculated Offset	-0.0031	OK	Reported Offset	-0.0031
AECOM Slope	0.8409	OK	Reported Slope	0.8409
AECOM Calculated r	0.99958	OK	Reported r	0.99958

LCS calculation

GP90175-B1 P. 16,37

Background Absorbance	0
Total absorbance	0.767
Total absorbance - background	0.767
Instrument Concentration	0.916
Sample weight (mg/kg)	0.0025
Final Volume (L)	0.1
Dilution Factor	1

AECOM Calculated LCS Result (mg/Kg)	36.6	OK	Reported Result (mg/Kg)	36.6
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%R = Found/True*100

GP90175-B1 P. 16,37

True Value (mg/kg)	40
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AECOM Calculated %R	92	OK	Reported %R	92
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MS calculation

GP90175-S1 P. 18,19,37 JB97861-1

Background reading	0.001
Total absorbance	0.458
Total absorbance - background	0.457
Instrument Concentration	0.5472
Sample weight (mg/kg)	0.00252
Final Volume (L)	0.1
Percent solids	0.976
Dilution Factor	5

AECOM Calculated MS Result (mg/Kg)	111	OK	Reported Result (mg/Kg)	111
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%R = Found/True*100

GP90175-S1 P. 18,19,37 JB97861-1

True Value (mg/kg)	40.7
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Native concentration (mg/Kg)	65
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AECOM %R	113.6	OK, rounding	Reported %R	113.1
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Percent Solids

JB97861-1 P. 19 90 FORREST-2015-Q2

Empty dish weight=	26.13
Wet weight=	31.60
Dry weight=	31.47

AECOM %solids =	97.6	OK	Reported %solids=	97.6
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Reporting Limit	JB97861-1	P. 8,19,37	90 FORREST-2015-Q2
Low Standard	0.01		
Initial weight (mg/kg)	0.00257		
Final volume (L)	0.1		
Percent solids	0.976		
Dilution Factor	5		
Reporting Limit	2.0	OK, rounding	Reported RL (mg/Kg)= 2.0

Sample Calculations	JB97861-1	P. 8,19,37	90 FORREST-2015-Q2
Background reading	0.002		
Total absorbance	0.273		
Total absorbance - background	0.271		
Instrument Response	0.326		
Sample weight (mg/kg)	0.00257		
Final Volume (L)	0.1		
Percent solids	0.976		
Dilution Factor	5		
AECOM Calculated Result (mg/Kg)	65.0	OK	Reported Result (mg/Kg) 65.0

Client Name: PPG Industries	Project Number: 60337923.GA.RA.IRM.2015
Site Location: PPG Garfield Avenue IRM - Forrest, Jersey City, NJ	Project Manager: Scott Mikaelian
Laboratory: Accutest, Dayton, NJ	Type of Validation: Limited
Laboratory Job No: JB97861A	Date Checked: 7/8/2015
Validator: Dawn Brule	Peer: Lisa Krowitz

ITEM	YES	NO	N/A	COMMENTS
Sample results included?	X			
Reporting Limits met project requirements?	X			
Field I.D. included?	X			
Laboratory I.D. included?	X			
Sample matrix included?	X			
Sample receipt temperature 2-6C?	X			
Signed COCs included?	X			
Date of sample collection included?	X			
Date of sample digestion included?	X			
Date of analysis included?	X			
Holding time met QC criteria? (Metals -180 days from sample collection; Mercury - 28 days from sample collection. If HT exceeded by 10 days R all results.	X			
Method reference included?	X			
Laboratory Case Narrative included?	X			

Definitions: MDL - Method Detection Limit; %R - Percent Recovery; RL - Reporting Limit; RPD - Relative Percent Difference; RSD - Relative Standard Deviation ;Corr - Correlation Coefficient.

ITEM	YES	NO	N/A	COMMENTS
Sample dilutions?		X		
Initial calibration documentation included in lab package?			X	
1) Calibrate daily or each time instrument is set up.			X	
2) ICP (6010) -Blank plus 1 standard? If no, reject (R) data.			X	
3) Hg (7470/7471) -Blank plus 5 standards? If no, reject (R) data.			X	
Initial Calibration Verification Standard (ICV) for ICP (6010) and Initial Calibration Check Standard (ICCS) for Hg (7470/7471) included in lab package?			X	
1) Analyzed immediately after initial calibration? If no, reject (R) data.			X	
2) %R criteria met? (90-110%). If no, J positive results for affected analyte(s) if %R between 80-89% and 111-120% and indicate bias; UJ non-detect results for affected analyte(s) if %R between 80-89% , and R all data for affected analyte(s) if %R <80% or >120%.			X	
3) Spot check ICV/ICCS results for several analytes.			X	
Continuing Calibration Verification Standard (CCV) for ICP (6010) and Calibration Check Standard (CCS) for Hg (7470/7471) included in Lab Package?			X	
1) Analyzed immediately after each ICV/ICC/CB and after every 10 samples? If no, reject (R) data.			X	
2) CCS and CCV from independent source and at mid-level of calibration curve. If no, reject (R) data.			X	
3) %R criteria met? (90-110%R). If no, J positive results for affected analyte(s) if %R between 80-89% and 111-120% and indicate bias; UJ non-detect results for affected analyte(s) if %R between 80-89% and R all data for affected analyte(s) if %R <80% or >120%.			X	
4) Spot check CCV/CCS results for several analytes.			X	
Low Calibration Standard (CRI) included in Lab Package?			X	
1) %R criteria met? - 50-150% for Co, Mn, Zn, by ICP-MS; Pb, Tl by 6010; 70-130% all others. If no, refer to ILM05.4 NJ SOP 5.A.2 for actions.			X	

ITEM	YES	NO	N/A	COMMENTS
Calibration Blanks	X			
1) Analyzed after daily calibration and after each ICV/ICC/CCV/CCS and after every 10 samples? If no, reject (R) data.	X			
2) Absolute value <3xIDL? If no, -if sample result <10x CB result, qualify affected analyte(s) in associated samples with CB; -if sample result >10xCB result, no qualification.	X			
Method Blank Included in Lab Package?	X			
1) Method blank analyzed with each preparation batch or every SDG, or 1/20 samples? If no, reject (R) data, except no aqueous MB required for FB/EB if only solid samples were analyzed.	X			
2) Method blank analyzed 1/20 samples? If - MB 1/25, J sample results from 21-25; -MB >1/25, R sample results after 25th sample.	X			
3) MB results nondetect? If no, -sample result <3xMB, negate UB; -sample result>3xMB but <10xMB, JB; -sample result >10xMB, no qualification.		X		AQ MB >MDL but < RL; negate EB
4) Negative MB result reported? If yes, -Positive sample result<10xMB, qualify estimated, biased low (J); -Non-detect sample result , qualify UJ, may be false non-detect.		X		
Field Blanks/Equipment Blanks Included in Lab Package?	X			
1) FB/EB result non-detect? If no, -sample result <3xFB/EB, negate U; -sample result>3xFB/EB but <10xMB, J; -sample result >10xFB/EB, no qualification.		X		samp >10x EB; no qual
ICP Interference Check Sample (ICS) included in Lab Package?	X			
1) Analyzed at beginning of analytical run? If no, reject (R) data.	X			
2) %R criteria met? (80-120%) If no, %R>120%, no qualification if sample result non-detect; %R between 121-150%, J positive results, biased high; %R between 50-79%, J/UJ results, biased low; %R<50% or >150%, reject (R) result	X			
3) Spot check accuracy of %Rs			X	

ITEM	YES	NO	N/A	COMMENTS
Matrix Spike/Matrix Spike Duplicate Data Included in Lab Package?	X			
1) MS/MSD %R (75-125%R) and RPD (+20%) criteria met? - %R>125% J positive results for affected analyte(s) for all samples in the same batch/SDG, accept NDs; -%R<75% J/UJ for affected analyte(s) for all samples in the same batch/SDG; - RPD outside +20% J positive results for affected analyte(s) for all samples in the same batch/SDG, accept NDs.	X			
2) Was a sample spiked at the frequency of 1/batch or 20 samples?	X			
3) Was the MS performed on a site sample?		X		
4) Was the MS performed on a FB/EB or TB? If yes, J all sample data.			X	
Post Digestion Spike			X	
1) %R criteria met? (75-125%R) - %R>125% J positive results for affected analyte(s) for all samples in the same batch/SDG, accept NDs.; - %R<75% J/UJ affected analyte(s) for all samples in the same batch/SDG.			X	
2) Was the spike performed on a FB/EB or TB? If yes, J all sample data.			X	
3) Was a sample spiked at the frequency of 1/batch or 20 samples?			X	
Laboratory Duplicate Data Included in Lab Package?		X		
Aqueous - If RPD is >20% and sample and duplicate results are >5x the QL, estimate (J) results >the QL. -. If sample and/or duplicate is <5x the QL and absolute difference is > the QL, estimate (J) positive results <5x the QL and nondetects (UJ).-			X	
Solid - If RPD is >30%and sample and duplicate results are >5x the QL, estimate (J) results > the QL. - If sample and/or duplicate is <5x the QL and absolute difference is >2the QL, estimate (J) positive results <5x QL and nondetects (UJ). -			X	
Was a Laboratory Control Sample (LCS) Included in Lab Package?	X			
1) LCS %R criteria met? (80-120%R). If no, J/UJ all affected analytes(s) for all samples in the same batch/SDG.	X			
2) Was an LCS analyzed at the frequency of 1/batch or 20 samples? If no, J/UJ affected analyte(s) for all samples in the same batch/SDG.	X			

ITEM	YES	NO	N/A	COMMENTS
Serial Dilution	X			
1) %D(<10%R) criteria met? - If analyte concentration >25xIDL (7000) or >10xIDL (6010) and %D >10% J positive results for affected analyte(s) for all samples in the same batch/SDG, accept NDs.	X			
2) Was the frequency 1/batch or 20 samples?	X			
3) Was a site sample used?			X	
4) Was a FB/EB or TB used? If yes, J all sample data.			X	
5) Spot check accuracy of %Ds.				
Field Duplicate Data included in Lab Package?		X		
Aqueous - If RPD is >30% and sample and field duplicate results are >5x the QL, estimate (J) results > the QL. - - If sample and/or duplicate is <5x the QL and absolute difference is > the QL, estimate (J) positive results <5x the QL and nondetects (UJ). -			X	
Solid - If RPD is >50% and sample and field duplicate results are >5x the QL, estimate (J) results > the QL. - If sample and/or duplicate is <5x the QL and absolute difference is > the QL, estimate (J) positive results <5x QL and nondetects (UJ). -			X	
Percent Solids data included in Lab Package?	X			
1) %Solids criteria (Reg 2 criteria) met? (>=50%)	X			

Laboratory Blanks

Blank ID	Analyte	Result	QL	Units	Associated Samples
MP87381 MB	CHROMIUM	0.90	10	ug/L	90-FB2015625

Data Validation Report

Project:	PPG - Forrest PDI	
Laboratory:	SGS/Accutest, Dayton, NJ	
Laboratory Job No.:	JC22558 and JC22558R	
Analysis/Method:	Hexavalent Chromium SW846 3060A/7196A	
Validation Level:	Full	
Site Location/Address:	70 Carteret Avenue, Jersey City, NJ	
AECOM Project No:	60314351.GA.DE.PDI.FOR	
Prepared by:	Kristin Rutherford /AECOM	Completed on: 08/24/2016
Reviewed by:	Mary Kozik /AECOM	File Name: JC22558_R_2016-08-24_DVReport-F

Introduction

The data were reviewed in accordance with the FSP-QAPP and the following NJDEP validation Standard Operating Procedure (SOP):

- NJDEP Office of Data Quality SOP 5.A.10, Rev 3 (September 2009), SOP for Analytical Data Validation of Hexavalent Chromium - for USEPA SW-846 Method 3060A, USEPA SW-846 Method 7196A and USEPA SW-846 Method 7199.

The results of quality control data analyzed with site samples were used to assess the overall reliability of the data. The following qualifiers were used to identify data quality issues:

- U: Indicates the analyte was not detected in the sample above the sample reporting limit.
- J: Indicates the result was an estimated value; the associated numerical value was an approximate concentration of the analyte in the sample.
- UJ: Indicates the analyte was not detected above the reporting limit and the reporting limit was approximate.
- UB: The analyte concentration is less than or equal to three (3) times the concentration in the associated method/prep blank. The presence of the analyte in the sample is negated (UB) due to laboratory contamination.
- JB: The analyte concentration is greater than three (3) times, but less than or equal to ten (10) times the concentration in the associated method/prep blank. The presence of that analyte in the sample is considered "real". The concentration is quantitatively qualified (JB) due to method blank contamination.
- R: The sample result was rejected due to serious deficiencies; the presence or absence of the analyte could not be confirmed.
- RA: The sample result was rejected but is still considered usable.

Sample Information

The samples listed below were collected by AECOM on June 20, 2016 as part of the PPG – Forrest PDI sampling at 70 Carteret Avenue, Jersey City, New Jersey. Only the samples and parameters listed below were validated.

Field ID	Laboratory ID	Matrix	Fraction
FOR-FB20160620 (Equipment Blank)	JC22558-1	Aqueous	Hexavalent Chromium
P4-FOR-DD10B-0.5-1.0	JC22558-2	Soil	Hexavalent Chromium
P4-FOR-DD10B-0.5-1.0	JC22558-2R	Soil	Hexavalent Chromium
P4-FOR-DD10B-2.0-2.5	JC22558-3	Soil	Hexavalent Chromium
P4-FOR-DD10B-2.0-2.5	JC22558-3R	Soil	Hexavalent Chromium
P4-FOR-DD10B-2.5-3.0	JC22558-4	Soil	Hexavalent Chromium
P4-FOR-DD10B-2.5-3.0	JC22558-4R	Soil	Hexavalent Chromium
P4-FOR-X11B-7.5-8.0	JC22558-9	Soil	Hexavalent Chromium
P4-FOR-X11B-7.5-8.0	JC22558-9R	Soil	Hexavalent Chromium
P4-FOR-X11B-8.0-8.5	JC22558-10	Soil	Hexavalent Chromium
P4-FOR-X11B-8.0-8.5	JC22558-10R	Soil	Hexavalent Chromium
P4-FOR-Z12B-1.0-1.5	JC22558-11	Soil	Hexavalent Chromium
P4-FOR-Z12B-1.0-1.5	JC22558-11R	Soil	Hexavalent Chromium
P4-FOR-Z12B-3.0-3.5	JC22558-12	Soil	Hexavalent Chromium
P4-FOR-Z12B-3.0-3.5	JC22558-12R	Soil	Hexavalent Chromium
P4-FOR-Z12B-3.0-3.5X (Field Duplicate of P4-FOR-Z12B-3.0-3.5)	JC22558-13	Soil	Hexavalent Chromium
P4-FOR-Z12B-3.0-3.5X (Field Duplicate of P4-FOR-Z12B-3.0-3.5)	JC22558-13R	Soil	Hexavalent Chromium
P4-FOR-Z12B-6.0-6.5	JC22558-14	Soil	Hexavalent Chromium
P4-FOR-Z12B-6.0-6.5	JC22558-14R	Soil	Hexavalent Chromium
P4-FOR-Z12B-6.5-7.0	JC22558-15	Soil	Hexavalent Chromium
P4-FOR-Z12B-6.5-7.0	JC22558-15R	Soil	Hexavalent Chromium

The samples were collected following the procedures detailed in the Work Order for Garfield Avenue Remedial Action (GARA) at 70 Carteret Avenue, Jersey City, NJ and the Field Sampling Plan/Quality Assurance Project Plan for Non-Residential and Residential Chromium Sites Hudson County, New Jersey (December 2011).

General Comments

The data package was complete. Four samples (P4-FOR-DD10B-4.5-5.0, P4-FOR-DD10B-6.5-7.0, P4-FOR-X11B-10.0-10.5, and P4-FOR-X11B-12.0-12.5) were submitted on hold and were not subsequently analyzed. Quality control (QC) issues identified during validation are discussed below. Refer to the Target Analyte Summary Hit(s) in Attachment A for a listing of all detected results, qualified results, and associated qualifications, where applicable. The nonconformances for each section discussed below are presented in Attachment B.

MS Results

Sample P4-FOR-DD10B-2.5-3.0 (JC22558-4) was selected for the soil matrix spike analysis and used for supporting data quality recommendations. The soluble and insoluble matrix spike (MS) recoveries from the initial batch were -0.1% and 88.2%, respectively. The soluble MS recovery did not meet quality control (QC) criteria of 75-125%R and was less than 50%. The post digestion spike (PDS) recovery was 95%, which met the PDS criteria of 85-115%.

Based on poor MS recoveries less than 75%R, the MS and associated samples were reanalyzed using Method 7196. The soluble and insoluble matrix spike recoveries from the re-analysis were 2.6% and 100.7%, respectively. The soluble MS recovery did not meet the QC criteria of 75-125%R and was less than 50%. The PDS recovery for the re-analysis batch was 91%, which met the PDS criteria of 85-115%.

Since the soluble and/or insoluble MS recoveries were outside the acceptable QC limit of 75-125%, additional parameters were analyzed to determine if possible matrix interferences could be the cause for the poor matrix spike recoveries. All the soil samples were tested for pH and oxidation reduction potential (ORP) and plotted on an Eh/pH phase diagram chart. From this chart, the source sample for the matrix spike analysis was plotted below the phase change line, indicating reducing potential within the sample matrix, incapable of supporting hexavalent chromium. Analyses for ferrous iron, sulfide screen, and total organic carbon (TOC) were performed on the MS source sample to confirm the oxidizing/reducing potential within the sample matrix. The sulfide screen was reported as nondetect, indicating no reducing agents within the sample matrix; however, the ferrous iron (1.7%) and the TOC results (11,900 mg/Kg) were positive, indicating potential reducing agents within the sample matrix.

Since the MS recoveries from both the initial and reanalysis did not meet the MS QC requirements, but at least one MS recovery was greater than 50%, the highest detected hexavalent chromium result or the nondetect hexavalent chromium result with the lowest reporting limit (RL) was reported for each soil sample. The reported hexavalent chromium results in all the soil samples in this SDG were qualified as estimated (J/UJ) due to the poor MS recoveries.

Field Duplicate Results

The field duplicate pair in this SDG was P4-FOR-Z12B-3.0-3.5 (JC22558-12) and P4-FOR-Z12B-3.0-3.5X (JC22558-13).

The relative percent difference (RPD) for the reported parent sample and field duplicate results was above the QC criteria; therefore, all reported hexavalent chromium soil results were qualified as estimated (J/UJ).

Sample Results

Reported results (flagged B by the laboratory) that were less than the RL but greater than or equal to the method detection limit (MDL) are approximate values and have been qualified as estimated (J).

Data Quality and Usability

In general, these data appear to be valid and may be used for decision-making purposes. No data were rejected. Qualified results, if applicable, are presented in Attachments A and B.

The hexavalent chromium soil results in this SDG are usable as estimated values with potential low bias due to low soluble MS recovery, and since the MS sample matrix appears to be reducing based on the Eh-pH plot and the presence of TOC and ferrous iron.

Sample results qualified due to poor field duplicate precision are usable as estimated values with an unknown direction of bias.

Sample results reported between the MDL and RL are usable as estimated values with an unknown directional bias.

ATTACHMENTS

Attachment A: Target Analyte Summary Hitlist(s)

Attachment B: Data Validation Report Form

Attachment A

Target Analyte Summary Hitlist(s)

Soil Target Analyte Summary Hit List (Hexavalent Chromium)

Site Name PPG- Forrest PDI
Sampling Date June 20, 2016
Lab Name/ID SGS/Accutest, Dayton, NJ
SDG No JC22558 and JC22558R
Sample Matrix Soil
Trip Blank ID NA
Field Blank ID FOR-FB20160620

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
P4-FOR-DD10B-0.5-1.0	JC22558-2R	CHROMIUM (HEXAVALENT)	U	1.9	1.9	0.45	Qualify	2,3
P4-FOR-DD10B-2.0-2.5	JC22558-3	CHROMIUM (HEXAVALENT)	U	0.48B	0.48	0.50	Qualify	1,2,3
P4-FOR-DD10B-2.5-3.0	JC22558-4	CHROMIUM (HEXAVALENT)	U	0.74	0.74	0.50	Qualify	2,3
P4-FOR-X11B-7.5-8.0	JC22558-9	CHROMIUM (HEXAVALENT)	U	0.65	0.65	0.48	Qualify	2,3
P4-FOR-X11B-8.0-8.5	JC22558-10	CHROMIUM (HEXAVALENT)	U	U	U	0.53	Qualify	2,3
P4-FOR-Z12B-1.0-1.5	JC22558-11	CHROMIUM (HEXAVALENT)	U	0.39B	0.39	0.55	Qualify	1,2,3
P4-FOR-Z12B-3.0-3.5	JC22558-12R	CHROMIUM (HEXAVALENT)	U	28.9	28.9	0.50	Qualify	2,3
P4-FOR-Z12B-3.0-3.5X	JC22558-13	CHROMIUM (HEXAVALENT)	U	17.2	17.2	0.47	Qualify	2,3
P4-FOR-Z12B-6.0-6.5	JC22558-14	CHROMIUM (HEXAVALENT)	U	1.2	1.2	0.55	Qualify	2,3
P4-FOR-Z12B-6.5-7.0	JC22558-15R	CHROMIUM (HEXAVALENT)	U	0.42B	0.42	0.60	Qualify	1,2,3

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

NJDEP Laboratory Footnote

1. The reported result was greater than the MDL but less than the RL and therefore was estimated.
2. The reported value was qualified because the soluble and/or insoluble matrix recoveries were less than 75%, but greater than 50%.

3. In the Field Duplicate Sample Analysis, Hexavalent Chromium fell outside the control limits of $\leq 20\%$ for sample results $> 4xRL$ or $+ RL$ for sample results $< 4xRL$. Therefore, the result was qualified.

Attachment B

Data Validation Report Form

Client Name: PPG Industries	Project Number: 60314351.GA.DE.PDI.FOR
Site Location: PPG- Forrest PDI, Jersey City, NJ	Project Manager: Aimee Ruitter
Laboratory: SGS/Accutest, Dayton, NJ	Type of Validation: Full
Laboratory Job No: JC22558 and JC22558R	Date Checked: 08/24/2016
Validator: Kristin Rutherford	Peer: Mary Kozik

ITEM	YES	NO	N/A	COMMENTS
Sample results included?	X			
Reporting Limits met project requirements?	X			
Field I.D. included?	X			
Laboratory I.D. included?	X			
Did data package sample IDs match sample IDs on COC?	X			
Did electronic data deliverable (EDD) sample IDs match COC sample IDs?	X			
Did data package sample IDs match electronic data deliverable (EDD) sample IDs?	X			
Sample matrix included?	X			
Sample receipt temperature 2-6°C?	X			4.8 °C
Signed COCs included?	X			
Date of sample collection included?	X			
Date of sample digestion included?	X			
Holding time to digestion met criteria? (Soils -30 days from collection to digestion.)	X			
Date of analysis included?	X			
Holding time to analysis met criteria? (Soils -168 hours from digestion to analysis; Aqueous - 24 hours from collection to analysis.)	X			
Method reference included?	X			
Laboratory Case Narrative included?	X			

Definitions: MDL - Method Detection Limit; %R - Percent Recovery; RL - Reporting Limit; RPD - Relative Percent Difference; RSD - Relative Standard Deviation ;Corr - Correlation Coefficient.

ITEM	YES	NO	N/A	COMMENTS
Initial calibration documentation included in lab package?	X			
1) Blank plus 4 standards (7196A) or blank plus 3 standards (7199)	X			
2) Correlation coefficient of >0.995 (7196A) or >0.999 (7199)	X			
3) Calibrate daily or each time instrument is set up.	X			
Calibration Check Standard (CCS) for 7196A and Quality Control Sample (QCS) for 7199 Included in Lab Package?	X			
1) %R criteria met? (90 - 110%)	X			
2) Correct frequency of one per every 10 samples	X			
3) CCS and QCS from independent source and at mid- level of calibration curve	X			
Calibration Blanks	X			
1) Analyzed prior to initial calibration standards and after each CCS/QCS?	X			
2) Absolute value should not exceed MDL.	X			
Method Blank, Field Blanks and/or Equipment Blanks Included in Lab Package?	X			
1) Method blank analyzed with each preparation batch?	X			
2) Absolute value should not exceed MDL.	X			
Eh and pH Data	X			
1) Eh and pH data was included and plotted for all samples?	X			
Soluble Matrix Spike Data Included in Lab Package?	X			JC22558-4
1) Soluble Matrix %R criteria met? (75-125%R).		X		See nonconformance tables.
2) Was the spike concentration 40 mg/Kg or twice the sample concentration?	X			Spiked at 48.5 and 44.16 mg/kg.
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	X			
Insoluble Matrix Spike Data Included in Lab Package?	X			
1) Insoluble Matrix %R criteria met? (75-125%R).	X			
2) Was the spike concentration around 400 to 800 mg/Kg?		X		Spiked at 861 and 855 mg/kg. No impact on data.
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	X			
Post Digestion Spike	X			

ITEM	YES	NO	N/A	COMMENTS
1) Post Digestion Spike %R criteria met? (85-115%R).	X			
2) Was the spike concentration 40 mg/Kg or twice the sample concentration?	X			
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	X			
Sample Duplicate Data Included in Lab Package?	X			JC22558-4, -4R
1.) RPD criteria met? (RPD < 20%) if both results are ≥4x RL or control limit of ± RL if both results are <4xRL.	X			See tables. Abs diff criteria met.
2) Was a sample duplicate analyzed at the frequency of 1 per batch or 20 samples?	X			
Was a Laboratory Control Sample (LCS) Included in Lab Package?	X			
1) %R criteria met? (80-120%R).	X			
2) Was an LCS analyzed at the frequency of 1/batch or 20 samples?	X			
Were any Field Duplicate samples submitted with this SDG?	X			P4-FOR-Z12B-3.0-3.5 and P4-FOR-Z12B-3.0-3.5X (JC22558-12 & -13)
1) RPD criteria met? (RPD < 20%) if both results are ≥4x RL or control limit of ± RL if both results are <4xRL.		X		See nonconformance tables. Qualify all soils (J/UJ).
Were all sample quantitation and reporting requirements met?	X			
1) Were all solid samples reported with percent solids > 50%?	X			
2) Were any samples analyzed or reported with dilutions?		X		no dilutions
Miscellaneous Items	X			
1) For soils by 7196A, was the pH within a range of 7.0-8.0?	X			
2) For soils by 7199, was the pH within a range of 9.0-9.5?			X	
3) For aqueous by 7196A, was the pH with a range of 1.5-2.5?	X			
4) For soils (3060A), was the digestion temperature 90-95C for at least 60 minutes?	X			
5) For 7199, was each sample injected twice and was the RPD ≤20?			X	

Matrix Spikes

Sample ID	Analyte	Matrix Spike	% Recovery	Lower Limit	Upper Limit	PDS %	PDS Limits %
P4-FOR-DD10B-2.5-3.0	CHROMIUM (HEXAVALENT)	Soluble	-0.1	75	125	95	85-115
P4-FOR-DD10B-2.5-3.0	CHROMIUM (HEXAVALENT)	Insoluble	88.2	75	125		
P4-FOR-DD10B-2.5-3.0	CHROMIUM (HEXAVALENT)	Soluble	2.6	75	125	91	85-115
P4-FOR-DD10B-2.5-3.0	CHROMIUM (HEXAVALENT)	Insoluble	100.7	75	125		

Lab Duplicates

Sample ID	Lab ID	Analyte	Sample Result	Qual	Duplicate Result	Qual	QL	Units	RPD	Action
P4-FOR-DD10B-2.5-3.0	JC22558-4	CHROMIUM (HEXAVALENT)	0.74		0.87		0.50	mg/kg	16.1	none, criteria met
P4-FOR-DD10B-2.5-3.0	JC22558-4R	CHROMIUM (HEXAVALENT)	0.41	B	0.58		0.50	mg/kg	34.3	Abs Diff <RL, no actions

Field Duplicates

Sample ID	Duplicate ID	Analyte	Sample Result	Qual	Duplicate Result	Qual	QL	Units	RPD	Action
P4-FOR-Z12B-3.0-3.5	P4-FOR-Z12B-3.0-3.5X	CHROMIUM (HEXAVALENT)	28.9		17.2		0.50	mg/kg	51	Estimate (J/UJ) in all soil samples

SDG#: JC22558/ Method 7196

Batch: GN48457

Cr+6 ICAL 7/02/16

Soil

(p. 57 of data pkg)

x - concentration	y - response
0	0.001
0.01	0.009
0.05	0.043
0.1	0.086
0.3	0.241
0.5	0.419
0.8	0.651
1	0.840

(p. 57 of data pkg)

AECOM Calculated Offset	-0.0001	OK	Reported Offset	-0.0001
AECOM Slope	0.8299	OK	Reported Slope	0.8299
AECOM Calculated r	0.99975	OK	Reported r	0.99975

LCS calculation

GP98662-B1 P. 34, 57

Background Absorbance	0.002
Total absorbance	0.710
Total absorbance - background	0.708
Instrument Concentration	0.853
Sample weight (mg/kg)	0.0025
Final Volume (L)	0.1
Dilution Factor	1

AECOM Calculated LCS Result (mg/Kg)	34.1	OK	Reported Result (mg/Kg)	34.1
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%R = Found/True*100

GP98662-B1 P. 34, 57

True Value (mg/kg)	40
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AECOM Calculated %R	85.3	OK	Reported %R	85.3
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MS calculation

GP98662-S1 P. 36, 57 JC22558-4

Background reading	0.009
Total absorbance	0.021
Total absorbance - background	0.012
Instrument Concentration	0.0145
Sample weight (mg/kg)	0.00255
Final Volume (L)	0.1
Percent solids	0.808
Dilution Factor	1

AECOM Calculated MS Result (mg/Kg)	0.70	OK	Reported Result (mg/Kg)	0.70
------------------------------------	------	----	-------------------------	------

%R = Found/True*100

GP98662-S1 P. 36, 57 JC22558-4

True Value (mg/kg)	48.5
--------------------	------

Native concentration (mg/Kg)	0.74
------------------------------	------

AECOM %R	-0.1	OK	Reported %R	-0.1
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Percent Solids

JC22558-4 P. 37 P4-FOR-DD10B-2.5-3.0

Empty dish weight=	17.53
Wet weight=	25.04
Dry weight=	23.6

AECOM %solids =	80.8	OK	Reported %solids=	80.8
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Reporting Limit

JC22558-4 P. 11,33,55 P4-FOR-DD10B-2.5-3.0

Low Standard	0.01
Initial weight (mg/kg)	0.00243
Final volume (L)	0.1
Percent solids	0.808
Dilution Factor	1

Reporting Limit	0.51	OK, rounding	Reported RL (mg/Kg)=	0.50
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Sample Calculations**JC22558-4****P. 11,33,55****P4-FOR-DD10B-2.5-3.0**

Background reading	0.014
Total absorbance	0.026
Total absorbance - background	0.012
Instrument Response	0.015
Sample weight (mg/kg)	0.00243
Final Volume (L)	0.1
Percent solids	0.808
Dilution Factor	1

AECOM Calculated Result (mg/Kg)	0.74	OK	Reported Result (mg/Kg)	0.74
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Data Validation Report

Project:	PPG - Forrest PDI
Laboratory:	SGS/Accutest, Dayton, NJ
Laboratory Job No.:	JC22855 and JC22855R
Analysis/Method:	Hexavalent Chromium SW846 3060A/7196
Validation Level:	Full
Site Location/Address:	70 Carteret Avenue, Jersey City, NJ
AECOM Project No:	60314351.GA.DE.PDI.FOR
Prepared by:	Charlene Livingston Flint /AECOM Completed on: 08/29/2016
Reviewed by:	Mary Kozik /AECOM File Name: JC22855_R_2016-08-29_DVReport-F

Introduction

The data were reviewed in accordance with the FSP-QAPP and the following NJDEP validation Standard Operating Procedure (SOP):

- NJDEP Office of Data Quality SOP 5.A.10, Rev 3 (September 2009), SOP for Analytical Data Validation of Hexavalent Chromium - for USEPA SW-846 Method 3060A, USEPA SW-846 Method 7196A and USEPA SW-846 Method 7199;

The results of quality control data analyzed with site samples were used to assess the overall reliability of the data. The following qualifiers were used to identify data quality issues:

- U: Indicates the analyte was not detected in the sample above the sample reporting limit.
- J: Indicates the result was an estimated value; the associated numerical value was an approximate concentration of the analyte in the sample.
- UJ: Indicates the analyte was not detected above the reporting limit and the reporting limit was approximate.
- UB: The analyte concentration is less than or equal to three (3) times the concentration in the associated method/prep blank. The presence of the analyte in the sample is negated (UB) due to laboratory contamination.
- JB: The analyte concentration is greater than three (3) times, but less than or equal to ten (10) times the concentration in the associated method/prep blank. The presence of that analyte in the sample is considered "real". The concentration is quantitatively qualified (JB) due to method blank contamination.
- R: The sample result was rejected due to serious deficiencies; the presence or absence of the analyte could not be confirmed.
- RA: The sample result was rejected but is still considered usable.

Sample Information

The samples listed below were collected by AECOM on June 23, 2016 as part of the PPG - Forrest PDI sampling at 70 Carteret Avenue, Jersey City, New Jersey. Only the samples and parameters listed below were validated.

Field ID	Laboratory ID	Matrix	Fraction
FOR-FB20160623 (Equipment Blank)	JC22855-1	Aqueous	Hexavalent Chromium
P4-FOR-CC10B-1.0-1.5	JC22855-2	Soil	Hexavalent Chromium
P4-FOR-CC10B-10.5-11.0	JC22855-3	Soil	Hexavalent Chromium
P4-FOR-CC10B-11.0-11.5	JC22855-4	Soil	Hexavalent Chromium
P4-FOR-CC10B-3.0-3.5	JC22855-5	Soil	Hexavalent Chromium
P4-FOR-CC10B-5.0-5.5	JC22855-6	Soil	Hexavalent Chromium
P4-FOR-CC10B-7.0-7.5	JC22855-7	Soil	Hexavalent Chromium
P4-FOR-CC10B-9.0-9.5	JC22855-8	Soil	Hexavalent Chromium
P4-FOR-FF9B-1.0-1.5	JC22855-9	Soil	Hexavalent Chromium
P4-FOR-FF9B-11.0-11.5	JC22855-10	Soil	Hexavalent Chromium
P4-FOR-FF9B-11.5-12.0	JC22855-11	Soil	Hexavalent Chromium
P4-FOR-FF9B-3.0-3.5	JC22855-12	Soil	Hexavalent Chromium
P4-FOR-FF9B-3.0-3.5	JC22855-12R	Soil	Hexavalent Chromium
P4-FOR-FF9B-3.0-3.5X (Field Duplicate of P4-FOR-FF9B-3.0-3.5)	JC22855-13	Soil	Hexavalent Chromium
P4-FOR-FF9B-3.0-3.5X (Field Duplicate of P4-FOR-FF9B-3.0-3.5)	JC22855-13R	Soil	Hexavalent Chromium
P4-FOR-FF9B-5.0-5.5	JC22855-14	Soil	Hexavalent Chromium
P4-FOR-FF9B-5.0-5.5	JC22855-14R	Soil	Hexavalent Chromium
P4-FOR-FF9B-7.0-7.5	JC22855-15	Soil	Hexavalent Chromium
P4-FOR-FF9B-7.0-7.5	JC22855-15R	Soil	Hexavalent Chromium
P4-FOR-FF9B-9.0-9.5	JC22855-16	Soil	Hexavalent Chromium
P4-FOR-FF9B-9.0-9.5	JC22855-16R	Soil	Hexavalent Chromium
P4-FOR-Y12B-0.5-1.0	JC22855-17	Soil	Hexavalent Chromium
P4-FOR-Y12B-0.5-1.0	JC22855-17R	Soil	Hexavalent Chromium
P4-FOR-Y12B-2.0-2.5	JC22855-18	Soil	Hexavalent Chromium
P4-FOR-Y12B-2.0-2.5	JC22855-18R	Soil	Hexavalent Chromium
P4-FOR-Y12B-4.0-4.5	JC22855-19	Soil	Hexavalent Chromium
P4-FOR-Y12B-4.0-4.5	JC22855-19R	Soil	Hexavalent Chromium
P4-FOR-Y12B-6.0-6.5	JC22855-20	Soil	Hexavalent Chromium
P4-FOR-Y12B-6.0-6.5	JC22855-20R	Soil	Hexavalent Chromium
P4-FOR-Y12B-6.5-7.0	JC22855-21	Soil	Hexavalent Chromium
P4-FOR-Y12B-6.5-7.0	JC22855-21R	Soil	Hexavalent Chromium
P4-FOR-Y12B-7.0-7.5	JC22855-22	Soil	Hexavalent Chromium
P4-FOR-Y12B-7.0-7.5	JC22855-22R	Soil	Hexavalent Chromium

The samples were collected following the procedures detailed in the Work Order for Garfield Avenue Remedial Action (GARA) at 70 Carteret Avenue, Jersey City, NJ and the Field Sampling Plan/Quality Assurance Project Plan for Non-Residential and Residential Chromium Sites Hudson County, New Jersey (December 2011).

General Comments

The data package was complete. Quality control (QC) issues identified during validation are discussed below. Refer to the Target Analyte Summary Hit(s) in Attachment A for a listing of all detected results, qualified results, and associated qualifications, where applicable. The nonconformances for each section discussed below are presented in Attachment B.

MS Results

There were two matrix spike (MS) samples associated with the samples in this SDG:

- P4-FOR-CC10B-3.0-3.5 (JC22855-5), which is described as consisting of silt, a trace of clay, red brown in color and is associated by matrix type with itself and sample P4-FOR-Y12B-7.0-7.5 (JC22855-22). It is also associated by batch QC with samples P4-FOR-CC10B-10.5-11.0 (JC22855-3), P4-FOR-CC10B-11.0-11.5 (JC22855-4), P4-FOR-CC10B-7.0-7.5 (JC22855-7), P4-FOR-CC10B-9.0-9.5 (JC22855-8), P4-FOR-FF9B-11.0-11.5 (JC22855-10) and P4-FOR-FF9B-11.5-12.0 (JC22855-11).
- P4-FOR-FF9B-3.0-3.5 (JC22855-12), which is described as consisting of fine - medium sand, fine gravel, ash and coal and is associated by matrix type with itself and samples P4-FOR-CC10B-1.0-1.5 (JC22855-2), P4-FOR-CC10B-5.0-5.5 (JC22855-6), P4-FOR-FF9B-1.0-1.5 (JC22855-9), P4-FOR-FF9B-3.0-3.5X (JC22855-13) and P4-FOR-FF9B-9.0-9.5 (JC22855-16). It is also associated by batch QC with samples P4-FOR-FF9B-5.0-5.5 (JC22855-14), P4-FOR-FF9B-7.0-7.5 (JC22855-15), P4-FOR-Y12B-0.5-1.0 (JC22855-17), P4-FOR-Y12B-2.0-2.5 (JC22855-18), P4-FOR-Y12B-4.0-4.5 (JC22855-19), P4-FOR-Y12B-6.0-6.5 (JC22855-20) and P4-FOR-Y12B-6.5-7.0 (JC22855-21).

MS sample P4-FOR-CC10B-3.0-3.5 (JC22855-5)

For the MS on sample P4-FOR-CC10B-3.0-3.5, associated with the samples as noted above, the soluble and insoluble MS recoveries were 75.4% and 92.0%, respectively; which met the quality control criteria of 75-125%. The post digestion spike (PDS) recovery was 96%, which met the PDS criteria of 85-115%. No data qualification was required on the basis of spike recoveries.

MS sample P4-FOR-FF9B-3.0-3.5 (JC22855-12)

Sample P4-FOR-FF9B-3.0-3.5, associated with samples as noted above, was selected for the soil matrix spike analysis and used for supporting data quality recommendations. The soluble and insoluble MS recoveries from the initial batch were 21.1% and 101.5%, respectively. The soluble MS recovery did not meet quality control (QC) criteria of 75-125%R. The PDS recovery was 88%, which met the PDS criteria of 85-115%.

Based on poor MS recoveries, less than 75%R, the MS and associated samples were reanalyzed using Method 7196. The soluble and insoluble matrix spike recoveries from the re-analysis were 23.1% and 70.8%, respectively. The soluble and insoluble MS recoveries did not meet the QC criteria of 75-125%R. The post spike result for the re-analysis batch was recovered at 65% and after pH adjustment was 79%, which did not meet the PDS criteria of 85-115%.

Since the soluble and/or insoluble MS recoveries were outside the acceptable QC limit of 75-125%, additional parameters were analyzed to determine if possible matrix interferences could be the cause for the poor matrix spike recoveries. All the soil samples were tested for pH and oxidation reduction potential (ORP) and plotted on an Eh/pH phase diagram chart. From this chart, the source sample for the matrix spike analysis was plotted below the phase change line, indicating reducing potential within the sample matrix, incapable of supporting hexavalent chromium. Analyses for ferrous iron, sulfide screen, and total organic carbon (TOC) were performed on the MS source sample to confirm the oxidizing/reducing potential within the sample matrix. The sulfide screen was reported as nondetect, indicating no reducing agents within the sample matrix; however, the ferrous iron (1.2 %) and the TOC results (13,500 concentration mg/Kg) were positive, indicating potential reducing agents within the sample matrix.

Since the MS recoveries from both the initial and reanalysis did not meet the MS QC requirements, but at least one MS recovery was greater than 50%, the highest detected hexavalent chromium result or the nondetect hexavalent chromium result with the lowest reporting limit (RL) was reported for each soil sample. The reported hexavalent chromium results in all the soil samples in this SDG were qualified as estimated (J/UJ) due to the poor MS recoveries.

No further qualification was taken based on the low reanalysis PDS recovery since the initial PDS %R was acceptable.

Field Duplicate Results

The field duplicate pair in this SDG was P4-FOR-FF9B-3.0-3.5 (JC22855-12) and P4-FOR-FF9B-3.0-3.5X (JC22855-13).

The reported (refer to MS section above) parent sample and field duplicate results were less than 4 times the RL. The absolute difference between the reported field duplicate results was greater than the absolute difference criteria of less than or equal to the RL; therefore; all reported hexavalent chromium soil results were qualified as estimated (J/UJ).

Sample Results

Reported results (flagged B by the laboratory) that were less than the reporting limit (RL), but greater than or equal to the method detection limit (MDL) are approximate values and have been qualified as estimated (J).

Data Quality and Usability

In general, these data appear to be valid and may be used for decision-making purposes. No data were rejected. Qualified results, if applicable, are presented in Attachments A and B.

The hexavalent chromium soil results in this SDG are usable as estimated values with the potential for low bias due to low soluble MS and or PDS recovery, and since the MS sample matrix appears to be reducing based on the Eh-pH plot and the presence of TOC and ferrous iron.

Sample results qualified due to field duplicate precision are usable as estimated values with an unknown directional bias.

Sample results reported between the MDL and RL are usable as estimated values with an unknown directional bias.

ATTACHMENTS

Attachment A: Target Analyte Summary Hitlist(s)

Attachment B: Data Validation Report Form

Attachment A

Target Analyte Summary Hitlist(s)

Soil Target Analyte Summary Hit List (Hexavalent Chromium)

Site Name PPG - Forrest PDI
Sampling Date June 23, 2016
Lab Name/ID SGS/Accutest, Dayton, NJ
SDG No JC22855 and JC22855R
Sample Matrix Soil
Trip Blank ID NA
Field Blank ID FOR-FB20160623

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
P4-FOR-CC10B-1.0-1.5	JC22855-2	CHROMIUM (HEXAVALENT)	U	7.4	7.4	0.43	Qualify	1,2
P4-FOR-CC10B-10.5-11.0	JC22855-3	CHROMIUM (HEXAVALENT)	U	138	138	4.8	Qualify	2
P4-FOR-CC10B-11.0-11.5	JC22855-4	CHROMIUM (HEXAVALENT)	U	4.5	4.5	0.49	Qualify	2
P4-FOR-CC10B-3.0-3.5	JC22855-5	CHROMIUM (HEXAVALENT)	U	0.47B	0.47	0.48	Qualify	2,3
P4-FOR-CC10B-5.0-5.5	JC22855-6	CHROMIUM (HEXAVALENT)	U	1.2	1.2	0.47	Qualify	1,2
P4-FOR-CC10B-7.0-7.5	JC22855-7	CHROMIUM (HEXAVALENT)	U	U	U	0.48	Qualify	2
P4-FOR-CC10B-9.0-9.5	JC22855-8	CHROMIUM (HEXAVALENT)	U	33.8	33.8	0.48	Qualify	2
P4-FOR-FF9B-1.0-1.5	JC22855-9	CHROMIUM (HEXAVALENT)	U	1.6	1.6	0.43	Qualify	1,2
P4-FOR-FF9B-11.0-11.5	JC22855-10	CHROMIUM (HEXAVALENT)	U	4.3	4.3	0.48	Qualify	2
P4-FOR-FF9B-11.5-12.0	JC22855-11	CHROMIUM (HEXAVALENT)	U	U	U	0.49	Qualify	2
P4-FOR-FF9B-3.0-3.5	JC22855-12	CHROMIUM (HEXAVALENT)	U	1.3	1.3	0.49	Qualify	1,2
P4-FOR-FF9B-3.0-3.5X	JC22855-13R	CHROMIUM (HEXAVALENT)	U	0.52	0.52	0.47	Qualify	1,2
P4-FOR-FF9B-5.0-5.5	JC22855-14	CHROMIUM (HEXAVALENT)	U	1.1	1.1	0.49	Qualify	1,2
P4-FOR-FF9B-7.0-7.5	JC22855-15	CHROMIUM (HEXAVALENT)	U	0.77	0.77	0.50	Qualify	1,2
P4-FOR-FF9B-9.0-9.5	JC22855-16R	CHROMIUM (HEXAVALENT)	U	0.72	0.72	0.48	Qualify	1,2
P4-FOR-Y12B-0.5-1.0	JC22855-17R	CHROMIUM (HEXAVALENT)	U	36.3	36.3	0.47	Qualify	1,2
P4-FOR-Y12B-2.0-2.5	JC22855-18	CHROMIUM (HEXAVALENT)	U	10.4	10.4	0.48	Qualify	1,2
P4-FOR-Y12B-4.0-4.5	JC22855-19R	CHROMIUM (HEXAVALENT)	U	19.2	19.2	0.47	Qualify	1,2

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
P4-FOR-Y12B-6.0-6.5	JC22855-20	CHROMIUM (HEXAVALENT)	U	U	U	0.50	Qualify	1,2
P4-FOR-Y12B-6.5-7.0	JC22855-21R	CHROMIUM (HEXAVALENT)	U	10.4	10.4	0.57	Qualify	1,2
P4-FOR-Y12B-7.0-7.5	JC22855-22	CHROMIUM (HEXAVALENT)	U	1.0	1.0	0.49	Qualify	2

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

NJDEP Laboratory Footnote

1. The reported value was qualified because the soluble and/or insoluble matrix recoveries were less than 75%, but greater than 50%.
2. In the Field Duplicate Sample Analysis, Hexavalent Chromium fell outside the control limits of $\leq 20\%$ for sample results $> 4xRL$ or $+ RL$ for sample results $< 4xRL$. Therefore, the result was qualified.
3. The reported result was greater than the MDL but less than the RL and qualified (J) as estimated by the laboratory.

Attachment B

Data Validation Report Form

Client Name: PPG Industries	Project Number: 60314351.GA.DE.PDI.FOR
Site Location: PPG - Forrest PDI, Jersey City, NJ	Project Manager: Aimee Ruiter
Laboratory: SGS/Accutest, Dayton, NJ	Type of Validation: Full
Laboratory Job No: JC22855 and JC22855R	Date Checked: 08/29/2016
Validator: Charlene Livingston Flint	Peer: Mary Kozik

ITEM	YES	NO	N/A	COMMENTS
Sample results included?	X			
Reporting Limits met project requirements?	X			
Field I.D. included?	X			
Laboratory I.D. included?	X			
Did data package sample IDs match sample IDs on COC?	X			
Did electronic data deliverable (EDD) sample IDs match COC sample IDs?	X			
Did data package sample IDs match electronic data deliverable (EDD) sample IDs?	X			
Sample matrix included?	X			
Sample receipt temperature 2-6°C?	X			4.0 °C
Signed COCs included?	X			
Date of sample collection included?	X			
Date of sample digestion included?	X			
Holding time to digestion met criteria? (Soils -30 days from collection to digestion.)	X			
Date of analysis included?	X			
Holding time to analysis met criteria? (Soils -168 hours from digestion to analysis; Aqueous - 24 hours from collection to analysis.)	X			
Method reference included?	X			
Laboratory Case Narrative included?	X			

Definitions: MDL - Method Detection Limit; %R - Percent Recovery; RL - Reporting Limit; RPD - Relative Percent Difference; RSD - Relative Standard Deviation ;Corr - Correlation Coefficient.

ITEM	YES	NO	N/A	COMMENTS
Initial calibration documentation included in lab package?	X			
1) Blank plus 4 standards (7196A) or blank plus 3 standards (7199)	X			
2) Correlation coefficient of =0.995 (7196A) or =0.999 (7199)	X			
3) Calibrate daily or each time instrument is set up.	X			
Calibration Check Standard (CCS) for 7196A and Quality Control Sample (QCS) for 7199 Included in Lab Package?	X			
1) %R criteria met? (90 - 110%)	X			
2) Correct frequency of one per every 10 samples	X			
3) CCS and QCS from independent source and at mid- level of calibration curve	X			
Calibration Blanks	X			
1) Analyzed prior to initial calibration standards and after each CCS/QCS?	X			
2) Absolute value should not exceed MDL.	X			
Method Blank, Field Blanks and/or Equipment Blanks Included in Lab Package?	X			
1) Method blank analyzed with each preparation batch?	X			
2) Absolute value should not exceed MDL.	X			
Eh and pH Data	X			
1) Eh and pH data was included and plotted for all samples?	X			
Soluble Matrix Spike Data Included in Lab Package?	X			2 Sets. JC22855-5 and JC22855-12, -12R
1) Soluble Matrix %R criteria met? (75-125%R).		X		See nonconformance tables. JC22855-5 met QC criteria.
2) Was the spike concentration 40 mg/Kg or twice the sample concentration?	X			Spiked at 48.8, 49.8 and 49.2 mg/kg.
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	X			
Insoluble Matrix Spike Data Included in Lab Package?	X			
1) Insoluble Matrix %R criteria met? (75-125%R).		X		See nonconformance tables. JC22855-12R did not meet QC criteria.
2) Was the spike concentration around 400 to 800 mg/Kg?		X		Spiked at 1020, 1230, and 914 mg/kg. No impact on data.
3) Was a sample spiked at the frequency of 1 per batch or 20	X			

samples?				
Post Digestion Spike	X			
1) Post Digestion Spike %R criteria met? (85-115%R).		X		JC22855-5 met QC limits.
2) Was the spike concentration 40 mg/Kg or twice the sample concentration?	X			
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	X			
Sample Duplicate Data Included in Lab Package?	X			JC22855-5, -12, -12R
1.) RPD criteria met? (RPD < 20%) if both results are $\geq 4x$ RL or control limit of \pm RL if both results are $< 4xRL$.	X			$< 4xRL$, Abs Diff $< RL$
2) Was a sample duplicate analyzed at the frequency of 1 per batch or 20 samples?	X			
Was a Laboratory Control Sample (LCS) Included in Lab Package?	X			
1) %R criteria met? (80-120%R).	X			
2) Was an LCS analyzed at the frequency of 1/batch or 20 samples?	X			
Were any Field Duplicate samples submitted with this SDG?	X			JC22855-5 & -6R
1) RPD criteria met? (RPD < 20%) if both results are $\geq 4x$ RL or control limit of \pm RL if both results are $< 4xRL$.		X		See nonconformance tables. NOTE: there were 21 soil samples in this SDG. Based on professional judgment, all were qualified.
Were all sample quantitation and reporting requirements met?	X			
1) Were all solid samples reported with percent solids > 50%?	X			
2) Were any samples analyzed or reported with dilutions?	X			JC22855-3 dil 1:10
Miscellaneous Items	X			
1) For soils by 7196A, was the pH within a range of 7.0-8.0?	X			
2) For soils by 7199, was the pH within a range of 9.0-9.5?			X	
3) For aqueous by 7196A, was the pH with a range of 1.5-2.5?	X			
4) For soils (3060A), was the digestion temperature 90-95C for at least 60 minutes?	X			
5) For 7199, was each sample injected twice and was the RPD ≤ 20 ?			X	

Matrix Spikes

Sample ID	Lab ID	Analyte	Matrix Spike	% Recovery	Lower Limit	Upper Limit	PDS %	PDS Limits %
P4-FOR-CC10B-3.0-3.5	JC22855-5	CHROMIUM (HEXAVALENT)	Soluble	75.4	75	125	96	85-115
P4-FOR-CC10B-3.0-3.5	JC22855-5	CHROMIUM (HEXAVALENT)	Insoluble	92.0	75	125		
P4-FOR-FF9B-3.0-3.5	JC22855-12	CHROMIUM (HEXAVALENT)	Insoluble	21.1	75	125	88	85-115
P4-FOR-FF9B-3.0-3.5	JC22855-12	CHROMIUM (HEXAVALENT)	Insoluble	101.5	75	125		
P4-FOR-FF9B-3.0-3.5	JC22855-12R	CHROMIUM (HEXAVALENT)	Insoluble	70.8	75	125	65, pH adjusted 79	85-115
P4-FOR-FF9B-3.0-3.5	JC22855-12R	CHROMIUM (HEXAVALENT)	Soluble	23.1	75	125		

Lab Duplicates

Sample ID	Lab ID	Analyte	Sample Result	Qual	Duplicate Result	Qual	QL	Units	RPD	Action
P4-FOR-FF9B-3.0-3.5	JC22855-12	CHROMIUM (HEXAVALENT)	1.3		1.1		0.49	mg/kg	16.7	OK
P4-FOR-FF9B-3.0-3.5	JC22855-12R	CHROMIUM (HEXAVALENT)	0.65		0.83		0.49	mg/kg	24.3	SR<4xRL, Abs Diff <RL, Accept
P4-FOR-FF9B-3.0-3.5	JC22855-5	CHROMIUM (HEXAVALENT)	0.47	B	0.51		0.48	mg/kg	8.2	OK

Field Duplicates

Sample ID	Duplicate ID	Analyte	Sample Result	Qual	Duplicate Result	Qual	QL	Units	RPD	Action
P4-FOR-FF9B-3.0-3.5	P4-FOR-FF9B-3.0-3.5X	CHROMIUM (HEXAVALENT)	1.3		0.47	U	0.49	mg/kg	200	SR <4xRL, Abs Diff >RL, Estimate (J/UJ)

Percent Solids

Sample ID	Percent Solids (%)	Status
P4-FOR-CC10B-1.0-1.5	92.1	ok @50%
P4-FOR-CC10B-10.5-11.0	83.7	ok @50%
P4-FOR-CC10B-11.0-11.5	82	ok @50%
P4-FOR-CC10B-3.0-3.5	83.6	ok @50%
P4-FOR-CC10B-5.0-5.5	85.4	ok @50%
P4-FOR-CC10B-7.0-7.5	83.8	ok @50%
P4-FOR-CC10B-9.0-9.5	83.3	ok @50%
P4-FOR-FF9B-1.0-1.5	93.8	ok @50%
P4-FOR-FF9B-11.0-11.5	83.6	ok @50%
P4-FOR-FF9B-11.5-12.0	81.7	ok @50%
P4-FOR-FF9B-3.0-3.5	81.9	ok @50%
P4-FOR-FF9B-3.0-3.5X	84.9	ok @50%
P4-FOR-FF9B-5.0-5.5	82	ok @50%
P4-FOR-FF9B-7.0-7.5	80.8	ok @50%
P4-FOR-FF9B-9.0-9.5	82.7	ok @50%
P4-FOR-Y12B-0.5-1.0	85.6	ok @50%
P4-FOR-Y12B-2.0-2.5	83.9	ok @50%
P4-FOR-Y12B-4.0-4.5	84.7	ok @50%
P4-FOR-Y12B-6.0-6.5	80.4	ok @50%
P4-FOR-Y12B-6.5-7.0	70.1	ok @50%
P4-FOR-Y12B-7.0-7.5	82.3	ok @50%

SDG#: JC22855/ Method 7196

Batch: GN48572

Cr+6 ICAL 7/6/16

Soil

(p. 116 of data pkg)

x - concentration	y - response
0	0
0.01	0.009
0.05	0.04
0.1	0.081
0.3	0.254
0.5	0.411
0.8	0.684
1	0.823

(p. 116 of data pkg)

AECOM Calculated Offset	-0.00005	OK	Reported Offset	-0.00005
AECOM Slope	0.8342	OK	Reported Slope	0.8342
AECOM Calculated r	0.99968	OK	Reported r	0.99968

LCS calculation

GP98717-B1 P. 76,116

Background Absorbance	0
Total absorbance	0.703
Total absorbance - background	0.703
Instrument Concentration	0.843
Sample weight (mg/kg)	0.0025
Final Volume (L)	0.1
Dilution Factor	1

AECOM Calculated LCS Result (mg/Kg)	33.7	OK	Reported Result (mg/Kg)	33.7
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%R = Found/True*100

GP98717-B1 P. 76,116

True Value (mg/kg)	40
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AECOM Calculated %R	84.3	OK	Reported %R	84.3
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MS calculation

GP98717-S1 P. 78,79,116 JC22855-5

Background reading	0
Total absorbance	0.638
Total absorbance - background	0.638
Instrument Concentration	0.7649
Sample weight (mg/kg)	0.00245
Final Volume (L)	0.1
Percent solids	0.836
Dilution Factor	1

AECOM Calculated MS Result (mg/Kg)	37.3	OK	Reported Result (mg/Kg)	37.3
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%R = Found/True*100

GP98717-S1 P. 78,79,116 JC22855-5

True Value (mg/kg)	48.8
Native concentration (mg/Kg)	0.47

AECOM %R	75.6	OK, rounding	Reported %R	75.4
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Percent Solids

JC22855-5 P. 79 P4-FOR-CC10B-3.0-3.5

Empty dish weight=	27.64
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Wet weight= 34.83

Dry weight= 33.65

AECOM %solids =	83.6	OK	Reported %solids=	83.6
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Reporting Limit	JC22855-5	P. 16,79,116	P4-FOR-CC10B-3.0-3.5
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Low Standard 0.01

Initial weight (mg/kg) 0.00246

Final volume (L) 0.1

Percent solids 0.836

Dilution Factor 1

Reporting Limit	0.49	OK, rounding	Reported RL (mg/Kg)=	0.48
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Sample Calculations	JC22855-5	P. 16,79,116	P4-FOR-CC10B-3.0-3.5
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Background reading 0

Total absorbance 0.008

Total absorbance - background 0.008

Instrument Response 0.010

Sample weight (mg/kg) 0.00246

Final Volume (L) 0.1

Percent solids 0.836

Dilution Factor 1

AECOM Calculated Result (mg/Kg)	0.47	OK	Reported Result (mg/Kg)	0.47 B
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Associated with samples JC22855-2 through JC22855-11

SDG#: JC22855/ Method 7196

Batch: GN48559

Cr+6 ICAL 7/6/16

Soil

(p. 108 of data pkg)

X - concentration	y - response
0	0
0.01	0.01
0.05	0.042
0.1	0.085
0.3	0.236
0.5	0.409
0.8	0.679
1	0.817

(p. 108 of data pkg)

AECOM Calculated Offset	-0.0005	OK	Reported Offset	-0.0005
AECOM Slope	0.8269	OK	Reported Slope	0.8269
AECOM Calculated r	0.99960	OK	Reported r	0.99960

LCS calculation

GP98719-B1 P. 76,108

Background Absorbance	0
Total absorbance	0.766
Total absorbance - background	0.766
Instrument Concentration	0.927
Sample weight (mg/kg)	0.0025
Final Volume (L)	0.1
Dilution Factor	1

AECOM Calculated LCS Result (mg/Kg)	37.1	OK	Reported Result (mg/Kg)	37.1
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%R = Found/True*100

GP98719-B1 P. 76,108

True Value (mg/kg)	40
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AECOM Calculated %R	92.7	OK, rounding	Reported %R	92.8
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MS calculation

GP98798-S1 P. 78,80,108 JC22855-12

Background reading	0.008
Total absorbance	0.203
Total absorbance - background	0.195
Instrument Concentration	0.2365
Sample weight (mg/kg)	0.00245
Final Volume (L)	0.1
Percent solids	0.819
Dilution Factor	1

AECOM Calculated MS Result (mg/Kg)	11.8	OK	Reported Result (mg/Kg)	11.8
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%R = Found/True*100

GP98798-S1 P. 78,80,108 JC22855-12

True Value (mg/kg)	49.8
Native concentration (mg/Kg)	1.3

AECOM %R	21.1	OK	Reported %R	21.1
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Percent Solids

JC22855-12 P. 80 P4-FOR-FF9B-3.0-3.5

Empty dish weight=	17.86
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Wet weight= 25.75

Dry weight= 24.32

AECOM %solids =	81.9	OK	Reported %solids=	81.9
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Reporting Limit

JC22855-12

P. 23,80,108

P4-FOR-FF9B-3.0-3.5

Low Standard 0.01

Initial weight (mg/kg) 0.00252

Final volume (L) 0.1

Percent solids 0.819

Dilution Factor 1

Reporting Limit	0.48	OK, rounding	Reported RL (mg/Kg)=	0.49
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Sample Calculations

JC22855-12

P. 23,80,108

P4-FOR-FF9B-3.0-3.5

Background reading 0.003

Total absorbance 0.025

Total absorbance - background 0.022

Instrument Response 0.027

Sample weight (mg/kg) 0.00252

Final Volume (L) 0.1

Percent solids 0.819

Dilution Factor 1

AECOM Calculated Result (mg/Kg)	1.3	OK	Reported Result (mg/Kg)	1.3
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Associated with samples JC22855-12 through JC22855-22

Data Validation Report

Project:	PPG - Forrest PDI
Laboratory:	SGS/Accutest, Dayton, NJ
Laboratory Job No.:	JC22855A
Analysis/Method:	Volatile Organic Compounds (VOCs) by GCMS/SW-846 8260C Semivolatile Organic Compounds (SVOCs) by GCMS/SW-846 8270D TAL Metals SW-846 3010A/3050B/6010C/7470A/7471B
Validation Level:	Limited
Site Location/Address:	Garfield Avenue, Jersey City, NJ
AECOM Project No:	60314351.GA.DE.PDI.FOR
Prepared by:	Kristin Rutherford /AECOM Completed on: 08/30/2016
Reviewed by:	Mary Kozik/AECOM File Name: JC22855A_2016-08-29_DVReport-F

Introduction

The data were reviewed in accordance with the FSP-QAPP and the following NJDEP and / or Region 2 validation Standard Operating Procedure(s) (SOP):

- NJDEP Office of Data Quality SOP 5.A.16, Rev 1 (May 2002), Quality Assurance Data Validation of Analytical Deliverables for Inorganics (based on USEPA SW-846 Methods);
- ICP-AES Data Validation, SOP No. HW-3a Revision 0 (July 2015);
- Mercury and Cyanide Data Validation, SOP No. HW-3c Revision 0 (July 2015);
- Low/Medium Volatile Data Validation, SOP No. HW-33A Revision 0 (July 2015);
- Semivolatile Data Validation SOP No. HW-35A Revision 0 (June 2015).

The results of quality control data analyzed with site samples were used to assess the overall reliability of the data. The following qualifiers were used to identify data quality issues:

- U: Indicates the analyte was not detected in the sample above the sample reporting limit.
- J: Indicates the result was an estimated value; the associated numerical value was an approximate concentration of the analyte in the sample.
- UJ: Indicates the analyte was not detected above the reporting limit and the reporting limit was approximate.
- UB: The analyte concentration is less than or equal to three (3) times the concentration in the associated method/prep blank. The presence of the analyte in the sample is negated (UB) due to laboratory contamination.

- JB: The analyte concentration is greater than three (3) times, but less than or equal to ten (10) times the concentration in the associated method/prep blank. The presence of that analyte in the sample is considered "real". The concentration is quantitatively qualified (JB) due to method blank contamination.
- R: The sample result was rejected due to serious deficiencies; the presence or absence of the analyte could not be confirmed.
- RA: The sample result was rejected due to NJ specific data validation QC requirements; however, the result is usable for project objectives. Refer to the Data Quality and Usability section in this data validation report for further discussion.

Sample Information

The samples listed below were collected by AECOM on June 23, 2016 as part of the PPG - Forrest PDI sampling at Garfield Avenue, Jersey City, New Jersey. Only the samples and parameters listed below were validated.

Field ID	Laboratory ID	Matrix	Fraction
FOR-FB20160623 (Equipment Blank)	JC22855-1A	Aqueous	TAL Metals, SVOCs and VOCs
P4-FOR-CC10B-1.0-1.5	JC22855-2A	Soil	TAL Metals, SVOCs and VOCs
P4-FOR-CC10B-10.5-11.0	JC22855-3A	Soil	TAL Metals, SVOCs and VOCs
P4-FOR-CC10B-11.0-11.5	JC22855-4A	Soil	TAL Metals, SVOCs and VOCs
P4-FOR-CC10B-3.0-3.5	JC22855-5A	Soil	TAL Metals, SVOCs and VOCs
P4-FOR-CC10B-5.0-5.5	JC22855-6A	Soil	TAL Metals, SVOCs and VOCs
P4-FOR-CC10B-7.0-7.5	JC22855-7A	Soil	TAL Metals, SVOCs and VOCs
P4-FOR-CC10B-9.0-9.5	JC22855-8A	Soil	TAL Metals, SVOCs and VOCs
4-FOR-FF9B-1.0-1.5	JC22855-9A	Soil	TAL Metals, SVOCs and VOCs
P4-FOR-FF9B-11.0-11.5	JC22855-10A	Soil	TAL Metals, SVOCs and VOCs
P4-FOR-FF9B-11.5-12.0	JC22855-11A	Soil	TAL Metals, SVOCs and VOCs
P4-FOR-FF9B-3.0-3.5	JC22855-12A	Soil	TAL Metals, SVOCs and VOCs
P4-FOR-FF9B-3.0-3.5X (Field Duplicate of P4-FOR-FF9B-3.0-3.5)	JC22855-13A	Soil	TAL Metals, SVOCs and VOCs
P4-FOR-FF9B-5.0-5.5	JC22855-14A	Soil	TAL Metals, SVOCs and VOCs
P4-FOR-FF9B-7.0-7.5	JC22855-15A	Soil	TAL Metals, SVOCs and VOCs
P4-FOR-FF9B-9.0-9.5	JC22855-16A	Soil	TAL Metals, SVOCs and VOCs
P4-FOR-Y12B-0.5-1.0	JC22855-17A	Soil	TAL Metals, SVOCs and VOCs
P4-FOR-Y12B-2.0-2.5	JC22855-18A	Soil	TAL Metals, SVOCs and VOCs
P4-FOR-Y12B-4.0-4.5	JC22855-19A	Soil	TAL Metals, SVOCs and VOCs
P4-FOR-Y12B-6.0-6.5	JC22855-20A	Soil	TAL Metals, SVOCs and VOCs
P4-FOR-Y12B-6.5-7.0	JC22855-21A	Soil	TAL Metals, SVOCs and VOCs
P4-FOR-Y12B-7.0-7.5	JC22855-22A	Soil	TAL Metals, SVOCs and VOCs

The samples were collected following the procedures detailed in the Work Order for Garfield Avenue Remedial Action (GARA) at Garfield Avenue, Jersey City, NJ and the Field Sampling Plan/Quality

Assurance Project Plan for Non-Residential and Residential Chromium Sites Hudson County, New Jersey (December 2011).

General Comments

The data package was complete. Quality control (QC) issues identified during validation are discussed below. Refer to the Target Analyte Summary Hit(s) in Attachment A for a listing of all detected results, qualified results, and associated qualifications, where applicable. The nonconformances for each section discussed below are presented in Attachment B.

TAL Metals

Laboratory Blanks/Equipment Blanks

Aluminum, calcium, chromium, iron, and manganese were detected in the method blank (MB) associated with all soil samples *except* P4-FOR-Y12B-7.0-7.5 in this data set. These compounds were detected in the associated soil samples at concentrations greater than ten times the amount in the method blank; therefore, no qualifications were made.

Aluminum, beryllium, calcium, iron, lead, manganese, and zinc were detected in the method blank associated with soil sample P4-FOR-Y12B-7.0-7.5 in this data set. These compounds were detected in the associated soil sample at concentrations greater than ten times the amount in the method blank; therefore, no qualifications were made.

Mercury was detected in the method blank associated with all soil samples *except* P4-FOR-Y12B-7.0-7.5 in this data set. Mercury was detected in associated soil samples P4-FOR-CC10B-10.5-11.0, P4-FOR-CC10B-11.0-11.5, P4-FOR-CC10B-9.0-9.5, and P4-FOR-FF9B-9.0-9.5 at a concentration less than three times the MB; therefore, the results were negated (UB) at the reporting limit (RL). Mercury was detected in associated soil samples P4-FOR-CC10B-5.0-5.5, P4-FOR-FF9B-1.0-1.5, and P4-FOR-FF9B-11.0-11.5 at a concentration greater than three times, but less than ten times the MB contamination; therefore, the results were qualified (JB) as estimated and may be biased high. No qualifications were required for sample results greater than ten times the amount in the method blank.

Sodium was detected in the method blank associated with the aqueous equipment blank, FOR-FB20160623. The result for sodium in FOR-FB20160623 was greater than three times, but less than ten times the equipment blank contamination; therefore, the result was qualified (JB) as estimated.

Negative instrument drift was detected for silver in the method blank associated with all soil samples *except* P4-FOR-Y12B-7.0-7.5 in this data set. The nondetect results for silver in samples P4-FOR-CC10B-10.5-11.0, P4-FOR-CC10B-11.0-11.5, P4-FOR-CC10B-3.0-3.5, P4-FOR-CC10B-9.0-9.5, P4-FOR-FF9B-11.0-11.5, P4-FOR-FF9B-11.5-12.0, P4-FOR-FF9B-9.0-9.5, P4-FOR-Y12B-4.0-4.5, and P4-FOR-Y12B-6.5-7.0 were qualified as estimated (UJ) and may be biased low. The results for silver that were less than ten times the negative instrument drift in samples P4-FOR-CC10B-1.0-1.5, P4-FOR-CC10B-5.0-5.5, P4-FOR-CC10B-7.0-7.5, P4-FOR-FF9B-3.0-3.5, P4-FOR-FF9B-3.0-3.5X, P4-FOR-FF9B-5.0-5.5, P4-FOR-FF9B-7.0-7.5, P4-FOR-Y12B-0.5-1.0, P4-FOR-Y12B-2.0-2.5, and P4-FOR-Y12B-6.0-6.5 were qualified as estimated (J) and may be biased low.

Barium, calcium, manganese, nickel, sodium, and zinc were detected in the equipment blank, FOR-FB20160623, associated with the soil samples in this data set. Sodium was detected in samples P4-FOR-CC10B-11.0-11.5, P4-FOR-CC10B-7.0-7.5, P4-FOR-CC10B-9.0-9.5, P4-FOR-FF9B-11.0-11.5, P4-FOR-FF9B-11.5-12.0, and P4-FOR-FF9B-9.0-9.5 at a concentration greater than three times, but less than ten times the contamination in the equipment blank; therefore, the results were qualified (J) as estimated and may be biased high. Barium, calcium, manganese, nickel, and zinc were detected

in the associated samples at concentrations greater than ten times the amount in the equipment blank; therefore, no qualifications were made.

Refer to the Target Analyte Summary Hit(s) in Attachment A for a listing of all results qualified on the basis of method and equipment blank contamination. Refer to the nonconformance tables in Appendix B for a listing of blank results and associated qualification actions.

Matrix Spikes

Sample P4-FOR-CC10B-3.0-3.5 was analyzed as the matrix spike/matrix spike duplicate (MS/MSD) associated with all soil samples except P4-FOR-Y12B-7.0-7.5 in this data set. The recovery (%R) of aluminum was above quality control (QC) criteria; therefore, the results for aluminum in all soil samples *except* P4-FOR-Y12B-7.0-7.5 were qualified (J) as estimated and may be biased high. The recovery of antimony was below QC criteria; therefore, the results for antimony in the associated soil samples were qualified as estimated (J/UJ) and may be biased low. The recovery of iron was below QC criteria in the MS and above QC criteria in the MSD; therefore, the results for iron in the associated soil samples were qualified (J/UJ) as estimated with unknown direction of bias.

Field Duplicates

Samples P4-FOR-FF9B-3.0-3.5 and P4-FOR-FF9B-3.0-3.5X were collected as a field duplicate pair from this site. The relative percent difference (RPD) between the parent sample result and the field duplicate result did not meet criteria for mercury; therefore, the results for mercury in all soil samples in this SDG were qualified (J/UJ) as estimated with unknown directional bias.

Sample Results

The nondetect result for thallium in sample P4-FOR-FF9B-1.0-1.5 exceeded the NJDEP Default Impact to Ground Water Soil Screening Level (DIGWSSL) and the Residential Direct Contact Soil Remediation Standard (RDCSRS) levels; therefore, the nondetect result may not meet project objectives. Refer to the nonconformance tables in Appendix B for a listing of results exceeding the NJDEP DIGWSSL and RDCSRS criteria.

Reported results (flagged B by the laboratory) that were less than the RL, but greater than or equal to the MDL, are approximate values and have been qualified as estimated (J).

VOCs

Matrix Spikes

Sample P4-FOR-CC10B-3.0-3.5 was analyzed as the MS/MSD in this data set. The %R of methyl tert-butyl ether was below QC criteria; therefore, the nondetect result in parent sample P4-FOR-CC10B-3.0-3.5 was qualified (UJ) as estimated and may be biased low. The %R of methyl acetate was above QC criteria and RPD was outside QC criteria. Since the result for methyl acetate in the spiked sample was nondetect, no qualifications were required. The RPD of 2-hexanone was outside QC criteria; however, since the result in the parent sample was nondetect, no qualification was required.

Field Duplicates

Samples P4-FOR-FF9B-3.0-3.5 and P4-FOR-FF9B-3.0-3.5X were collected as a field duplicate pair from this site. The RPD between the parent sample result and the field duplicate result did not meet criteria for 1,2-dichlorobenzene; therefore, the result for 1,2-dichlorobenzene the field duplicate pair were qualified (J) as estimated with unknown directional bias.

Sample Results

The nondetect results for several VOCs exceeded the NJDEP DIGWSSL and/or the RDCSRS levels; therefore, the nondetect results may not meet project objectives. Refer to the nonconformance tables in Appendix B for a listing of results exceeding the NJDEP DIGWSSL and RDCSRS criteria.

Reported results (flagged J by the laboratory) that were less than the RL, but greater than or equal to the MDL, are approximate values and have been qualified as estimated (J).

SVOCs

Laboratory Control Sample

The recoveries of acenaphthylene, carbazole and 4-nitroaniline were above the QC criteria in the laboratory control sample (LCS) associated with all soil samples *except* P4-FOR-FF9B-9.0-9.5 and P4-FOR-Y12B-6.5-7.0. The positive results for acenaphthylene in samples P4-FOR-CC10B-1.0-1.5, P4-FOR-CC10B-10.5-11.0, P4-FOR-CC10B-3.0-3.5, P4-FOR-CC10B-5.0-5.5, P4-FOR-CC10B-7.0-7.5, P4-FOR-FF9B-1.0-1.5, P4-FOR-FF9B-11.0-11.5, P4-FOR-FF9B-3.0-3.5, P4-FOR-FF9B-3.0-3.5X, P4-FOR-FF9B-5.0-5.5, P4-FOR-FF9B-7.0-7.5, P4-FOR-Y12B-0.5-1.0, P4-FOR-Y12B-2.0-2.5, P4-FOR-Y12B-4.0-4.5, and P4-FOR-Y12B-6.0-6.5 were qualified (J) as estimated and may be biased high. The positive results for carbazole in samples P4-FOR-CC10B-1.0-1.5, P4-FOR-FF9B-1.0-1.5, P4-FOR-FF9B-3.0-3.5, P4-FOR-FF9B-3.0-3.5X, P4-FOR-FF9B-5.0-5.5, P4-FOR-Y12B-0.5-1.0, P4-FOR-Y12B-2.0-2.5, and P4-FOR-Y12B-4.0-4.5 were qualified (J) as estimated and may be biased high.

Since the bias was high for these compounds, no qualifications were required for nondetect results for acenaphthylene, carbazole and 4-nitroaniline in the associated soil samples.

Refer to the Target Analyte Summary Hit(s) in Attachment A for a listing of all results qualified on the basis of LCS results. Refer to the nonconformance tables in Appendix B for a listing of LCS results and associated qualification actions.

Field Duplicates

Samples P4-FOR-FF9B-3.0-3.5 and P4-FOR-FF9B-3.0-3.5X were collected as a field duplicate pair from this site. The RPD between the parent sample result and the field duplicate result did not meet criteria for naphthalene; therefore, the results for naphthalene the field duplicate pair were qualified (J) as estimated with unknown directional bias.

Sample Results

The nondetect result for 2,4-dinitrophenol in sample P4-FOR-Y12B-6.0-6.5 exceeded the NJDEP DIGWSSL; therefore, the nondetect result may not meet project objectives. Refer to the nonconformance tables in Appendix B for a listing of results exceeding the NJDEP DIGWSSL criteria.

Reported results (flagged J by the laboratory) that were less than the reporting limit (RL), but greater than or equal to the method detection limit (MDL) are approximate values and have been qualified as estimated (J).

Data Quality and Usability

In general, these data appear to be valid and may be used for decision-making purposes. No data were rejected. Qualified results are presented in Attachments A and B.

The following issues were noted for this sample set:

- The results for mercury in samples P4-FOR-CC10B-10.5-11.0, P4-FOR-CC10B-11.0-11.5, P4-FOR-CC10B-9.0-9.5, and P4-FOR-FF9B-9.0-9.5 are usable as nondetect results due to method blank contamination.
- The results for mercury in samples P4-FOR-CC10B-5.0-5.5, P4-FOR-FF9B-1.0-1.5, and P4-FOR-FF9B-11.0-11.5 are usable as estimated results that may be biased high due to method blank contamination.
- The result for sodium in equipment blank FOR-FB20160623 is usable as an estimated result that may be biased high due to method blank contamination.
- The results for sodium in samples P4-FOR-CC10B-11.0-11.5, P4-FOR-CC10B-7.0-7.5, P4-FOR-CC10B-9.0-9.5, P4-FOR-FF9B-11.0-11.5, P4-FOR-FF9B-11.5-12.0, and P4-FOR-FF9B-9.0-9.5 are usable as estimated results that may be biased high due to equipment blank contamination.
- The results for silver in all samples *except P4-FOR-FF9B-1.0-1.5* are usable as estimated results that may be biased low due to negative instrument drift.
- The results for aluminum in all soil samples *except P4-FOR-Y12B-7.0-7.5* are usable as estimated results that may be biased high due to high MS/MSD recoveries.
- The results for antimony in all soil samples *except P4-FOR-Y12B-7.0-7.5* are usable as estimated results that may be biased low due to low MS/MSD recoveries.
- The results for iron in all soil samples *except P4-FOR-Y12B-7.0-7.5* are usable as estimated results with unknown direction of bias due to low MS and high MSD recoveries.
- The results for mercury in all soil samples are usable as estimated results with unknown direction of bias due to poor field duplicate precision.
- The nondetect result for methyl tert-butyl ether in sample P4-FOR-CC10B-3.0-3.5 is usable as an estimated result that may be biased low due to low MS recovery.
- The results for 1,2-dichlorobenzene and naphthalene in field duplicate samples P4-FOR-FF9B-3.0-3.5 and P4-FOR-FF9B-3.0-3.5X are usable as estimated results with unknown direction of bias due to poor field duplicate precision.
- The positive results for acenaphthylene and/or carbazole in several samples are usable as estimated results that may be biased high due to high LCS recovery.
- The nondetect results for selected metals, VOCs and SVOCs exceeded the NJDEP DIGWSSL and/or RDCSRS levels; therefore, the nondetect results may not meet project objectives.
- Sample results reported between the MDL and RL were estimated with an unknown directional bias.

ATTACHMENTS

Attachment A: Target Analyte Summary Hitlist(s)

Attachment B: Data Validation Report Form

Attachment A

Target Analyte Summary Hitlist(s)

Soil Target Analyte Summary Hit List (TAL Metals)

Site Name PPG-Forrest PDI
Sampling Date June 23, 2016
Lab Name/ID SGS/Accutest, Dayton, NJ
SDG No JC22855A
Sample Matrix Soil
Trip Blank ID NA
Field Blank ID FOR-FB20160623

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
P4-FOR-FF9B-11.0-11.5	JC22855-10A	ALUMINUM	2.3	3350	3350	60	Qualify	6
P4-FOR-FF9B-11.5-12.0	JC22855-11A	ALUMINUM	2.3	3370	3370	59	Qualify	6
P4-FOR-FF9B-3.0-3.5	JC22855-12A	ALUMINUM	2.3	11900	11900	60	Qualify	6
P4-FOR-FF9B-3.0-3.5X	JC22855-13A	ALUMINUM	2.3	12900	12900	57	Qualify	6
P4-FOR-FF9B-5.0-5.5	JC22855-14A	ALUMINUM	2.3	8910	8910	61	Qualify	6
P4-FOR-FF9B-7.0-7.5	JC22855-15A	ALUMINUM	2.3	17300	17300	63	Qualify	6
P4-FOR-FF9B-9.0-9.5	JC22855-16A	ALUMINUM	2.3	2390	2390	59	Qualify	6
P4-FOR-Y12B-0.5-1.0	JC22855-17A	ALUMINUM	2.3	11700	11700	57	Qualify	6
P4-FOR-Y12B-2.0-2.5	JC22855-18A	ALUMINUM	2.3	3780	3780	58	Qualify	6
P4-FOR-Y12B-4.0-4.5	JC22855-19A	ALUMINUM	2.3	4890	4890	59	Qualify	6
P4-FOR-Y12B-6.0-6.5	JC22855-20A	ALUMINUM	2.3	5590	5590	59	Qualify	6
P4-FOR-Y12B-6.5-7.0	JC22855-21A	ALUMINUM	2.3	2930	2930	68	Qualify	6
P4-FOR-Y12B-7.0-7.5	JC22855-22A	ALUMINUM	5.2	15500	15500	59		
P4-FOR-CC10B-1.0-1.5	JC22855-2A	ALUMINUM	2.3	6320	6320	56	Qualify	6
P4-FOR-CC10B-10.5-11.0	JC22855-3A	ALUMINUM	2.3	5070	5070	39	Qualify	6
P4-FOR-CC10B-11.0-11.5	JC22855-4A	ALUMINUM	2.3	4940	4940	59	Qualify	6
P4-FOR-CC10B-3.0-3.5	JC22855-5A	ALUMINUM	2.3	7800	7800	59	Qualify	6

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
P4-FOR-CC10B-5.0-5.5	JC22855-6A	ALUMINUM	2.3	6400	6400	57	Qualify	6
P4-FOR-CC10B-7.0-7.5	JC22855-7A	ALUMINUM	2.3	4460	4460	60	Qualify	6
P4-FOR-CC10B-9.0-9.5	JC22855-8A	ALUMINUM	2.3	1300	1300	61	Qualify	6
P4-FOR-FF9B-1.0-1.5	JC22855-9A	ALUMINUM	2.3	4470	4470	51	Qualify	6
P4-FOR-FF9B-11.0-11.5	JC22855-10A	ANTIMONY	U	U	U	2.4	Qualify	7
P4-FOR-FF9B-11.5-12.0	JC22855-11A	ANTIMONY	U	U	U	2.4	Qualify	7
P4-FOR-FF9B-3.0-3.5	JC22855-12A	ANTIMONY	U	U	U	2.4	Qualify	7
P4-FOR-FF9B-3.0-3.5X	JC22855-13A	ANTIMONY	U	U	U	2.3	Qualify	7
P4-FOR-FF9B-5.0-5.5	JC22855-14A	ANTIMONY	U	U	U	2.4	Qualify	7
P4-FOR-FF9B-7.0-7.5	JC22855-15A	ANTIMONY	U	U	U	2.5	Qualify	7
P4-FOR-FF9B-9.0-9.5	JC22855-16A	ANTIMONY	U	U	U	2.4	Qualify	7
P4-FOR-Y12B-0.5-1.0	JC22855-17A	ANTIMONY	U	0.44B	0.44	2.3	Qualify	7
P4-FOR-Y12B-2.0-2.5	JC22855-18A	ANTIMONY	U	0.83B	0.83	2.3	Qualify	7
P4-FOR-Y12B-4.0-4.5	JC22855-19A	ANTIMONY	U	0.86B	0.86	2.4	Qualify	7
P4-FOR-Y12B-6.0-6.5	JC22855-20A	ANTIMONY	U	1.2B	1.2	4.7	Qualify	7
P4-FOR-Y12B-6.5-7.0	JC22855-21A	ANTIMONY	U	U	U	2.7	Qualify	7
P4-FOR-Y12B-7.0-7.5	JC22855-22A	ANTIMONY	U	0.57B	0.57	2.4	Qualify	1
P4-FOR-CC10B-1.0-1.5	JC22855-2A	ANTIMONY	U	U	U	2.2	Qualify	7
P4-FOR-CC10B-10.5-11.0	JC22855-3A	ANTIMONY	U	U	U	1.6	Qualify	7
P4-FOR-CC10B-11.0-11.5	JC22855-4A	ANTIMONY	U	U	U	2.4	Qualify	7
P4-FOR-CC10B-3.0-3.5	JC22855-5A	ANTIMONY	U	U	U	2.4	Qualify	7
P4-FOR-CC10B-5.0-5.5	JC22855-6A	ANTIMONY	U	U	U	2.3	Qualify	7
P4-FOR-CC10B-7.0-7.5	JC22855-7A	ANTIMONY	U	U	U	2.4	Qualify	7
P4-FOR-CC10B-9.0-9.5	JC22855-8A	ANTIMONY	U	U	U	2.4	Qualify	7
P4-FOR-FF9B-1.0-1.5	JC22855-9A	ANTIMONY	U	U	U	2.0	Qualify	7

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P4-FOR-FF9B-11.0-11.5	JC22855-10A	ARSENIC	U	3.9	3.9	2.4		
P4-FOR-FF9B-11.5-12.0	JC22855-11A	ARSENIC	U	2.0B	2.0	2.4	Qualify	1
P4-FOR-FF9B-3.0-3.5	JC22855-12A	ARSENIC	U	5.5	5.5	2.4		
P4-FOR-FF9B-3.0-3.5X	JC22855-13A	ARSENIC	U	6.4	6.4	2.3		
P4-FOR-FF9B-5.0-5.5	JC22855-14A	ARSENIC	U	11.5	11.5	2.4		
P4-FOR-FF9B-7.0-7.5	JC22855-15A	ARSENIC	U	7.5	7.5	2.5		
P4-FOR-FF9B-9.0-9.5	JC22855-16A	ARSENIC	U	1.2B	1.2	2.4	Qualify	1
P4-FOR-Y12B-0.5-1.0	JC22855-17A	ARSENIC	U	14.0	14.0	2.3		
P4-FOR-Y12B-2.0-2.5	JC22855-18A	ARSENIC	U	15.4	15.4	2.3		
P4-FOR-Y12B-4.0-4.5	JC22855-19A	ARSENIC	U	17.4	17.4	2.4		
P4-FOR-Y12B-6.0-6.5	JC22855-20A	ARSENIC	U	22.4	22.4	2.4		
P4-FOR-Y12B-6.5-7.0	JC22855-21A	ARSENIC	U	4.5	4.5	2.7		
P4-FOR-Y12B-7.0-7.5	JC22855-22A	ARSENIC	U	2.8	2.8	2.4		
P4-FOR-CC10B-1.0-1.5	JC22855-2A	ARSENIC	U	4.0	4.0	2.2		
P4-FOR-CC10B-10.5-11.0	JC22855-3A	ARSENIC	U	4.7	4.7	1.6		
P4-FOR-CC10B-11.0-11.5	JC22855-4A	ARSENIC	U	4.4	4.4	2.4		
P4-FOR-CC10B-3.0-3.5	JC22855-5A	ARSENIC	U	2.7	2.7	2.4		
P4-FOR-CC10B-5.0-5.5	JC22855-6A	ARSENIC	U	4.2	4.2	2.3		
P4-FOR-CC10B-7.0-7.5	JC22855-7A	ARSENIC	U	5.5	5.5	2.4		
P4-FOR-CC10B-9.0-9.5	JC22855-8A	ARSENIC	U	1.4B	1.4	2.4	Qualify	1
P4-FOR-FF9B-1.0-1.5	JC22855-9A	ARSENIC	U	7.9	7.9	2.0		
P4-FOR-FF9B-11.0-11.5	JC22855-10A	BARIUM	U	218	218	24		
P4-FOR-FF9B-11.5-12.0	JC22855-11A	BARIUM	U	17.3B	17.3	24	Qualify	1
P4-FOR-FF9B-3.0-3.5	JC22855-12A	BARIUM	U	49.7	49.7	24		
P4-FOR-FF9B-3.0-3.5X	JC22855-13A	BARIUM	U	56.2	56.2	23		

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P4-FOR-FF9B-5.0-5.5	JC22855-14A	BARIUM	U	69.0	69.0	24		
P4-FOR-FF9B-7.0-7.5	JC22855-15A	BARIUM	U	160	160	25		
P4-FOR-FF9B-9.0-9.5	JC22855-16A	BARIUM	U	9.2B	9.2	24	Qualify	1
P4-FOR-Y12B-0.5-1.0	JC22855-17A	BARIUM	U	389	389	23		
P4-FOR-Y12B-2.0-2.5	JC22855-18A	BARIUM	U	77.3	77.3	23		
P4-FOR-Y12B-4.0-4.5	JC22855-19A	BARIUM	U	82.4	82.4	24		
P4-FOR-Y12B-6.0-6.5	JC22855-20A	BARIUM	U	116	116	24		
P4-FOR-Y12B-6.5-7.0	JC22855-21A	BARIUM	U	54.8	54.8	27		
P4-FOR-Y12B-7.0-7.5	JC22855-22A	BARIUM	U	26.1	26.1	24		
P4-FOR-CC10B-1.0-1.5	JC22855-2A	BARIUM	U	35.8	35.8	22		
P4-FOR-CC10B-10.5-11.0	JC22855-3A	BARIUM	U	29.5	29.5	16		
P4-FOR-CC10B-11.0-11.5	JC22855-4A	BARIUM	U	26.2	26.2	24		
P4-FOR-CC10B-3.0-3.5	JC22855-5A	BARIUM	U	29.5	29.5	24		
P4-FOR-CC10B-5.0-5.5	JC22855-6A	BARIUM	U	29.3	29.3	23		
P4-FOR-CC10B-7.0-7.5	JC22855-7A	BARIUM	U	27.9	27.9	24		
P4-FOR-CC10B-9.0-9.5	JC22855-8A	BARIUM	U	8.5B	8.5	24	Qualify	1
P4-FOR-FF9B-1.0-1.5	JC22855-9A	BARIUM	U	31.6	31.6	20		
P4-FOR-FF9B-11.0-11.5	JC22855-10A	BERYLLIUM	U	0.19B	0.19	0.24	Qualify	1
P4-FOR-FF9B-11.5-12.0	JC22855-11A	BERYLLIUM	U	0.33	0.33	0.24		
P4-FOR-FF9B-3.0-3.5	JC22855-12A	BERYLLIUM	U	0.59	0.59	0.24		
P4-FOR-FF9B-3.0-3.5X	JC22855-13A	BERYLLIUM	U	0.71	0.71	0.23		
P4-FOR-FF9B-5.0-5.5	JC22855-14A	BERYLLIUM	U	0.50	0.50	0.24		
P4-FOR-FF9B-7.0-7.5	JC22855-15A	BERYLLIUM	U	0.94	0.94	0.25		
P4-FOR-FF9B-9.0-9.5	JC22855-16A	BERYLLIUM	U	0.12B	0.12	0.24	Qualify	1
P4-FOR-Y12B-0.5-1.0	JC22855-17A	BERYLLIUM	U	0.62	0.62	0.23		

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P4-FOR-Y12B-2.0-2.5	JC22855-18A	BERYLLIUM	U	0.47	0.47	0.23		
P4-FOR-Y12B-4.0-4.5	JC22855-19A	BERYLLIUM	U	0.59	0.59	0.24		
P4-FOR-Y12B-6.0-6.5	JC22855-20A	BERYLLIUM	U	0.60	0.60	0.24		
P4-FOR-Y12B-6.5-7.0	JC22855-21A	BERYLLIUM	U	0.27	0.27	0.27		
P4-FOR-Y12B-7.0-7.5	JC22855-22A	BERYLLIUM	0.029	0.46	0.46	0.24		
P4-FOR-CC10B-1.0-1.5	JC22855-2A	BERYLLIUM	U	0.27	0.27	0.22		
P4-FOR-CC10B-10.5-11.0	JC22855-3A	BERYLLIUM	U	0.32	0.32	0.16		
P4-FOR-CC10B-11.0-11.5	JC22855-4A	BERYLLIUM	U	0.43	0.43	0.24		
P4-FOR-CC10B-3.0-3.5	JC22855-5A	BERYLLIUM	U	0.40	0.40	0.24		
P4-FOR-CC10B-5.0-5.5	JC22855-6A	BERYLLIUM	U	0.37	0.37	0.23		
P4-FOR-CC10B-7.0-7.5	JC22855-7A	BERYLLIUM	U	0.24	0.24	0.24		
P4-FOR-CC10B-9.0-9.5	JC22855-8A	BERYLLIUM	U	0.073B	0.073	0.24	Qualify	1
P4-FOR-FF9B-1.0-1.5	JC22855-9A	BERYLLIUM	U	1.6B	1.6	2.0	Qualify	1
P4-FOR-FF9B-11.0-11.5	JC22855-10A	CADMIUM	U	0.085B	0.085	0.60	Qualify	1
P4-FOR-FF9B-11.5-12.0	JC22855-11A	CADMIUM	U	0.082B	0.082	0.59	Qualify	1
P4-FOR-FF9B-3.0-3.5	JC22855-12A	CADMIUM	U	0.28B	0.28	0.60	Qualify	1
P4-FOR-FF9B-3.0-3.5X	JC22855-13A	CADMIUM	U	0.53B	0.53	0.57	Qualify	1
P4-FOR-FF9B-5.0-5.5	JC22855-14A	CADMIUM	U	0.23B	0.23	0.61	Qualify	1
P4-FOR-FF9B-7.0-7.5	JC22855-15A	CADMIUM	U	0.13B	0.13	0.63	Qualify	1
P4-FOR-Y12B-0.5-1.0	JC22855-17A	CADMIUM	U	1.0	1.0	0.57		
P4-FOR-Y12B-2.0-2.5	JC22855-18A	CADMIUM	U	1.4	1.4	1.2		
P4-FOR-Y12B-4.0-4.5	JC22855-19A	CADMIUM	U	0.68	0.68	0.59		
P4-FOR-Y12B-6.0-6.5	JC22855-20A	CADMIUM	U	1.4	1.4	0.59		
P4-FOR-Y12B-6.5-7.0	JC22855-21A	CADMIUM	U	0.12B	0.12	0.68	Qualify	1
P4-FOR-Y12B-7.0-7.5	JC22855-22A	CADMIUM	U	0.083B	0.083	0.59	Qualify	1

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P4-FOR-CC10B-1.0-1.5	JC22855-2A	CADMIUM	U	0.18B	0.18	0.56	Qualify	1
P4-FOR-CC10B-10.5-11.0	JC22855-3A	CADMIUM	U	0.14B	0.14	0.39	Qualify	1
P4-FOR-CC10B-5.0-5.5	JC22855-6A	CADMIUM	U	0.10B	0.10	0.57	Qualify	1
P4-FOR-CC10B-7.0-7.5	JC22855-7A	CADMIUM	U	0.060B	0.060	0.60	Qualify	1
P4-FOR-FF9B-1.0-1.5	JC22855-9A	CADMIUM	U	0.61	0.61	0.51		
P4-FOR-FF9B-11.0-11.5	JC22855-10A	CALCIUM METAL	2.7	9610	9610	600		
P4-FOR-FF9B-11.5-12.0	JC22855-11A	CALCIUM METAL	2.7	1100	1100	590		
P4-FOR-FF9B-3.0-3.5	JC22855-12A	CALCIUM METAL	2.7	622	622	600		
P4-FOR-FF9B-3.0-3.5X	JC22855-13A	CALCIUM METAL	2.7	715	715	570		
P4-FOR-FF9B-5.0-5.5	JC22855-14A	CALCIUM METAL	2.7	1740	1740	610		
P4-FOR-FF9B-7.0-7.5	JC22855-15A	CALCIUM METAL	2.7	989	989	630		
P4-FOR-FF9B-9.0-9.5	JC22855-16A	CALCIUM METAL	2.7	224B	224	590	Qualify	1
P4-FOR-Y12B-0.5-1.0	JC22855-17A	CALCIUM METAL	2.7	14800	14800	570		
P4-FOR-Y12B-2.0-2.5	JC22855-18A	CALCIUM METAL	2.7	4200	4200	580		
P4-FOR-Y12B-4.0-4.5	JC22855-19A	CALCIUM METAL	2.7	4050	4050	590		
P4-FOR-Y12B-6.0-6.5	JC22855-20A	CALCIUM METAL	2.7	26600	26600	590		
P4-FOR-Y12B-6.5-7.0	JC22855-21A	CALCIUM METAL	2.7	2570	2570	680		
P4-FOR-Y12B-7.0-7.5	JC22855-22A	CALCIUM METAL	7.2	568B	568	590	Qualify	1
P4-FOR-CC10B-1.0-1.5	JC22855-2A	CALCIUM METAL	2.7	7750	7750	560		
P4-FOR-CC10B-10.5-11.0	JC22855-3A	CALCIUM METAL	2.7	13800	13800	390		
P4-FOR-CC10B-11.0-11.5	JC22855-4A	CALCIUM METAL	2.7	5070	5070	590		
P4-FOR-CC10B-3.0-3.5	JC22855-5A	CALCIUM METAL	2.7	843	843	590		
P4-FOR-CC10B-5.0-5.5	JC22855-6A	CALCIUM METAL	2.7	1900	1900	570		
P4-FOR-CC10B-7.0-7.5	JC22855-7A	CALCIUM METAL	2.7	772	772	600		
P4-FOR-CC10B-9.0-9.5	JC22855-8A	CALCIUM METAL	2.7	6210	6210	610		

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P4-FOR-FF9B-1.0-1.5	JC22855-9A	CALCIUM METAL	2.7	2820	2820	510		
P4-FOR-FF9B-11.0-11.5	JC22855-10A	CHROMIUM	0.13	127	127	1.2		
P4-FOR-FF9B-11.5-12.0	JC22855-11A	CHROMIUM	0.13	7.2	7.2	1.2		
P4-FOR-FF9B-3.0-3.5	JC22855-12A	CHROMIUM	0.13	23.2	23.2	1.2		
P4-FOR-FF9B-3.0-3.5X	JC22855-13A	CHROMIUM	0.13	20.7	20.7	1.1		
P4-FOR-FF9B-5.0-5.5	JC22855-14A	CHROMIUM	0.13	167	167	1.2		
P4-FOR-FF9B-7.0-7.5	JC22855-15A	CHROMIUM	0.13	58.9	58.9	1.3		
P4-FOR-FF9B-9.0-9.5	JC22855-16A	CHROMIUM	0.13	21.2	21.2	1.2		
P4-FOR-Y12B-0.5-1.0	JC22855-17A	CHROMIUM	0.13	1090	1090	2.3		
P4-FOR-Y12B-2.0-2.5	JC22855-18A	CHROMIUM	0.13	422	422	1.2		
P4-FOR-Y12B-4.0-4.5	JC22855-19A	CHROMIUM	0.13	876	876	1.2		
P4-FOR-Y12B-6.0-6.5	JC22855-20A	CHROMIUM	0.13	1310	1310	2.4		
P4-FOR-Y12B-6.5-7.0	JC22855-21A	CHROMIUM	0.13	751	751	1.4		
P4-FOR-Y12B-7.0-7.5	JC22855-22A	CHROMIUM	U	21.3	21.3	1.2		
P4-FOR-CC10B-1.0-1.5	JC22855-2A	CHROMIUM	0.13	340	340	1.1		
P4-FOR-CC10B-10.5-11.0	JC22855-3A	CHROMIUM	0.13	687	687	0.78		
P4-FOR-CC10B-11.0-11.5	JC22855-4A	CHROMIUM	0.13	248	248	1.2		
P4-FOR-CC10B-3.0-3.5	JC22855-5A	CHROMIUM	0.13	16.9	16.9	1.2		
P4-FOR-CC10B-5.0-5.5	JC22855-6A	CHROMIUM	0.13	28.4	28.4	1.1		
P4-FOR-CC10B-7.0-7.5	JC22855-7A	CHROMIUM	0.13	644	644	1.2		
P4-FOR-CC10B-9.0-9.5	JC22855-8A	CHROMIUM	0.13	596	596	1.2		
P4-FOR-FF9B-1.0-1.5	JC22855-9A	CHROMIUM	0.13	111	111	10		
P4-FOR-FF9B-11.0-11.5	JC22855-10A	COBALT	U	1.7B	1.7	6.0	Qualify	1
P4-FOR-FF9B-11.5-12.0	JC22855-11A	COBALT	U	2.5B	2.5	5.9	Qualify	1
P4-FOR-FF9B-3.0-3.5	JC22855-12A	COBALT	U	7.1	7.1	6.0		

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P4-FOR-FF9B-3.0-3.5X	JC22855-13A	COBALT	U	7.6	7.6	5.7		
P4-FOR-FF9B-5.0-5.5	JC22855-14A	COBALT	U	8.9	8.9	6.1		
P4-FOR-FF9B-7.0-7.5	JC22855-15A	COBALT	U	41.3	41.3	6.3		
P4-FOR-FF9B-9.0-9.5	JC22855-16A	COBALT	U	0.83B	0.83	5.9	Qualify	1
P4-FOR-Y12B-0.5-1.0	JC22855-17A	COBALT	U	25.6	25.6	5.7		
P4-FOR-Y12B-2.0-2.5	JC22855-18A	COBALT	U	11.2	11.2	5.8		
P4-FOR-Y12B-4.0-4.5	JC22855-19A	COBALT	U	9.9	9.9	5.9		
P4-FOR-Y12B-6.0-6.5	JC22855-20A	COBALT	U	15.1	15.1	5.9		
P4-FOR-Y12B-6.5-7.0	JC22855-21A	COBALT	U	4.8B	4.8	6.8	Qualify	1
P4-FOR-Y12B-7.0-7.5	JC22855-22A	COBALT	U	4.8B	4.8	5.9	Qualify	1
P4-FOR-CC10B-1.0-1.5	JC22855-2A	COBALT	U	9.9	9.9	5.6		
P4-FOR-CC10B-10.5-11.0	JC22855-3A	COBALT	U	4.1	4.1	3.9		
P4-FOR-CC10B-11.0-11.5	JC22855-4A	COBALT	U	2.8B	2.8	5.9	Qualify	1
P4-FOR-CC10B-3.0-3.5	JC22855-5A	COBALT	U	3.6B	3.6	5.9	Qualify	1
P4-FOR-CC10B-5.0-5.5	JC22855-6A	COBALT	U	3.8B	3.8	5.7	Qualify	1
P4-FOR-CC10B-7.0-7.5	JC22855-7A	COBALT	U	3.1B	3.1	6.0	Qualify	1
P4-FOR-CC10B-9.0-9.5	JC22855-8A	COBALT	U	0.99B	0.99	6.1	Qualify	1
P4-FOR-FF9B-1.0-1.5	JC22855-9A	COBALT	U	4.0B	4.0	5.1	Qualify	1
P4-FOR-FF9B-11.0-11.5	JC22855-10A	COPPER	U	9.0	9.0	3.0		
P4-FOR-FF9B-11.5-12.0	JC22855-11A	COPPER	U	6.9	6.9	2.9		
P4-FOR-FF9B-3.0-3.5	JC22855-12A	COPPER	U	49.5	49.5	3.0		
P4-FOR-FF9B-3.0-3.5X	JC22855-13A	COPPER	U	35.4	35.4	2.8		
P4-FOR-FF9B-5.0-5.5	JC22855-14A	COPPER	U	65.1	65.1	3.0		
P4-FOR-FF9B-7.0-7.5	JC22855-15A	COPPER	U	69.8	69.8	3.1		
P4-FOR-FF9B-9.0-9.5	JC22855-16A	COPPER	U	4.3	4.3	3.0		

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
P4-FOR-Y12B-0.5-1.0	JC22855-17A	COPPER	U	180	180	2.8		
P4-FOR-Y12B-2.0-2.5	JC22855-18A	COPPER	U	162	162	5.8		
P4-FOR-Y12B-4.0-4.5	JC22855-19A	COPPER	U	83.6	83.6	3.0		
P4-FOR-Y12B-6.0-6.5	JC22855-20A	COPPER	U	138	138	3.0		
P4-FOR-Y12B-6.5-7.0	JC22855-21A	COPPER	U	30.8	30.8	3.4		
P4-FOR-Y12B-7.0-7.5	JC22855-22A	COPPER	U	14.5	14.5	2.9		
P4-FOR-CC10B-1.0-1.5	JC22855-2A	COPPER	U	67.9	67.9	2.8		
P4-FOR-CC10B-10.5-11.0	JC22855-3A	COPPER	U	10.7	10.7	2.0		
P4-FOR-CC10B-11.0-11.5	JC22855-4A	COPPER	U	7.4	7.4	3.0		
P4-FOR-CC10B-3.0-3.5	JC22855-5A	COPPER	U	10.6	10.6	3.0		
P4-FOR-CC10B-5.0-5.5	JC22855-6A	COPPER	U	18.8	18.8	2.9		
P4-FOR-CC10B-7.0-7.5	JC22855-7A	COPPER	U	19.8	19.8	3.0		
P4-FOR-CC10B-9.0-9.5	JC22855-8A	COPPER	U	3.6	3.6	3.0		
P4-FOR-FF9B-1.0-1.5	JC22855-9A	COPPER	U	63.4	63.4	2.5		
P4-FOR-FF9B-11.0-11.5	JC22855-10A	IRON	1.9	5080	5080	60	Qualify	8
P4-FOR-FF9B-11.5-12.0	JC22855-11A	IRON	1.9	6340	6340	59	Qualify	8
P4-FOR-FF9B-3.0-3.5	JC22855-12A	IRON	1.9	18300	18300	60	Qualify	8
P4-FOR-FF9B-3.0-3.5X	JC22855-13A	IRON	1.9	18000	18000	57	Qualify	8
P4-FOR-FF9B-5.0-5.5	JC22855-14A	IRON	1.9	23900	23900	61	Qualify	8
P4-FOR-FF9B-7.0-7.5	JC22855-15A	IRON	1.9	30800	30800	63	Qualify	8
P4-FOR-FF9B-9.0-9.5	JC22855-16A	IRON	1.9	3090	3090	59	Qualify	8
P4-FOR-Y12B-0.5-1.0	JC22855-17A	IRON	1.9	30300	30300	57	Qualify	8
P4-FOR-Y12B-2.0-2.5	JC22855-18A	IRON	1.9	46800	46800	120	Qualify	8
P4-FOR-Y12B-4.0-4.5	JC22855-19A	IRON	1.9	24900	24900	59	Qualify	8
P4-FOR-Y12B-6.0-6.5	JC22855-20A	IRON	1.9	23900	23900	59	Qualify	8

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P4-FOR-Y12B-6.5-7.0	JC22855-21A	IRON	1.9	7260	7260	68	Qualify	8
P4-FOR-Y12B-7.0-7.5	JC22855-22A	IRON	3.2	17900	17900	59		
P4-FOR-CC10B-1.0-1.5	JC22855-2A	IRON	1.9	15300	15300	56	Qualify	8
P4-FOR-CC10B-10.5-11.0	JC22855-3A	IRON	1.9	7710	7710	39	Qualify	8
P4-FOR-CC10B-11.0-11.5	JC22855-4A	IRON	1.9	8280	8280	59	Qualify	8
P4-FOR-CC10B-3.0-3.5	JC22855-5A	IRON	1.9	9590	9590	59	Qualify	8
P4-FOR-CC10B-5.0-5.5	JC22855-6A	IRON	1.9	8620	8620	57	Qualify	8
P4-FOR-CC10B-7.0-7.5	JC22855-7A	IRON	1.9	8140	8140	60	Qualify	8
P4-FOR-CC10B-9.0-9.5	JC22855-8A	IRON	1.9	1760	1760	61	Qualify	8
P4-FOR-FF9B-1.0-1.5	JC22855-9A	IRON	1.9	30800	30800	100	Qualify	8
P4-FOR-FF9B-11.0-11.5	JC22855-10A	LEAD	U	451	451	2.4		
P4-FOR-FF9B-11.5-12.0	JC22855-11A	LEAD	U	8.2	8.2	2.4		
P4-FOR-FF9B-3.0-3.5	JC22855-12A	LEAD	U	43.2	43.2	2.4		
P4-FOR-FF9B-3.0-3.5X	JC22855-13A	LEAD	U	42.8	42.8	2.3		
P4-FOR-FF9B-5.0-5.5	JC22855-14A	LEAD	U	154	154	2.4		
P4-FOR-FF9B-7.0-7.5	JC22855-15A	LEAD	U	97.4	97.4	2.5		
P4-FOR-FF9B-9.0-9.5	JC22855-16A	LEAD	U	12.0	12.0	2.4		
P4-FOR-Y12B-0.5-1.0	JC22855-17A	LEAD	U	410	410	2.3		
P4-FOR-Y12B-2.0-2.5	JC22855-18A	LEAD	U	139	139	4.7		
P4-FOR-Y12B-4.0-4.5	JC22855-19A	LEAD	U	187	187	2.4		
P4-FOR-Y12B-6.0-6.5	JC22855-20A	LEAD	U	331	331	2.4		
P4-FOR-Y12B-6.5-7.0	JC22855-21A	LEAD	U	33.5	33.5	2.7		
P4-FOR-Y12B-7.0-7.5	JC22855-22A	LEAD	0.65	7.9	7.9	2.4		
P4-FOR-CC10B-1.0-1.5	JC22855-2A	LEAD	U	286	286	2.2		
P4-FOR-CC10B-10.5-11.0	JC22855-3A	LEAD	U	53.1	53.1	1.6		

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P4-FOR-CC10B-11.0-11.5	JC22855-4A	LEAD	U	7.9	7.9	2.4		
P4-FOR-CC10B-3.0-3.5	JC22855-5A	LEAD	U	14.3	14.3	2.4		
P4-FOR-CC10B-5.0-5.5	JC22855-6A	LEAD	U	42.3	42.3	2.3		
P4-FOR-CC10B-7.0-7.5	JC22855-7A	LEAD	U	43.5	43.5	2.4		
P4-FOR-CC10B-9.0-9.5	JC22855-8A	LEAD	U	20.3	20.3	2.4		
P4-FOR-FF9B-1.0-1.5	JC22855-9A	LEAD	U	89.4	89.4	20		
P4-FOR-FF9B-11.0-11.5	JC22855-10A	MAGNESIUM	U	633	633	600		
P4-FOR-FF9B-11.5-12.0	JC22855-11A	MAGNESIUM	U	1600	1600	590		
P4-FOR-FF9B-3.0-3.5	JC22855-12A	MAGNESIUM	U	3590	3590	600		
P4-FOR-FF9B-3.0-3.5X	JC22855-13A	MAGNESIUM	U	3560	3560	570		
P4-FOR-FF9B-5.0-5.5	JC22855-14A	MAGNESIUM	U	2970	2970	610		
P4-FOR-FF9B-7.0-7.5	JC22855-15A	MAGNESIUM	U	2460	2460	630		
P4-FOR-FF9B-9.0-9.5	JC22855-16A	MAGNESIUM	U	106B	106	590	Qualify	1
P4-FOR-Y12B-0.5-1.0	JC22855-17A	MAGNESIUM	U	5660	5660	570		
P4-FOR-Y12B-2.0-2.5	JC22855-18A	MAGNESIUM	U	1440	1440	580		
P4-FOR-Y12B-4.0-4.5	JC22855-19A	MAGNESIUM	U	1800	1800	590		
P4-FOR-Y12B-6.0-6.5	JC22855-20A	MAGNESIUM	U	2800	2800	590		
P4-FOR-Y12B-6.5-7.0	JC22855-21A	MAGNESIUM	U	874	874	680		
P4-FOR-Y12B-7.0-7.5	JC22855-22A	MAGNESIUM	U	3100	3100	590		
P4-FOR-CC10B-1.0-1.5	JC22855-2A	MAGNESIUM	U	3380	3380	560		
P4-FOR-CC10B-10.5-11.0	JC22855-3A	MAGNESIUM	U	2060	2060	390		
P4-FOR-CC10B-11.0-11.5	JC22855-4A	MAGNESIUM	U	1950	1950	590		
P4-FOR-CC10B-3.0-3.5	JC22855-5A	MAGNESIUM	U	1710	1710	590		
P4-FOR-CC10B-5.0-5.5	JC22855-6A	MAGNESIUM	U	1820	1820	570		
P4-FOR-CC10B-7.0-7.5	JC22855-7A	MAGNESIUM	U	1060	1060	600		

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P4-FOR-CC10B-9.0-9.5	JC22855-8A	MAGNESIUM	U	404B	404	610	Qualify	1
P4-FOR-FF9B-1.0-1.5	JC22855-9A	MAGNESIUM	U	1640	1640	510		
P4-FOR-FF9B-11.0-11.5	JC22855-10A	MANGANESE	0.050	89.9	89.9	1.8		
P4-FOR-FF9B-11.5-12.0	JC22855-11A	MANGANESE	0.050	176	176	1.8		
P4-FOR-FF9B-3.0-3.5	JC22855-12A	MANGANESE	0.050	133	133	1.8		
P4-FOR-FF9B-3.0-3.5X	JC22855-13A	MANGANESE	0.050	139	139	1.7		
P4-FOR-FF9B-5.0-5.5	JC22855-14A	MANGANESE	0.050	276	276	1.8		
P4-FOR-FF9B-7.0-7.5	JC22855-15A	MANGANESE	0.050	180	180	1.9		
P4-FOR-FF9B-9.0-9.5	JC22855-16A	MANGANESE	0.050	26.2	26.2	1.8		
P4-FOR-Y12B-0.5-1.0	JC22855-17A	MANGANESE	0.050	303	303	1.7		
P4-FOR-Y12B-2.0-2.5	JC22855-18A	MANGANESE	0.050	295	295	1.8		
P4-FOR-Y12B-4.0-4.5	JC22855-19A	MANGANESE	0.050	178	178	1.8		
P4-FOR-Y12B-6.0-6.5	JC22855-20A	MANGANESE	0.050	207	207	1.8		
P4-FOR-Y12B-6.5-7.0	JC22855-21A	MANGANESE	0.050	196	196	2.0		
P4-FOR-Y12B-7.0-7.5	JC22855-22A	MANGANESE	0.078	134	134	1.8		
P4-FOR-CC10B-1.0-1.5	JC22855-2A	MANGANESE	0.050	167	167	1.7		
P4-FOR-CC10B-10.5-11.0	JC22855-3A	MANGANESE	0.050	152	152	1.2		
P4-FOR-CC10B-11.0-11.5	JC22855-4A	MANGANESE	0.050	105	105	1.8		
P4-FOR-CC10B-3.0-3.5	JC22855-5A	MANGANESE	0.050	102	102	1.8		
P4-FOR-CC10B-5.0-5.5	JC22855-6A	MANGANESE	0.050	144	144	1.7		
P4-FOR-CC10B-7.0-7.5	JC22855-7A	MANGANESE	0.050	94.3	94.3	1.8		
P4-FOR-CC10B-9.0-9.5	JC22855-8A	MANGANESE	0.050	28.7	28.7	1.8		
P4-FOR-FF9B-1.0-1.5	JC22855-9A	MANGANESE	0.050	14300	14300	30		
P4-FOR-FF9B-11.0-11.5	JC22855-10A	MERCURY	0.0085	0.053	0.053	0.040	Qualify	3,9
P4-FOR-FF9B-11.5-12.0	JC22855-11A	MERCURY	0.0085	U	U	0.039	Qualify	9

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P4-FOR-FF9B-3.0-3.5	JC22855-12A	MERCURY	0.0085	0.16	0.16	0.038	Qualify	9
P4-FOR-FF9B-3.0-3.5X	JC22855-13A	MERCURY	0.0085	0.45	0.45	0.038	Qualify	9
P4-FOR-FF9B-5.0-5.5	JC22855-14A	MERCURY	0.0085	0.36	0.36	0.037	Qualify	9
P4-FOR-FF9B-7.0-7.5	JC22855-15A	MERCURY	0.0085	0.24	0.24	0.037	Qualify	9
P4-FOR-FF9B-9.0-9.5	JC22855-16A	MERCURY	0.0085	0.019B	0.019	0.039	Negate, Qualify	2,9
P4-FOR-Y12B-0.5-1.0	JC22855-17A	MERCURY	0.0085	2.0	2.0	0.19	Qualify	9
P4-FOR-Y12B-2.0-2.5	JC22855-18A	MERCURY	0.0085	1.2	1.2	0.079	Qualify	9
P4-FOR-Y12B-4.0-4.5	JC22855-19A	MERCURY	0.0085	0.53	0.53	0.037	Qualify	9
P4-FOR-Y12B-6.0-6.5	JC22855-20A	MERCURY	0.0085	0.88	0.88	0.040	Qualify	9
P4-FOR-Y12B-6.5-7.0	JC22855-21A	MERCURY	0.0085	0.14	0.14	0.034	Qualify	9
P4-FOR-Y12B-7.0-7.5	JC22855-22A	MERCURY	U	0.036B	0.036	0.040	Qualify	9
P4-FOR-CC10B-1.0-1.5	JC22855-2A	MERCURY	0.0085	0.10	0.10	0.033	Qualify	9
P4-FOR-CC10B-10.5-11.0	JC22855-3A	MERCURY	0.0085	0.023B	0.023	0.036	Negate, Qualify	2,9
P4-FOR-CC10B-11.0-11.5	JC22855-4A	MERCURY	0.0085	0.012B	0.012	0.038	Negate, Qualify	2,9
P4-FOR-CC10B-3.0-3.5	JC22855-5A	MERCURY	0.0085	0.10	0.10	0.037	Qualify	9
P4-FOR-CC10B-5.0-5.5	JC22855-6A	MERCURY	0.0085	0.063	0.063	0.038	Qualify	3,9
P4-FOR-CC10B-7.0-7.5	JC22855-7A	MERCURY	0.0085	0.12	0.12	0.039	Qualify	9
P4-FOR-CC10B-9.0-9.5	JC22855-8A	MERCURY	0.0085	0.015B	0.015	0.037	Negate, Qualify	2,9
P4-FOR-FF9B-1.0-1.5	JC22855-9A	MERCURY	0.0085	0.063	0.063	0.033	Qualify	3,9
P4-FOR-FF9B-11.0-11.5	JC22855-10A	NICKEL	U	4.0B	4.0	4.8	Qualify	1
P4-FOR-FF9B-11.5-12.0	JC22855-11A	NICKEL	U	5.0	5.0	4.7		
P4-FOR-FF9B-3.0-3.5	JC22855-12A	NICKEL	U	18.6	18.6	4.8		
P4-FOR-FF9B-3.0-3.5X	JC22855-13A	NICKEL	U	20.1	20.1	4.5		
P4-FOR-FF9B-5.0-5.5	JC22855-14A	NICKEL	U	28.2	28.2	4.9		
P4-FOR-FF9B-7.0-7.5	JC22855-15A	NICKEL	U	42.1	42.1	5.0		

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P4-FOR-FF9B-9.0-9.5	JC22855-16A	NICKEL	U	2.2B	2.2	4.7	Qualify	1
P4-FOR-Y12B-0.5-1.0	JC22855-17A	NICKEL	U	92.1	92.1	4.5		
P4-FOR-Y12B-2.0-2.5	JC22855-18A	NICKEL	U	51.3	51.3	4.7		
P4-FOR-Y12B-4.0-4.5	JC22855-19A	NICKEL	U	35.4	35.4	4.7		
P4-FOR-Y12B-6.0-6.5	JC22855-20A	NICKEL	U	55.7	55.7	4.7		
P4-FOR-Y12B-6.5-7.0	JC22855-21A	NICKEL	U	14.1	14.1	5.4		
P4-FOR-Y12B-7.0-7.5	JC22855-22A	NICKEL	U	13.0	13.0	4.7		
P4-FOR-CC10B-1.0-1.5	JC22855-2A	NICKEL	U	44.7	44.7	4.5		
P4-FOR-CC10B-10.5-11.0	JC22855-3A	NICKEL	U	9.0	9.0	3.1		
P4-FOR-CC10B-11.0-11.5	JC22855-4A	NICKEL	U	6.2	6.2	4.7		
P4-FOR-CC10B-3.0-3.5	JC22855-5A	NICKEL	U	8.9	8.9	4.7		
P4-FOR-CC10B-5.0-5.5	JC22855-6A	NICKEL	U	9.2	9.2	4.6		
P4-FOR-CC10B-7.0-7.5	JC22855-7A	NICKEL	U	12.2	12.2	4.8		
P4-FOR-CC10B-9.0-9.5	JC22855-8A	NICKEL	U	5.9	5.9	4.9		
P4-FOR-FF9B-1.0-1.5	JC22855-9A	NICKEL	U	26.4	26.4	4.1		
P4-FOR-FF9B-11.0-11.5	JC22855-10A	POTASSIUM	U	412B	412	1200	Qualify	1
P4-FOR-FF9B-11.5-12.0	JC22855-11A	POTASSIUM	U	757B	757	1200	Qualify	1
P4-FOR-FF9B-3.0-3.5	JC22855-12A	POTASSIUM	U	1110B	1110	1200	Qualify	1
P4-FOR-FF9B-3.0-3.5X	JC22855-13A	POTASSIUM	U	1150	1150	1100		
P4-FOR-FF9B-5.0-5.5	JC22855-14A	POTASSIUM	U	947B	947	1200	Qualify	1
P4-FOR-FF9B-7.0-7.5	JC22855-15A	POTASSIUM	U	1010B	1010	1300	Qualify	1
P4-FOR-FF9B-9.0-9.5	JC22855-16A	POTASSIUM	U	195B	195	1200	Qualify	1
P4-FOR-Y12B-0.5-1.0	JC22855-17A	POTASSIUM	U	515B	515	1100	Qualify	1
P4-FOR-Y12B-2.0-2.5	JC22855-18A	POTASSIUM	U	466B	466	1200	Qualify	1
P4-FOR-Y12B-4.0-4.5	JC22855-19A	POTASSIUM	U	414B	414	1200	Qualify	1

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
P4-FOR-Y12B-6.0-6.5	JC22855-20A	POTASSIUM	U	548B	548	1200	Qualify	1
P4-FOR-Y12B-6.5-7.0	JC22855-21A	POTASSIUM	U	503B	503	1400	Qualify	1
P4-FOR-Y12B-7.0-7.5	JC22855-22A	POTASSIUM	U	1130B	1130	1200	Qualify	1
P4-FOR-CC10B-1.0-1.5	JC22855-2A	POTASSIUM	U	445B	445	1100	Qualify	1
P4-FOR-CC10B-10.5-11.0	JC22855-3A	POTASSIUM	U	756B	756	780	Qualify	1
P4-FOR-CC10B-11.0-11.5	JC22855-4A	POTASSIUM	U	878B	878	1200	Qualify	1
P4-FOR-CC10B-3.0-3.5	JC22855-5A	POTASSIUM	U	866B	866	1200	Qualify	1
P4-FOR-CC10B-5.0-5.5	JC22855-6A	POTASSIUM	U	763B	763	1100	Qualify	1
P4-FOR-CC10B-7.0-7.5	JC22855-7A	POTASSIUM	U	509B	509	1200	Qualify	1
P4-FOR-CC10B-9.0-9.5	JC22855-8A	POTASSIUM	U	167B	167	1200	Qualify	1
P4-FOR-FF9B-1.0-1.5	JC22855-9A	POTASSIUM	U	424B	424	1000	Qualify	1
P4-FOR-FF9B-5.0-5.5	JC22855-14A	SELENIUM	U	0.72B	0.72	2.4	Qualify	1
P4-FOR-Y12B-0.5-1.0	JC22855-17A	SELENIUM	U	1.3B	1.3	2.3	Qualify	1
P4-FOR-Y12B-4.0-4.5	JC22855-19A	SELENIUM	U	2.0B	2.0	2.4	Qualify	1
P4-FOR-Y12B-6.0-6.5	JC22855-20A	SELENIUM	U	3.3	3.3	2.4		
P4-FOR-Y12B-6.5-7.0	JC22855-21A	SELENIUM	U	1.8B	1.8	2.7	Qualify	1
P4-FOR-CC10B-10.5-11.0	JC22855-3A	SELENIUM	U	0.37B	0.37	1.6	Qualify	1
P4-FOR-CC10B-7.0-7.5	JC22855-7A	SELENIUM	U	0.57B	0.57	2.4	Qualify	1
P4-FOR-FF9B-11.0-11.5	JC22855-10A	SILVER	-0.13	U	U	0.60	Qualify	4
P4-FOR-FF9B-11.5-12.0	JC22855-11A	SILVER	-0.13	U	U	0.59	Qualify	4
P4-FOR-FF9B-3.0-3.5	JC22855-12A	SILVER	-0.13	0.27B	0.27	0.60	Qualify	4
P4-FOR-FF9B-3.0-3.5X	JC22855-13A	SILVER	-0.13	0.31B	0.31	0.57	Qualify	4
P4-FOR-FF9B-5.0-5.5	JC22855-14A	SILVER	-0.13	0.60B	0.60	0.61	Qualify	4
P4-FOR-FF9B-7.0-7.5	JC22855-15A	SILVER	-0.13	0.68	0.68	0.63	Qualify	4
P4-FOR-FF9B-9.0-9.5	JC22855-16A	SILVER	-0.13	U	U	0.59	Qualify	4

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
P4-FOR-Y12B-0.5-1.0	JC22855-17A	SILVER	-0.13	0.14B	0.14	0.57	Qualify	4
P4-FOR-Y12B-2.0-2.5	JC22855-18A	SILVER	-0.13	0.36B	0.36	1.2	Qualify	4
P4-FOR-Y12B-4.0-4.5	JC22855-19A	SILVER	-0.13	U	U	0.59	Qualify	4
P4-FOR-Y12B-6.0-6.5	JC22855-20A	SILVER	-0.13	0.17B	0.17	0.59	Qualify	4
P4-FOR-Y12B-6.5-7.0	JC22855-21A	SILVER	-0.13	U	U	0.68	Qualify	4
P4-FOR-Y12B-7.0-7.5	JC22855-22A	SILVER	U	0.72	0.72	0.59		
P4-FOR-CC10B-1.0-1.5	JC22855-2A	SILVER	-0.13	1.0	1.0	0.56	Qualify	4
P4-FOR-CC10B-10.5-11.0	JC22855-3A	SILVER	-0.13	U	U	0.39	Qualify	4
P4-FOR-CC10B-11.0-11.5	JC22855-4A	SILVER	-0.13	U	U	0.59	Qualify	4
P4-FOR-CC10B-3.0-3.5	JC22855-5A	SILVER	-0.13	U	U	0.59	Qualify	4
P4-FOR-CC10B-5.0-5.5	JC22855-6A	SILVER	-0.13	0.13B	0.13	0.57	Qualify	4
P4-FOR-CC10B-7.0-7.5	JC22855-7A	SILVER	-0.13	0.16B	0.16	0.60	Qualify	4
P4-FOR-CC10B-9.0-9.5	JC22855-8A	SILVER	-0.13	U	U	0.61	Qualify	4
P4-FOR-FF9B-1.0-1.5	JC22855-9A	SILVER	-0.13	1.9	1.9	1.0		
P4-FOR-FF9B-11.0-11.5	JC22855-10A	SODIUM	U	97.0B	97.0	1200	Qualify	5
P4-FOR-FF9B-11.5-12.0	JC22855-11A	SODIUM	U	132B	132	1200	Qualify	5
P4-FOR-FF9B-3.0-3.5	JC22855-12A	SODIUM	U	717B	717	1200	Qualify	1
P4-FOR-FF9B-3.0-3.5X	JC22855-13A	SODIUM	U	724B	724	1100	Qualify	1
P4-FOR-FF9B-5.0-5.5	JC22855-14A	SODIUM	U	596B	596	1200	Qualify	1
P4-FOR-FF9B-7.0-7.5	JC22855-15A	SODIUM	U	269B	269	1300	Qualify	1
P4-FOR-FF9B-9.0-9.5	JC22855-16A	SODIUM	U	80.8B	80.8	1200	Qualify	5
P4-FOR-Y12B-0.5-1.0	JC22855-17A	SODIUM	U	891B	891	1100	Qualify	1
P4-FOR-Y12B-2.0-2.5	JC22855-18A	SODIUM	U	212B	212	1200	Qualify	1
P4-FOR-Y12B-4.0-4.5	JC22855-19A	SODIUM	U	187B	187	1200	Qualify	1
P4-FOR-Y12B-6.0-6.5	JC22855-20A	SODIUM	U	253B	253	1200	Qualify	1

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
P4-FOR-Y12B-6.5-7.0	JC22855-21A	SODIUM	U	297B	297	1400	Qualify	1
P4-FOR-Y12B-7.0-7.5	JC22855-22A	SODIUM	U	508B	508	1200	Qualify	1
P4-FOR-CC10B-1.0-1.5	JC22855-2A	SODIUM	U	777B	777	1100	Qualify	1
P4-FOR-CC10B-10.5-11.0	JC22855-3A	SODIUM	U	170B	170	780	Qualify	1
P4-FOR-CC10B-11.0-11.5	JC22855-4A	SODIUM	U	110B	110	1200	Qualify	5
P4-FOR-CC10B-3.0-3.5	JC22855-5A	SODIUM	U	194B	194	1200	Qualify	1
P4-FOR-CC10B-5.0-5.5	JC22855-6A	SODIUM	U	343B	343	1100	Qualify	1
P4-FOR-CC10B-7.0-7.5	JC22855-7A	SODIUM	U	79.7B	79.7	1200	Qualify	5
P4-FOR-CC10B-9.0-9.5	JC22855-8A	SODIUM	U	51.7B	51.7	1200	Qualify	5
P4-FOR-FF9B-1.0-1.5	JC22855-9A	SODIUM	U	413B	413	1000	Qualify	1
P4-FOR-Y12B-0.5-1.0	JC22855-17A	THALLIUM	U	0.83B	0.83	1.1	Qualify	1
P4-FOR-Y12B-4.0-4.5	JC22855-19A	THALLIUM	U	0.58B	0.58	1.2	Qualify	1
P4-FOR-Y12B-6.0-6.5	JC22855-20A	THALLIUM	U	1.0B	1.0	1.2	Qualify	1
P4-FOR-FF9B-11.0-11.5	JC22855-10A	VANADIUM	U	14.0	14.0	6.0		
P4-FOR-FF9B-11.5-12.0	JC22855-11A	VANADIUM	U	11.2	11.2	5.9		
P4-FOR-FF9B-3.0-3.5	JC22855-12A	VANADIUM	U	19.6	19.6	6.0		
P4-FOR-FF9B-3.0-3.5X	JC22855-13A	VANADIUM	U	20.6	20.6	5.7		
P4-FOR-FF9B-5.0-5.5	JC22855-14A	VANADIUM	U	46.7	46.7	6.1		
P4-FOR-FF9B-7.0-7.5	JC22855-15A	VANADIUM	U	69.4	69.4	6.3		
P4-FOR-FF9B-9.0-9.5	JC22855-16A	VANADIUM	U	11.7	11.7	5.9		
P4-FOR-Y12B-0.5-1.0	JC22855-17A	VANADIUM	U	129	129	5.7		
P4-FOR-Y12B-2.0-2.5	JC22855-18A	VANADIUM	U	31.7	31.7	5.8		
P4-FOR-Y12B-4.0-4.5	JC22855-19A	VANADIUM	U	47.4	47.4	5.9		
P4-FOR-Y12B-6.0-6.5	JC22855-20A	VANADIUM	U	82.0	82.0	12		
P4-FOR-Y12B-6.5-7.0	JC22855-21A	VANADIUM	U	16.5	16.5	6.8		

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
P4-FOR-Y12B-7.0-7.5	JC22855-22A	VANADIUM	U	24.6	24.6	5.9		
P4-FOR-CC10B-1.0-1.5	JC22855-2A	VANADIUM	U	58.7	58.7	5.6		
P4-FOR-CC10B-10.5-11.0	JC22855-3A	VANADIUM	U	14.0	14.0	3.9		
P4-FOR-CC10B-11.0-11.5	JC22855-4A	VANADIUM	U	11.7	11.7	5.9		
P4-FOR-CC10B-3.0-3.5	JC22855-5A	VANADIUM	U	18.2	18.2	5.9		
P4-FOR-CC10B-5.0-5.5	JC22855-6A	VANADIUM	U	20.4	20.4	5.7		
P4-FOR-CC10B-7.0-7.5	JC22855-7A	VANADIUM	U	15.9	15.9	6.0		
P4-FOR-CC10B-9.0-9.5	JC22855-8A	VANADIUM	U	6.3	6.3	6.1		
P4-FOR-FF9B-1.0-1.5	JC22855-9A	VANADIUM	U	29.4B	29.4	51	Qualify	1
P4-FOR-FF9B-11.0-11.5	JC22855-10A	ZINC	U	196	196	6.0		
P4-FOR-FF9B-11.5-12.0	JC22855-11A	ZINC	U	27.2	27.2	5.9		
P4-FOR-FF9B-3.0-3.5	JC22855-12A	ZINC	U	154	154	6.0		
P4-FOR-FF9B-3.0-3.5X	JC22855-13A	ZINC	U	174	174	5.7		
P4-FOR-FF9B-5.0-5.5	JC22855-14A	ZINC	U	202	202	6.1		
P4-FOR-FF9B-7.0-7.5	JC22855-15A	ZINC	U	176	176	6.3		
P4-FOR-FF9B-9.0-9.5	JC22855-16A	ZINC	U	8.1	8.1	5.9		
P4-FOR-Y12B-0.5-1.0	JC22855-17A	ZINC	U	902	902	5.7		
P4-FOR-Y12B-2.0-2.5	JC22855-18A	ZINC	U	855	855	5.8		
P4-FOR-Y12B-4.0-4.5	JC22855-19A	ZINC	U	525	525	5.9		
P4-FOR-Y12B-6.0-6.5	JC22855-20A	ZINC	U	695	695	12		
P4-FOR-Y12B-6.5-7.0	JC22855-21A	ZINC	U	114	114	6.8		
P4-FOR-Y12B-7.0-7.5	JC22855-22A	ZINC	0.31	37.8	37.8	5.9		
P4-FOR-CC10B-1.0-1.5	JC22855-2A	ZINC	U	108	108	5.6		
P4-FOR-CC10B-10.5-11.0	JC22855-3A	ZINC	U	73.8	73.8	3.9		
P4-FOR-CC10B-11.0-11.5	JC22855-4A	ZINC	U	21.1	21.1	5.9		

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
P4-FOR-CC10B-3.0-3.5	JC22855-5A	ZINC	U	60.6	60.6	5.9		
P4-FOR-CC10B-5.0-5.5	JC22855-6A	ZINC	U	114	114	5.7		
P4-FOR-CC10B-7.0-7.5	JC22855-7A	ZINC	U	72.2	72.2	6.0		
P4-FOR-CC10B-9.0-9.5	JC22855-8A	ZINC	U	6.9	6.9	6.1		
P4-FOR-FF9B-1.0-1.5	JC22855-9A	ZINC	U	320	320	51		

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

NJDEP Laboratory Footnote

1. The reported result was greater than the MDL but less than the RL and therefore was estimated.
2. The value reported is less than or equal to 3x the value in the method blank. It is the policy of NJDEP-DPFSR to negate the reported value due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
3. The value reported is greater than three (3) but less than ten (10) times the value in the method blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to the method blank contamination. The "B" qualifier alerts the end-user to the presence of this analyte in the method blank.
4. The reported value was qualified because of negative instrument drift.
5. The value reported is greater than 3x but less than ten (10) the value in the trip/field blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to trip/field blank contamination.
6. The reported result was qualified because of high MS recovery.
7. The reported result was qualified because of low MS recovery.
8. The reported result was qualified because of both low and high MS recovery.
9. The reported result was qualified because of poor field duplicate precision.

Aqueous Target Analyte Summary Hit List (TAL Metals)

Site Name PPG-Forrest PDI
Sampling Date June 23, 2016
Lab Name/ID SGS/Accutest, Dayton, NJ
SDG No JC22855A
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID FOR-FB20160623

Field Sample ID	Lab Sample ID	Analyte	Method Blank (ug/L)	Laboratory Sample Result (ug/L)	Validation Sample Result (ug/L)	RL (ug/L)	Quality Assurance Decision	NJDEP Validation Footnote
FOR-FB20160623	JC22855-1A	BARIUM	U	1.7B	1.7	200	Qualify	1
FOR-FB20160623	JC22855-1A	CALCIUM METAL	U	78.8B	78.8	5000	Qualify	1
FOR-FB20160623	JC22855-1A	MANGANESE	U	0.80B	0.80	15	Qualify	1
FOR-FB20160623	JC22855-1A	NICKEL	U	1.0B	1.0	10	Qualify	1
FOR-FB20160623	JC22855-1A	SODIUM	33.4	139B	139	10000	Qualify	2
FOR-FB20160623	JC22855-1A	ZINC	U	1.4B	1.4	20	Qualify	1

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

NJDEP Laboratory Footnote

1. The reported result was greater than the MDL but less than the RL and therefore was estimated.
2. The value reported is greater than three (3) but less than ten (10) times the value in the method blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to the method blank contamination. The "B" qualifier alerts the end-user to the presence of this analyte in the method blank.

Soil Target Analyte Summary Hit List (VOCs)

Site Name PPG-Forrest PDI
Sampling Date June 23, 2016
Lab Name/ID SGS/Accutest, Dayton, NJ
SDG No JC22855A
Sample Matrix Soil
Trip Blank ID NA
Field Blank ID FOR-FB20160623

Field Sample ID	Lab Sample ID	Analyte	Method Blank (ug/kg)	Laboratory Sample Result (ug/kg)	Validation Sample Result (ug/kg)	RL (ug/kg)	Quality Assurance Decision	NJDEP Validation Footnote
P4-FOR-CC10B-1.0-1.5	JC22855-2A	ETHYLBENZENE	U	1.3	1.3	0.99		
P4-FOR-CC10B-1.0-1.5	JC22855-2A	DICHLOROMETHANE	U	0.81J	0.81	4.9	Qualify	1
P4-FOR-CC10B-1.0-1.5	JC22855-2A	CARBON DISULFIDE	U	2.0	2.0	2.0		
P4-FOR-CC10B-1.0-1.5	JC22855-2A	METHYLCYCLOHEXANE	U	0.80J	0.80	2.0	Qualify	1
P4-FOR-CC10B-10.5-11.0	JC22855-3A	ETHYLBENZENE	U	1.2	1.2	0.98		
P4-FOR-CC10B-10.5-11.0	JC22855-3A	1,2-DICHLOROBENZENE	U	4.6	4.6	0.98		
P4-FOR-CC10B-10.5-11.0	JC22855-3A	1,2,3-TRICHLOROBENZENE	U	0.70J	0.70	4.9	Qualify	1
P4-FOR-CC10B-10.5-11.0	JC22855-3A	TRICHLOROETHYLENE	U	3.0	3.0	0.98		
P4-FOR-CC10B-10.5-11.0	JC22855-3A	DICHLOROMETHANE	U	1.3J	1.3	4.9	Qualify	1
P4-FOR-CC10B-10.5-11.0	JC22855-3A	CARBON DISULFIDE	U	1.9J	1.9	2.0	Qualify	1
P4-FOR-CC10B-10.5-11.0	JC22855-3A	BENZENE	U	7.6	7.6	0.49		
P4-FOR-CC10B-10.5-11.0	JC22855-3A	M-DICHLOROBENZENE	U	2.3	2.3	0.98		
P4-FOR-CC10B-10.5-11.0	JC22855-3A	CIS-1,2-DICHLOROETHENE	U	1.4	1.4	0.98		
P4-FOR-CC10B-10.5-11.0	JC22855-3A	TETRACHLOROETHENE	U	0.64J	0.64	2.0	Qualify	1
P4-FOR-CC10B-10.5-11.0	JC22855-3A	1,2,4-TRICHLOROBENZENE	U	2.9J	2.9	4.9	Qualify	1
P4-FOR-CC10B-10.5-11.0	JC22855-3A	CHLOROBENZENE	U	3.7	3.7	2.0		
P4-FOR-CC10B-10.5-11.0	JC22855-3A	1,4-DICHLOROBENZENE	U	4.8	4.8	0.98		
P4-FOR-CC10B-11.0-11.5	JC22855-4A	DICHLOROMETHANE	U	1.3J	1.3	5.6	Qualify	1

Field Sample ID	Lab Sample ID	Analyte	Method Blank (ug/kg)	Laboratory Sample Result (ug/kg)	Validation Sample Result (ug/kg)	RL (ug/kg)	Quality Assurance Decision	NJDEP Validation Footnote
P4-FOR-CC10B-11.0-11.5	JC22855-4A	BENZENE	U	0.34J	0.34	0.56	Qualify	1
P4-FOR-CC10B-11.0-11.5	JC22855-4A	METHYL-TERT-BUTYL ETHER	U	0.77J	0.77	1.1	Qualify	1
P4-FOR-CC10B-11.0-11.5	JC22855-4A	CHLOROBENZENE	U	4.7	4.7	2.3		
P4-FOR-CC10B-11.0-11.5	JC22855-4A	1,4-DICHLOROBENZENE	U	0.56J	0.56	1.1	Qualify	1
P4-FOR-CC10B-3.0-3.5	JC22855-5A	DICHLOROMETHANE	U	0.84J	0.84	4.9	Qualify	1
P4-FOR-CC10B-3.0-3.5	JC22855-5A	BENZENE	U	1.0	1.0	0.49		
P4-FOR-CC10B-3.0-3.5	JC22855-5A	ACETONE	U	24.6	24.6	9.8		
P4-FOR-CC10B-3.0-3.5	JC22855-5A	METHYL-TERT-BUTYL ETHER	U	U	U	0.98	Qualify	2
P4-FOR-CC10B-3.0-3.5	JC22855-5A	CHLOROBENZENE	U	1.6J	1.6	2.0	Qualify	1
P4-FOR-CC10B-5.0-5.5	JC22855-6A	ISOPROPYLBENZENE	U	1.3J	1.3	1.9	Qualify	1
P4-FOR-CC10B-5.0-5.5	JC22855-6A	M+P-XYLENE	U	3.9	3.9	0.96		
P4-FOR-CC10B-5.0-5.5	JC22855-6A	1,2-DICHLOROBENZENE	U	0.81J	0.81	0.96	Qualify	1
P4-FOR-CC10B-5.0-5.5	JC22855-6A	O-XYLENE	U	1.8	1.8	0.96		
P4-FOR-CC10B-5.0-5.5	JC22855-6A	DICHLOROMETHANE	U	1.0J	1.0	4.8	Qualify	1
P4-FOR-CC10B-5.0-5.5	JC22855-6A	CARBON DISULFIDE	U	1.1J	1.1	1.9	Qualify	1
P4-FOR-CC10B-5.0-5.5	JC22855-6A	1,4-DICHLOROBENZENE	U	8.8	8.8	0.96		
P4-FOR-CC10B-5.0-5.5	JC22855-6A	METHYLCYCLOHEXANE	U	1.1J	1.1	1.9	Qualify	1
P4-FOR-CC10B-5.0-5.5	JC22855-6A	TOLUENE	U	1.1	1.1	0.96		
P4-FOR-CC10B-5.0-5.5	JC22855-6A	CHLOROBENZENE	U	8.9	8.9	1.9		
P4-FOR-CC10B-5.0-5.5	JC22855-6A	XYLENES	U	5.7	5.7	0.96		
P4-FOR-CC10B-5.0-5.5	JC22855-6A	M-DICHLOROBENZENE	U	6.2	6.2	0.96		
P4-FOR-CC10B-5.0-5.5	JC22855-6A	ACETONE	U	15.0	15.0	9.6		
P4-FOR-CC10B-5.0-5.5	JC22855-6A	BENZENE	U	0.46J	0.46	0.48	Qualify	1
P4-FOR-CC10B-7.0-7.5	JC22855-7A	1,4-DICHLOROBENZENE	U	6.3	6.3	1.0		
P4-FOR-CC10B-7.0-7.5	JC22855-7A	CHLOROBENZENE	U	43.1	43.1	2.0		

Field Sample ID	Lab Sample ID	Analyte	Method Blank (ug/kg)	Laboratory Sample Result (ug/kg)	Validation Sample Result (ug/kg)	RL (ug/kg)	Quality Assurance Decision	NJDEP Validation Footnote
P4-FOR-CC10B-7.0-7.5	JC22855-7A	M-DICHLOROBENZENE	U	4.1	4.1	1.0		
P4-FOR-CC10B-7.0-7.5	JC22855-7A	ACETONE	U	49.8	49.8	10		
P4-FOR-CC10B-7.0-7.5	JC22855-7A	BENZENE	U	0.75	0.75	0.51		
P4-FOR-CC10B-7.0-7.5	JC22855-7A	DICHLOROMETHANE	U	1.4J	1.4	5.1	Qualify	1
P4-FOR-CC10B-7.0-7.5	JC22855-7A	CARBON DISULFIDE	U	11.0	11.0	2.0		
P4-FOR-CC10B-7.0-7.5	JC22855-7A	1,2-DICHLOROBENZENE	U	1.1	1.1	1.0		
P4-FOR-CC10B-7.0-7.5	JC22855-7A	ISOPROPYLBENZENE	U	0.72J	0.72	2.0	Qualify	1
P4-FOR-CC10B-9.0-9.5	JC22855-8A	1,4-DICHLOROBENZENE	U	1.3	1.3	1.1		
P4-FOR-CC10B-9.0-9.5	JC22855-8A	CHLOROBENZENE	U	2.1J	2.1	2.2	Qualify	1
P4-FOR-CC10B-9.0-9.5	JC22855-8A	1,2,4-TRICHLOROBENZENE	U	1.3J	1.3	5.5	Qualify	1
P4-FOR-CC10B-9.0-9.5	JC22855-8A	TETRACHLOROETHENE	U	0.87J	0.87	2.2	Qualify	1
P4-FOR-CC10B-9.0-9.5	JC22855-8A	METHYL-TERT-BUTYL ETHER	U	0.42J	0.42	1.1	Qualify	1
P4-FOR-CC10B-9.0-9.5	JC22855-8A	M-DICHLOROBENZENE	U	0.56J	0.56	1.1	Qualify	1
P4-FOR-CC10B-9.0-9.5	JC22855-8A	BENZENE	U	1.4	1.4	0.55		
P4-FOR-CC10B-9.0-9.5	JC22855-8A	DICHLOROMETHANE	U	1.5J	1.5	5.5	Qualify	1
P4-FOR-CC10B-9.0-9.5	JC22855-8A	CARBON DISULFIDE	U	1.8J	1.8	2.2	Qualify	1
P4-FOR-CC10B-9.0-9.5	JC22855-8A	1,2-DICHLOROBENZENE	U	0.77J	0.77	1.1	Qualify	1
P4-FOR-FF9B-1.0-1.5	JC22855-9A	ETHYLBENZENE	U	1.0	1.0	0.95		
P4-FOR-FF9B-1.0-1.5	JC22855-9A	1,4-DICHLOROBENZENE	U	6.2	6.2	0.95		
P4-FOR-FF9B-1.0-1.5	JC22855-9A	METHYLCYCLOHEXANE	U	3.7	3.7	1.9		
P4-FOR-FF9B-1.0-1.5	JC22855-9A	TOLUENE	U	0.69J	0.69	0.95	Qualify	1
P4-FOR-FF9B-1.0-1.5	JC22855-9A	CHLOROBENZENE	U	58.2	58.2	1.9		
P4-FOR-FF9B-1.0-1.5	JC22855-9A	CYCLOHEXANE	U	0.95J	0.95	1.9	Qualify	1
P4-FOR-FF9B-1.0-1.5	JC22855-9A	XYLENES	U	0.57J	0.57	0.95	Qualify	1
P4-FOR-FF9B-1.0-1.5	JC22855-9A	M-DICHLOROBENZENE	U	4.0	4.0	0.95		

Field Sample ID	Lab Sample ID	Analyte	Method Blank (ug/kg)	Laboratory Sample Result (ug/kg)	Validation Sample Result (ug/kg)	RL (ug/kg)	Quality Assurance Decision	NJDEP Validation Footnote
P4-FOR-FF9B-1.0-1.5	JC22855-9A	BENZENE	U	4.5	4.5	0.48		
P4-FOR-FF9B-1.0-1.5	JC22855-9A	DICHLOROMETHANE	U	0.91J	0.91	4.8	Qualify	1
P4-FOR-FF9B-1.0-1.5	JC22855-9A	CARBON DISULFIDE	U	1.7J	1.7	1.9	Qualify	1
P4-FOR-FF9B-1.0-1.5	JC22855-9A	O-XYLENE	U	0.57J	0.57	0.95	Qualify	1
P4-FOR-FF9B-1.0-1.5	JC22855-9A	1,2-DICHLOROBENZENE	U	2.0	2.0	0.95		
P4-FOR-FF9B-1.0-1.5	JC22855-9A	ISOPROPYLBENZENE	U	5.6	5.6	1.9		
P4-FOR-FF9B-11.0-11.5	JC22855-10A	ETHYLBENZENE	U	18.0J	18.0	70	Qualify	1
P4-FOR-FF9B-11.0-11.5	JC22855-10A	TOLUENE	U	13.8J	13.8	70	Qualify	1
P4-FOR-FF9B-11.0-11.5	JC22855-10A	CHLOROBENZENE	U	7540	7540	140		
P4-FOR-FF9B-11.0-11.5	JC22855-10A	1,2,4-TRICHLOROBENZENE	U	2670	2670	350		
P4-FOR-FF9B-11.0-11.5	JC22855-10A	XYLENES	U	27.4J	27.4	70	Qualify	1
P4-FOR-FF9B-11.0-11.5	JC22855-10A	CIS-1,2-DICHLOROETHENE	U	56.4J	56.4	70	Qualify	1
P4-FOR-FF9B-11.0-11.5	JC22855-10A	M-DICHLOROBENZENE	U	8640	8640	70		
P4-FOR-FF9B-11.0-11.5	JC22855-10A	BENZENE	U	46.3	46.3	35		
P4-FOR-FF9B-11.0-11.5	JC22855-10A	TRICHLOROETHYLENE	U	141	141	70		
P4-FOR-FF9B-11.0-11.5	JC22855-10A	1,2,3-TRICHLOROBENZENE	U	273J	273	350	Qualify	1
P4-FOR-FF9B-11.0-11.5	JC22855-10A	1,2-DICHLOROBENZENE	U	7590	7590	70		
P4-FOR-FF9B-11.0-11.5	JC22855-10A	M+P-XYLENE	U	27.4J	27.4	70	Qualify	1
P4-FOR-FF9B-11.0-11.5	JC22855-10A	1,4-DICHLOROBENZENE	U	18300	18300	700		
P4-FOR-FF9B-11.5-12.0	JC22855-11A	1,4-DICHLOROBENZENE	U	1330	1330	70		
P4-FOR-FF9B-11.5-12.0	JC22855-11A	CHLOROBENZENE	U	538	538	140		
P4-FOR-FF9B-11.5-12.0	JC22855-11A	1,2,4-TRICHLOROBENZENE	U	225J	225	350	Qualify	1
P4-FOR-FF9B-11.5-12.0	JC22855-11A	M-DICHLOROBENZENE	U	707	707	70		
P4-FOR-FF9B-11.5-12.0	JC22855-11A	1,2-DICHLOROBENZENE	U	656	656	70		
P4-FOR-FF9B-3.0-3.5	JC22855-12A	ETHYLBENZENE	U	1.6	1.6	0.98		

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P4-FOR-FF9B-3.0-3.5	JC22855-12A	1,4-DICHLOROBENZENE	U	12.8	12.8	0.98		
P4-FOR-FF9B-3.0-3.5	JC22855-12A	METHYLCYCLOHEXANE	U	4.1	4.1	2.0		
P4-FOR-FF9B-3.0-3.5	JC22855-12A	TOLUENE	U	1.2	1.2	0.98		
P4-FOR-FF9B-3.0-3.5	JC22855-12A	CHLOROBENZENE	U	97.4	97.4	2.0		
P4-FOR-FF9B-3.0-3.5	JC22855-12A	CYCLOHEXANE	U	1.3J	1.3	2.0	Qualify	1
P4-FOR-FF9B-3.0-3.5	JC22855-12A	XYLENES	U	2.2	2.2	0.98		
P4-FOR-FF9B-3.0-3.5	JC22855-12A	M-DICHLOROBENZENE	U	7.1	7.1	0.98		
P4-FOR-FF9B-3.0-3.5	JC22855-12A	BENZENE	U	27.5	27.5	0.49		
P4-FOR-FF9B-3.0-3.5	JC22855-12A	DICHLOROMETHANE	U	1.1J	1.1	4.9	Qualify	1
P4-FOR-FF9B-3.0-3.5	JC22855-12A	CARBON DISULFIDE	U	1.4J	1.4	2.0	Qualify	1
P4-FOR-FF9B-3.0-3.5	JC22855-12A	O-XYLENE	U	1.1	1.1	0.98		
P4-FOR-FF9B-3.0-3.5	JC22855-12A	1,2-DICHLOROBENZENE	U	4.4	4.4	0.98	Qualify	3
P4-FOR-FF9B-3.0-3.5	JC22855-12A	ISOPROPYLBENZENE	U	5.8	5.8	2.0		
P4-FOR-FF9B-3.0-3.5	JC22855-12A	M+P-XYLENE	U	1.1	1.1	0.98		
P4-FOR-FF9B-3.0-3.5X	JC22855-13A	ETHYLBENZENE	U	0.64J	0.64	0.95	Qualify	1
P4-FOR-FF9B-3.0-3.5X	JC22855-13A	1,4-DICHLOROBENZENE	U	9.1	9.1	0.95		
P4-FOR-FF9B-3.0-3.5X	JC22855-13A	1,2-DICHLOROETHANE	U	0.50J	0.50	0.95	Qualify	1
P4-FOR-FF9B-3.0-3.5X	JC22855-13A	METHYLCYCLOHEXANE	U	3.7	3.7	1.9		
P4-FOR-FF9B-3.0-3.5X	JC22855-13A	CHLOROBENZENE	U	83.1	83.1	1.9		
P4-FOR-FF9B-3.0-3.5X	JC22855-13A	CYCLOHEXANE	U	1.0J	1.0	1.9	Qualify	1
P4-FOR-FF9B-3.0-3.5X	JC22855-13A	XYLENES	U	1.6	1.6	0.95		
P4-FOR-FF9B-3.0-3.5X	JC22855-13A	M-DICHLOROBENZENE	U	5.5	5.5	0.95		
P4-FOR-FF9B-3.0-3.5X	JC22855-13A	BENZENE	U	17.0	17.0	0.47		
P4-FOR-FF9B-3.0-3.5X	JC22855-13A	DICHLOROMETHANE	U	0.76J	0.76	4.7	Qualify	1
P4-FOR-FF9B-3.0-3.5X	JC22855-13A	CARBON DISULFIDE	U	1.5J	1.5	1.9	Qualify	1

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P4-FOR-FF9B-3.0-3.5X	JC22855-13A	O-XYLENE	U	0.76J	0.76	0.95	Qualify	1
P4-FOR-FF9B-3.0-3.5X	JC22855-13A	1,2-DICHLOROBENZENE	U	1.8	1.8	0.95	Qualify	3
P4-FOR-FF9B-3.0-3.5X	JC22855-13A	ISOPROPYLBENZENE	U	4.6	4.6	1.9		
P4-FOR-FF9B-3.0-3.5X	JC22855-13A	M+P-XYLENE	U	0.80J	0.80	0.95	Qualify	1
P4-FOR-FF9B-5.0-5.5	JC22855-14A	ETHYLBENZENE	U	94.7	94.7	63		
P4-FOR-FF9B-5.0-5.5	JC22855-14A	O-XYLENE	U	107	107	63		
P4-FOR-FF9B-5.0-5.5	JC22855-14A	1,2-DICHLOROBENZENE	U	307	307	63		
P4-FOR-FF9B-5.0-5.5	JC22855-14A	ISOPROPYLBENZENE	U	410	410	130		
P4-FOR-FF9B-5.0-5.5	JC22855-14A	M+P-XYLENE	U	97.1	97.1	63		
P4-FOR-FF9B-5.0-5.5	JC22855-14A	1,4-DICHLOROBENZENE	U	2750	2750	63		
P4-FOR-FF9B-5.0-5.5	JC22855-14A	METHYLCYCLOHEXANE	U	191	191	130		
P4-FOR-FF9B-5.0-5.5	JC22855-14A	TOLUENE	U	50.5J	50.5	63	Qualify	1
P4-FOR-FF9B-5.0-5.5	JC22855-14A	1,2,4-TRICHLOROBENZENE	U	29.9J	29.9	310	Qualify	1
P4-FOR-FF9B-5.0-5.5	JC22855-14A	XYLENES	U	205	205	63		
P4-FOR-FF9B-5.0-5.5	JC22855-14A	M-DICHLOROBENZENE	U	1660	1660	63		
P4-FOR-FF9B-5.0-5.5	JC22855-14A	BENZENE	U	582	582	31		
P4-FOR-FF9B-5.0-5.5	JC22855-14A	CHLOROBENZENE	U	52900	52900	1300		
P4-FOR-FF9B-7.0-7.5	JC22855-15A	ETHYLBENZENE	U	1.2	1.2	1.2		
P4-FOR-FF9B-7.0-7.5	JC22855-15A	1,4-DICHLOROBENZENE	U	10.8	10.8	1.2		
P4-FOR-FF9B-7.0-7.5	JC22855-15A	METHYLCYCLOHEXANE	U	4.4	4.4	2.5		
P4-FOR-FF9B-7.0-7.5	JC22855-15A	CYCLOHEXANE	U	1.9J	1.9	2.5	Qualify	1
P4-FOR-FF9B-7.0-7.5	JC22855-15A	XYLENES	U	2.1	2.1	1.2		
P4-FOR-FF9B-7.0-7.5	JC22855-15A	METHYL-TERT-BUTYL ETHER	U	1.5	1.5	1.2		
P4-FOR-FF9B-7.0-7.5	JC22855-15A	M-DICHLOROBENZENE	U	6.3	6.3	1.2		
P4-FOR-FF9B-7.0-7.5	JC22855-15A	ACETONE	U	32.7	32.7	12		

Field Sample ID	Lab Sample ID	Analyte	Method Blank (ug/kg)	Laboratory Sample Result (ug/kg)	Validation Sample Result (ug/kg)	RL (ug/kg)	Quality Assurance Decision	NJDEP Validation Footnote
P4-FOR-FF9B-7.0-7.5	JC22855-15A	BENZENE	U	35.6	35.6	0.62		
P4-FOR-FF9B-7.0-7.5	JC22855-15A	DICHLOROMETHANE	U	1.8J	1.8	6.2	Qualify	1
P4-FOR-FF9B-7.0-7.5	JC22855-15A	CARBON DISULFIDE	U	1.2J	1.2	2.5	Qualify	1
P4-FOR-FF9B-7.0-7.5	JC22855-15A	O-XYLENE	U	2.1	2.1	1.2		
P4-FOR-FF9B-7.0-7.5	JC22855-15A	1,2-DICHLOROBENZENE	U	3.1	3.1	1.2		
P4-FOR-FF9B-7.0-7.5	JC22855-15A	ISOPROPYLBENZENE	U	12.8	12.8	2.5		
P4-FOR-FF9B-7.0-7.5	JC22855-15A	CHLOROBENZENE	U	2120	2120	150		
P4-FOR-FF9B-9.0-9.5	JC22855-16A	1,4-DICHLOROBENZENE	U	688	688	64		
P4-FOR-FF9B-9.0-9.5	JC22855-16A	CHLOROBENZENE	U	1270	1270	130		
P4-FOR-FF9B-9.0-9.5	JC22855-16A	M-DICHLOROBENZENE	U	229	229	64		
P4-FOR-FF9B-9.0-9.5	JC22855-16A	BENZENE	U	14.8J	14.8	32	Qualify	1
P4-FOR-FF9B-9.0-9.5	JC22855-16A	1,2-DICHLOROBENZENE	U	79.6	79.6	64		
P4-FOR-Y12B-4.0-4.5	JC22855-19A	ETHYLBENZENE	U	1.4	1.4	1.2		
P4-FOR-Y12B-4.0-4.5	JC22855-19A	TOLUENE	U	0.68J	0.68	1.2	Qualify	1
P4-FOR-Y12B-4.0-4.5	JC22855-19A	CHLOROBENZENE	U	1.8J	1.8	2.3	Qualify	1
P4-FOR-Y12B-4.0-4.5	JC22855-19A	XYLENES	U	0.61J	0.61	1.2	Qualify	1
P4-FOR-Y12B-4.0-4.5	JC22855-19A	BENZENE	U	4.5	4.5	0.58		
P4-FOR-Y12B-4.0-4.5	JC22855-19A	DICHLOROMETHANE	U	0.78J	0.78	5.8	Qualify	1
P4-FOR-Y12B-4.0-4.5	JC22855-19A	TRICHLOROETHYLENE	U	0.63J	0.63	1.2	Qualify	1
P4-FOR-Y12B-4.0-4.5	JC22855-19A	M+P-XYLENE	U	0.61J	0.61	1.2	Qualify	1
P4-FOR-Y12B-6.0-6.5	JC22855-20A	CHLOROBENZENE	U	0.27J	0.27	2.2	Qualify	1
P4-FOR-Y12B-6.0-6.5	JC22855-20A	ACETONE	U	28.0	28.0	11		
P4-FOR-Y12B-6.0-6.5	JC22855-20A	BENZENE	U	0.90	0.90	0.56		
P4-FOR-Y12B-6.0-6.5	JC22855-20A	DICHLOROMETHANE	U	0.68J	0.68	5.6	Qualify	1
P4-FOR-Y12B-6.0-6.5	JC22855-20A	CARBON DISULFIDE	U	1.0J	1.0	2.2	Qualify	1

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P4-FOR-Y12B-6.0-6.5	JC22855-20A	ISOPROPYLBENZENE	U	1.0J	1.0	2.2	Qualify	1
P4-FOR-Y12B-6.5-7.0	JC22855-21A	ETHYLBENZENE	U	10.3	10.3	2.3		
P4-FOR-Y12B-6.5-7.0	JC22855-21A	CHLOROBENZENE	U	2.2J	2.2	4.6	Qualify	1
P4-FOR-Y12B-6.5-7.0	JC22855-21A	XYLENES	U	6.5	6.5	2.3		
P4-FOR-Y12B-6.5-7.0	JC22855-21A	ACETONE	U	90.0	90.0	23		
P4-FOR-Y12B-6.5-7.0	JC22855-21A	BENZENE	U	12.2	12.2	1.2		
P4-FOR-Y12B-6.5-7.0	JC22855-21A	DICHLOROMETHANE	U	2.3J	2.3	12	Qualify	1
P4-FOR-Y12B-6.5-7.0	JC22855-21A	CARBON DISULFIDE	U	5.0	5.0	4.6		
P4-FOR-Y12B-6.5-7.0	JC22855-21A	O-XYLENE	U	4.0	4.0	2.3		
P4-FOR-Y12B-6.5-7.0	JC22855-21A	1,2-DICHLOROBENZENE	U	0.56J	0.56	2.3	Qualify	1
P4-FOR-Y12B-6.5-7.0	JC22855-21A	ISOPROPYLBENZENE	U	6.3	6.3	4.6		
P4-FOR-Y12B-6.5-7.0	JC22855-21A	M+P-XYLENE	U	2.5	2.5	2.3		
P4-FOR-Y12B-7.0-7.5	JC22855-22A	METHYL-TERT-BUTYL ETHER	U	0.39J	0.39	1.0	Qualify	1
P4-FOR-Y12B-7.0-7.5	JC22855-22A	ACETONE	U	21.1	21.1	10		
P4-FOR-Y12B-7.0-7.5	JC22855-22A	DICHLOROMETHANE	U	0.90J	0.90	5.2	Qualify	1

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

NJDEP Laboratory Footnote

1. The reported result was greater than the MDL but less than the RL and therefore was estimated.
2. The reported result was qualified because of low MS recovery.
3. The reported result was qualified because of poor field duplicate precision.

Soil Target Analyte Summary Hit List (SVOCs)

Site Name PPG-Forrest PDI
Sampling Date June 23, 2016
Lab Name/ID SGS/Accutest, Dayton, NJ
SDG No JC22855A
Sample Matrix Soil
Trip Blank ID NA
Field Blank ID FOR-FB20160623

Field Sample ID	Lab Sample ID	Analyte	Method Blank (ug/kg)	Laboratory Sample Result (ug/kg)	Validation Sample Result (ug/kg)	RL (ug/kg)	Quality Assurance Decision	NJDEP Validation Footnote
P4-FOR-CC10B-1.0-1.5	JC22855-2A	ACETOPHENONE	U	27.8J	27.8	170	Qualify	1
P4-FOR-CC10B-1.0-1.5	JC22855-2A	1,2,4,5-TETRACHLOROBENZENE	U	21.6J	21.6	170	Qualify	1
P4-FOR-CC10B-1.0-1.5	JC22855-2A	1-1'-BIPHENYL	U	14.6J	14.6	69	Qualify	1
P4-FOR-CC10B-1.0-1.5	JC22855-2A	2-METHYLNAPHTHALENE	U	64.0J	64.0	69	Qualify	1
P4-FOR-CC10B-1.0-1.5	JC22855-2A	NAPHTHALENE	U	91.2	91.2	34		
P4-FOR-CC10B-1.0-1.5	JC22855-2A	FLUORENE	U	44.3	44.3	34		
P4-FOR-CC10B-1.0-1.5	JC22855-2A	CARBAZOLE	U	43.3J	43.3	69	Qualify	1,2
P4-FOR-CC10B-1.0-1.5	JC22855-2A	PHENANTHRENE	U	477	477	34		
P4-FOR-CC10B-1.0-1.5	JC22855-2A	ACENAPHTHENE	U	43.8	43.8	34		
P4-FOR-CC10B-1.0-1.5	JC22855-2A	BENZO(A)ANTHRACENE	U	333	333	34		
P4-FOR-CC10B-1.0-1.5	JC22855-2A	DIBENZO(A,H)ANTHRACENE	U	64.7	64.7	34		
P4-FOR-CC10B-1.0-1.5	JC22855-2A	BENZO(A)PYRENE	U	328	328	34		
P4-FOR-CC10B-1.0-1.5	JC22855-2A	CHRYSENE	U	376	376	34		
P4-FOR-CC10B-1.0-1.5	JC22855-2A	ACENAPHTHYLENE	U	132	132	34	Qualify	2
P4-FOR-CC10B-1.0-1.5	JC22855-2A	BENZO(K)FLUORANTHENE	U	182	182	34		
P4-FOR-CC10B-1.0-1.5	JC22855-2A	BENZO(B)FLUORANTHENE	U	466	466	34		
P4-FOR-CC10B-1.0-1.5	JC22855-2A	FLUORANTHENE	U	664	664	34		

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P4-FOR-CC10B-1.0-1.5	JC22855-2A	INDENO(1,2,3-CD)PYRENE	U	280	280	34		
P4-FOR-CC10B-1.0-1.5	JC22855-2A	DIBENZOFURAN	U	33.4J	33.4	69	Qualify	1
P4-FOR-CC10B-1.0-1.5	JC22855-2A	BENZO(G,H,I)PERYLENE	U	272	272	34		
P4-FOR-CC10B-1.0-1.5	JC22855-2A	PYRENE	U	656	656	34		
P4-FOR-CC10B-1.0-1.5	JC22855-2A	ANTHRACENE	U	135	135	34		
P4-FOR-CC10B-1.0-1.5	JC22855-2A	HEXACHLOROBENZENE	U	144	144	69		
P4-FOR-CC10B-1.0-1.5	JC22855-2A	BIS(2-ETHYLHEXYL)PHTHALATE	U	161	161	69		
P4-FOR-CC10B-10.5-11.0	JC22855-3A	1,2,4,5-TETRACHLOROBENZENE	U	19.4J	19.4	200	Qualify	1
P4-FOR-CC10B-10.5-11.0	JC22855-3A	1-1'-BIPHENYL	U	22.9J	22.9	79	Qualify	1
P4-FOR-CC10B-10.5-11.0	JC22855-3A	NAPHTHALENE	U	38.5J	38.5	40	Qualify	1
P4-FOR-CC10B-10.5-11.0	JC22855-3A	FLUORENE	U	39.1J	39.1	40	Qualify	1
P4-FOR-CC10B-10.5-11.0	JC22855-3A	PHENANTHRENE	U	292	292	40		
P4-FOR-CC10B-10.5-11.0	JC22855-3A	ACENAPHTHENE	U	130	130	40		
P4-FOR-CC10B-10.5-11.0	JC22855-3A	BENZO(A)ANTHRACENE	U	121	121	40		
P4-FOR-CC10B-10.5-11.0	JC22855-3A	BENZO(A)PYRENE	U	76.8	76.8	40		
P4-FOR-CC10B-10.5-11.0	JC22855-3A	CHRYSENE	U	119	119	40		
P4-FOR-CC10B-10.5-11.0	JC22855-3A	ACENAPHTHYLENE	U	67.6	67.6	40	Qualify	2
P4-FOR-CC10B-10.5-11.0	JC22855-3A	BENZO(K)FLUORANTHENE	U	24.1J	24.1	40	Qualify	1
P4-FOR-CC10B-10.5-11.0	JC22855-3A	BENZO(B)FLUORANTHENE	U	71.3	71.3	40		
P4-FOR-CC10B-10.5-11.0	JC22855-3A	FLUORANTHENE	U	275	275	40		
P4-FOR-CC10B-10.5-11.0	JC22855-3A	INDENO(1,2,3-CD)PYRENE	U	35.1J	35.1	40	Qualify	1
P4-FOR-CC10B-10.5-11.0	JC22855-3A	DIBENZOFURAN	U	18.4J	18.4	79	Qualify	1
P4-FOR-CC10B-10.5-11.0	JC22855-3A	BENZO(G,H,I)PERYLENE	U	37.4J	37.4	40	Qualify	1
P4-FOR-CC10B-10.5-11.0	JC22855-3A	PYRENE	U	442	442	40		

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P4-FOR-CC10B-10.5-11.0	JC22855-3A	ANTHRACENE	U	97.1	97.1	40		
P4-FOR-CC10B-10.5-11.0	JC22855-3A	BIS(2-ETHYLHEXYL)PHTHALATE	U	90.0	90.0	79		
P4-FOR-CC10B-11.0-11.5	JC22855-4A	PYRENE	U	18.0J	18.0	40	Qualify	1
P4-FOR-CC10B-11.0-11.5	JC22855-4A	BIS(2-ETHYLHEXYL)PHTHALATE	U	6430	6430	400		
P4-FOR-CC10B-3.0-3.5	JC22855-5A	ANTHRACENE	U	54.8	54.8	38		
P4-FOR-CC10B-3.0-3.5	JC22855-5A	PYRENE	U	256	256	38		
P4-FOR-CC10B-3.0-3.5	JC22855-5A	BENZO(G,H,I)PERYLENE	U	70.1	70.1	38		
P4-FOR-CC10B-3.0-3.5	JC22855-5A	INDENO(1,2,3-CD)PYRENE	U	78.1	78.1	38		
P4-FOR-CC10B-3.0-3.5	JC22855-5A	BENZO(B)FLUORANTHENE	U	144	144	38		
P4-FOR-CC10B-3.0-3.5	JC22855-5A	FLUORANTHENE	U	269	269	38		
P4-FOR-CC10B-3.0-3.5	JC22855-5A	BENZO(K)FLUORANTHENE	U	57.5	57.5	38		
P4-FOR-CC10B-3.0-3.5	JC22855-5A	ACENAPHTHYLENE	U	73.3	73.3	38	Qualify	2
P4-FOR-CC10B-3.0-3.5	JC22855-5A	CHRYSENE	U	131	131	38		
P4-FOR-CC10B-3.0-3.5	JC22855-5A	BENZO(A)PYRENE	U	104	104	38		
P4-FOR-CC10B-3.0-3.5	JC22855-5A	DIBENZO(A,H)ANTHRACENE	U	20.1J	20.1	38	Qualify	1
P4-FOR-CC10B-3.0-3.5	JC22855-5A	BENZO(A)ANTHRACENE	U	131	131	38		
P4-FOR-CC10B-3.0-3.5	JC22855-5A	PHENANTHRENE	U	160	160	38		
P4-FOR-CC10B-3.0-3.5	JC22855-5A	FLUORENE	U	19.3J	19.3	38	Qualify	1
P4-FOR-CC10B-3.0-3.5	JC22855-5A	NAPHTHALENE	U	44.6	44.6	38		
P4-FOR-CC10B-3.0-3.5	JC22855-5A	2-METHYLNAPHTHALENE	U	26.5J	26.5	77	Qualify	1
P4-FOR-CC10B-5.0-5.5	JC22855-6A	BIS(2-ETHYLHEXYL)PHTHALATE	U	86.1	86.1	74		
P4-FOR-CC10B-5.0-5.5	JC22855-6A	HEXACHLOROBENZENE	U	28.8J	28.8	74	Qualify	1
P4-FOR-CC10B-5.0-5.5	JC22855-6A	ANTHRACENE	U	26.1J	26.1	37	Qualify	1
P4-FOR-CC10B-5.0-5.5	JC22855-6A	PYRENE	U	89.6	89.6	37		

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P4-FOR-CC10B-5.0-5.5	JC22855-6A	BENZO(G,H,I)PERYLENE	U	55.4	55.4	37		
P4-FOR-CC10B-5.0-5.5	JC22855-6A	INDENO(1,2,3-CD)PYRENE	U	50.4	50.4	37		
P4-FOR-CC10B-5.0-5.5	JC22855-6A	BENZO(B)FLUORANTHENE	U	81.3	81.3	37		
P4-FOR-CC10B-5.0-5.5	JC22855-6A	FLUORANTHENE	U	81.1	81.1	37		
P4-FOR-CC10B-5.0-5.5	JC22855-6A	BENZO(K)FLUORANTHENE	U	30.5J	30.5	37	Qualify	1
P4-FOR-CC10B-5.0-5.5	JC22855-6A	ACENAPHTHYLENE	U	56.1	56.1	37	Qualify	2
P4-FOR-CC10B-5.0-5.5	JC22855-6A	CHRYSENE	U	71.9	71.9	37		
P4-FOR-CC10B-5.0-5.5	JC22855-6A	BENZO(A)PYRENE	U	49.1	49.1	37		
P4-FOR-CC10B-5.0-5.5	JC22855-6A	BENZO(A)ANTHRACENE	U	48.5	48.5	37		
P4-FOR-CC10B-5.0-5.5	JC22855-6A	ACENAPHTHENE	U	22.6J	22.6	37	Qualify	1
P4-FOR-CC10B-5.0-5.5	JC22855-6A	PHENANTHRENE	U	54.7	54.7	37		
P4-FOR-CC10B-5.0-5.5	JC22855-6A	FLUORENE	U	24.9J	24.9	37	Qualify	1
P4-FOR-CC10B-5.0-5.5	JC22855-6A	NAPHTHALENE	U	75.4	75.4	37		
P4-FOR-CC10B-5.0-5.5	JC22855-6A	2-METHYLNAPHTHALENE	U	50.6J	50.6	74	Qualify	1
P4-FOR-CC10B-5.0-5.5	JC22855-6A	1,2,4,5-TETRACHLOROBENZENE	U	63.0J	63.0	180	Qualify	1
P4-FOR-CC10B-7.0-7.5	JC22855-7A	BIS(2-ETHYLHEXYL)PHTHALATE	U	113	113	78		
P4-FOR-CC10B-7.0-7.5	JC22855-7A	HEXACHLOROBENZENE	U	41.0J	41.0	78	Qualify	1
P4-FOR-CC10B-7.0-7.5	JC22855-7A	ANTHRACENE	U	173	173	39		
P4-FOR-CC10B-7.0-7.5	JC22855-7A	PYRENE	U	286	286	39		
P4-FOR-CC10B-7.0-7.5	JC22855-7A	BENZO(G,H,I)PERYLENE	U	168	168	39		
P4-FOR-CC10B-7.0-7.5	JC22855-7A	INDENO(1,2,3-CD)PYRENE	U	165	165	39		
P4-FOR-CC10B-7.0-7.5	JC22855-7A	BENZO(B)FLUORANTHENE	U	274	274	39		
P4-FOR-CC10B-7.0-7.5	JC22855-7A	FLUORANTHENE	U	224	224	39		
P4-FOR-CC10B-7.0-7.5	JC22855-7A	BENZO(K)FLUORANTHENE	U	76.3	76.3	39		

Field Sample ID	Lab Sample ID	Analyte	Method Blank (ug/kg)	Laboratory Sample Result (ug/kg)	Validation Sample Result (ug/kg)	RL (ug/kg)	Quality Assurance Decision	NJDEP Validation Footnote
P4-FOR-CC10B-7.0-7.5	JC22855-7A	ACENAPHTHYLENE	U	422	422	39	Qualify	2
P4-FOR-CC10B-7.0-7.5	JC22855-7A	CHRYSENE	U	219	219	39		
P4-FOR-CC10B-7.0-7.5	JC22855-7A	BENZO(A)PYRENE	U	91.2	91.2	39		
P4-FOR-CC10B-7.0-7.5	JC22855-7A	DIBENZO(A,H)ANTHRACENE	U	45.1	45.1	39		
P4-FOR-CC10B-7.0-7.5	JC22855-7A	BENZO(A)ANTHRACENE	U	131	131	39		
P4-FOR-CC10B-7.0-7.5	JC22855-7A	ACENAPHTHENE	U	325	325	39		
P4-FOR-CC10B-7.0-7.5	JC22855-7A	PHENANTHRENE	U	361	361	39		
P4-FOR-CC10B-7.0-7.5	JC22855-7A	FLUORENE	U	159	159	39		
P4-FOR-CC10B-7.0-7.5	JC22855-7A	NAPHTHALENE	U	266	266	39		
P4-FOR-CC10B-7.0-7.5	JC22855-7A	2-METHYLNAPHTHALENE	U	120	120	78		
P4-FOR-CC10B-7.0-7.5	JC22855-7A	1-1'-BIPHENYL	U	40.6J	40.6	78	Qualify	1
P4-FOR-CC10B-7.0-7.5	JC22855-7A	1,2,4,5-TETRACHLOROBENZENE	U	121J	121	190	Qualify	1
P4-FOR-CC10B-9.0-9.5	JC22855-8A	PYRENE	U	123	123	39		
P4-FOR-CC10B-9.0-9.5	JC22855-8A	FLUORANTHENE	U	82.6	82.6	39		
P4-FOR-CC10B-9.0-9.5	JC22855-8A	CHRYSENE	U	21.0J	21.0	39	Qualify	1
P4-FOR-CC10B-9.0-9.5	JC22855-8A	BENZO(A)ANTHRACENE	U	21.7J	21.7	39	Qualify	1
P4-FOR-CC10B-9.0-9.5	JC22855-8A	ACENAPHTHENE	U	41.5	41.5	39		
P4-FOR-CC10B-9.0-9.5	JC22855-8A	PHENANTHRENE	U	72.7	72.7	39		
P4-FOR-FF9B-1.0-1.5	JC22855-9A	BIS(2-ETHYLHEXYL)PHTHALATE	U	189	189	71		
P4-FOR-FF9B-1.0-1.5	JC22855-9A	HEXACHLOROBENZENE	U	40.5J	40.5	71	Qualify	1
P4-FOR-FF9B-1.0-1.5	JC22855-9A	ANTHRACENE	U	105	105	35		
P4-FOR-FF9B-1.0-1.5	JC22855-9A	PYRENE	U	394	394	35		
P4-FOR-FF9B-1.0-1.5	JC22855-9A	BENZO(G,H,I)PERYLENE	U	225	225	35		
P4-FOR-FF9B-1.0-1.5	JC22855-9A	INDENO(1,2,3-CD)PYRENE	U	224	224	35		

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P4-FOR-FF9B-1.0-1.5	JC22855-9A	BENZO(B)FLUORANTHENE	U	373	373	35		
P4-FOR-FF9B-1.0-1.5	JC22855-9A	FLUORANTHENE	U	359	359	35		
P4-FOR-FF9B-1.0-1.5	JC22855-9A	BENZO(K)FLUORANTHENE	U	117	117	35		
P4-FOR-FF9B-1.0-1.5	JC22855-9A	ACENAPHTHYLENE	U	408	408	35	Qualify	2
P4-FOR-FF9B-1.0-1.5	JC22855-9A	CHRYSENE	U	292	292	35		
P4-FOR-FF9B-1.0-1.5	JC22855-9A	BENZO(A)PYRENE	U	188	188	35		
P4-FOR-FF9B-1.0-1.5	JC22855-9A	DIBENZO(A,H)ANTHRACENE	U	61.6	61.6	35		
P4-FOR-FF9B-1.0-1.5	JC22855-9A	BENZO(A)ANTHRACENE	U	194	194	35		
P4-FOR-FF9B-1.0-1.5	JC22855-9A	ACENAPHTHENE	U	47.3	47.3	35		
P4-FOR-FF9B-1.0-1.5	JC22855-9A	PHENANTHRENE	U	278	278	35		
P4-FOR-FF9B-1.0-1.5	JC22855-9A	FLUORENE	U	66.7	66.7	35		
P4-FOR-FF9B-1.0-1.5	JC22855-9A	CARBAZOLE	U	21.5J	21.5	71	Qualify	1,2
P4-FOR-FF9B-1.0-1.5	JC22855-9A	NAPHTHALENE	U	116	116	35		
P4-FOR-FF9B-1.0-1.5	JC22855-9A	2-METHYLNAPHTHALENE	U	85.2	85.2	71		
P4-FOR-FF9B-1.0-1.5	JC22855-9A	1-1'-BIPHENYL	U	18.5J	18.5	71	Qualify	1
P4-FOR-FF9B-1.0-1.5	JC22855-9A	1,2,4,5-TETRACHLOROBENZENE	U	24.9J	24.9	180	Qualify	1
P4-FOR-FF9B-1.0-1.5	JC22855-9A	ACETOPHENONE	U	39.5J	39.5	180	Qualify	1
P4-FOR-FF9B-11.0-11.5	JC22855-10A	BENZO(A)ANTHRACENE	U	247	247	38		
P4-FOR-FF9B-11.0-11.5	JC22855-10A	ACENAPHTHENE	U	112	112	38		
P4-FOR-FF9B-11.0-11.5	JC22855-10A	PHENANTHRENE	U	82.8	82.8	38		
P4-FOR-FF9B-11.0-11.5	JC22855-10A	FLUORENE	U	32.9J	32.9	38	Qualify	1
P4-FOR-FF9B-11.0-11.5	JC22855-10A	NAPHTHALENE	U	48.1	48.1	38		
P4-FOR-FF9B-11.0-11.5	JC22855-10A	2-METHYLNAPHTHALENE	U	27.7J	27.7	76	Qualify	1
P4-FOR-FF9B-11.0-11.5	JC22855-10A	1,2,4,5-TETRACHLOROBENZENE	U	52.5J	52.5	190	Qualify	1

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P4-FOR-FF9B-11.0-11.5	JC22855-10A	BIS(2-ETHYLHEXYL)PHTHALATE	U	858	858	76		
P4-FOR-FF9B-11.0-11.5	JC22855-10A	DI-N-OCTYL PHTHALATE	U	146	146	76		
P4-FOR-FF9B-11.0-11.5	JC22855-10A	HEXACHLOROBENZENE	U	28.9J	28.9	76	Qualify	1
P4-FOR-FF9B-11.0-11.5	JC22855-10A	ANTHRACENE	U	139	139	38		
P4-FOR-FF9B-11.0-11.5	JC22855-10A	PYRENE	U	679	679	38		
P4-FOR-FF9B-11.0-11.5	JC22855-10A	BENZO(G,H,I)PERYLENE	U	208	208	38		
P4-FOR-FF9B-11.0-11.5	JC22855-10A	INDENO(1,2,3-CD)PYRENE	U	184	184	38		
P4-FOR-FF9B-11.0-11.5	JC22855-10A	BENZO(B)FLUORANTHENE	U	282	282	38		
P4-FOR-FF9B-11.0-11.5	JC22855-10A	FLUORANTHENE	U	398	398	38		
P4-FOR-FF9B-11.0-11.5	JC22855-10A	BENZO(K)FLUORANTHENE	U	76.5	76.5	38		
P4-FOR-FF9B-11.0-11.5	JC22855-10A	ACENAPHTHYLENE	U	229	229	38	Qualify	2
P4-FOR-FF9B-11.0-11.5	JC22855-10A	CHRYSENE	U	338	338	38		
P4-FOR-FF9B-11.0-11.5	JC22855-10A	BENZO(A)PYRENE	U	330	330	38		
P4-FOR-FF9B-11.0-11.5	JC22855-10A	DIBENZO(A,H)ANTHRACENE	U	52.4	52.4	38		
P4-FOR-FF9B-11.5-12.0	JC22855-11A	BIS(2-ETHYLHEXYL)PHTHALATE	U	41.4J	41.4	81	Qualify	1
P4-FOR-FF9B-3.0-3.5	JC22855-12A	ANTHRACENE	U	94.7	94.7	39		
P4-FOR-FF9B-3.0-3.5	JC22855-12A	PYRENE	U	414	414	39		
P4-FOR-FF9B-3.0-3.5	JC22855-12A	DIBENZOFURAN	U	18.4J	18.4	78	Qualify	1
P4-FOR-FF9B-3.0-3.5	JC22855-12A	BENZO(G,H,I)PERYLENE	U	155	155	39		
P4-FOR-FF9B-3.0-3.5	JC22855-12A	INDENO(1,2,3-CD)PYRENE	U	148	148	39		
P4-FOR-FF9B-3.0-3.5	JC22855-12A	BENZO(B)FLUORANTHENE	U	250	250	39		
P4-FOR-FF9B-3.0-3.5	JC22855-12A	FLUORANTHENE	U	324	324	39		
P4-FOR-FF9B-3.0-3.5	JC22855-12A	BENZO(K)FLUORANTHENE	U	86.1	86.1	39		
P4-FOR-FF9B-3.0-3.5	JC22855-12A	ACENAPHTHYLENE	U	136	136	39	Qualify	2

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P4-FOR-FF9B-3.0-3.5	JC22855-12A	CHRYSENE	U	209	209	39		
P4-FOR-FF9B-3.0-3.5	JC22855-12A	BENZO(A)PYRENE	U	169	169	39		
P4-FOR-FF9B-3.0-3.5	JC22855-12A	DIBENZO(A,H)ANTHRACENE	U	31.8J	31.8	39	Qualify	1
P4-FOR-FF9B-3.0-3.5	JC22855-12A	BENZO(A)ANTHRACENE	U	164	164	39		
P4-FOR-FF9B-3.0-3.5	JC22855-12A	ACENAPHTHENE	U	34.9J	34.9	39	Qualify	1
P4-FOR-FF9B-3.0-3.5	JC22855-12A	PHENANTHRENE	U	332	332	39		
P4-FOR-FF9B-3.0-3.5	JC22855-12A	FLUORENE	U	72.7	72.7	39		
P4-FOR-FF9B-3.0-3.5	JC22855-12A	CARBAZOLE	U	16.9J	16.9	78	Qualify	1,2
P4-FOR-FF9B-3.0-3.5	JC22855-12A	NAPHTHALENE	U	101	101	39	Qualify	3
P4-FOR-FF9B-3.0-3.5	JC22855-12A	2-METHYLNAPHTHALENE	U	66.1J	66.1	78	Qualify	1
P4-FOR-FF9B-3.0-3.5X	JC22855-13A	ANTHRACENE	U	119	119	39		
P4-FOR-FF9B-3.0-3.5X	JC22855-13A	PYRENE	U	610	610	39		
P4-FOR-FF9B-3.0-3.5X	JC22855-13A	DIBENZOFURAN	U	17.8J	17.8	78	Qualify	1
P4-FOR-FF9B-3.0-3.5X	JC22855-13A	BENZO(G,H,I)PERYLENE	U	139	139	39		
P4-FOR-FF9B-3.0-3.5X	JC22855-13A	INDENO(1,2,3-CD)PYRENE	U	141	141	39		
P4-FOR-FF9B-3.0-3.5X	JC22855-13A	BENZO(B)FLUORANTHENE	U	260	260	39		
P4-FOR-FF9B-3.0-3.5X	JC22855-13A	FLUORANTHENE	U	460	460	39		
P4-FOR-FF9B-3.0-3.5X	JC22855-13A	BENZO(K)FLUORANTHENE	U	85.0	85.0	39		
P4-FOR-FF9B-3.0-3.5X	JC22855-13A	ACENAPHTHYLENE	U	137	137	39	Qualify	2
P4-FOR-FF9B-3.0-3.5X	JC22855-13A	CHRYSENE	U	262	262	39		
P4-FOR-FF9B-3.0-3.5X	JC22855-13A	BENZO(A)PYRENE	U	181	181	39		
P4-FOR-FF9B-3.0-3.5X	JC22855-13A	DIBENZO(A,H)ANTHRACENE	U	36.0J	36.0	39	Qualify	1
P4-FOR-FF9B-3.0-3.5X	JC22855-13A	BENZO(A)ANTHRACENE	U	213	213	39		
P4-FOR-FF9B-3.0-3.5X	JC22855-13A	ACENAPHTHENE	U	39.2	39.2	39		

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P4-FOR-FF9B-3.0-3.5X	JC22855-13A	PHENANTHRENE	U	464	464	39		
P4-FOR-FF9B-3.0-3.5X	JC22855-13A	FLUORENE	U	78.9	78.9	39		
P4-FOR-FF9B-3.0-3.5X	JC22855-13A	CARBAZOLE	U	16.5J	16.5	78	Qualify	1,2
P4-FOR-FF9B-3.0-3.5X	JC22855-13A	NAPHTHALENE	U	55.0	55.0	39	Qualify	3
P4-FOR-FF9B-3.0-3.5X	JC22855-13A	2-METHYLNAPHTHALENE	U	38.5J	38.5	78	Qualify	1
P4-FOR-FF9B-5.0-5.5	JC22855-14A	3+4-METHYLPHENOL	U	45.1J	45.1	78	Qualify	1
P4-FOR-FF9B-5.0-5.5	JC22855-14A	BIS(2-ETHYLHEXYL)PHTHALATE	U	117	117	78		
P4-FOR-FF9B-5.0-5.5	JC22855-14A	HEXACHLOROBENZENE	U	34.1J	34.1	78	Qualify	1
P4-FOR-FF9B-5.0-5.5	JC22855-14A	ANTHRACENE	U	483	483	39		
P4-FOR-FF9B-5.0-5.5	JC22855-14A	PYRENE	U	1780	1780	39		
P4-FOR-FF9B-5.0-5.5	JC22855-14A	BENZO(G,H,I)PERYLENE	U	1080	1080	39		
P4-FOR-FF9B-5.0-5.5	JC22855-14A	INDENO(1,2,3-CD)PYRENE	U	1060	1060	39		
P4-FOR-FF9B-5.0-5.5	JC22855-14A	BENZO(B)FLUORANTHENE	U	1710	1710	39		
P4-FOR-FF9B-5.0-5.5	JC22855-14A	FLUORANTHENE	U	1080	1080	39		
P4-FOR-FF9B-5.0-5.5	JC22855-14A	BENZO(K)FLUORANTHENE	U	476	476	39		
P4-FOR-FF9B-5.0-5.5	JC22855-14A	ACENAPHTHYLENE	U	1900	1900	39	Qualify	2
P4-FOR-FF9B-5.0-5.5	JC22855-14A	CHRYSENE	U	1420	1420	39		
P4-FOR-FF9B-5.0-5.5	JC22855-14A	BENZO(A)PYRENE	U	671	671	39		
P4-FOR-FF9B-5.0-5.5	JC22855-14A	DIBENZO(A,H)ANTHRACENE	U	314	314	39		
P4-FOR-FF9B-5.0-5.5	JC22855-14A	BENZO(A)ANTHRACENE	U	902	902	39		
P4-FOR-FF9B-5.0-5.5	JC22855-14A	ACENAPHTHENE	U	305	305	39		
P4-FOR-FF9B-5.0-5.5	JC22855-14A	PHENANTHRENE	U	974	974	39		
P4-FOR-FF9B-5.0-5.5	JC22855-14A	FLUORENE	U	377	377	39		
P4-FOR-FF9B-5.0-5.5	JC22855-14A	CARBAZOLE	U	41.8J	41.8	78	Qualify	1,2

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P4-FOR-FF9B-5.0-5.5	JC22855-14A	NAPHTHALENE	U	911	911	39		
P4-FOR-FF9B-5.0-5.5	JC22855-14A	2-METHYLNAPHTHALENE	U	544	544	78		
P4-FOR-FF9B-5.0-5.5	JC22855-14A	1-1'-BIPHENYL	U	111	111	78		
P4-FOR-FF9B-5.0-5.5	JC22855-14A	1,2,4,5-TETRACHLOROBENZENE	U	22.3J	22.3	190	Qualify	1
P4-FOR-FF9B-5.0-5.5	JC22855-14A	ACETOPHENONE	U	290	290	190		
P4-FOR-FF9B-7.0-7.5	JC22855-15A	BIS(2-ETHYLHEXYL)PHTHALATE	U	98.8	98.8	82		
P4-FOR-FF9B-7.0-7.5	JC22855-15A	ANTHRACENE	U	62.6	62.6	41		
P4-FOR-FF9B-7.0-7.5	JC22855-15A	PYRENE	U	241	241	41		
P4-FOR-FF9B-7.0-7.5	JC22855-15A	BENZO(G,H,I)PERYLENE	U	133	133	41		
P4-FOR-FF9B-7.0-7.5	JC22855-15A	INDENO(1,2,3-CD)PYRENE	U	137	137	41		
P4-FOR-FF9B-7.0-7.5	JC22855-15A	BENZO(B)FLUORANTHENE	U	235	235	41		
P4-FOR-FF9B-7.0-7.5	JC22855-15A	FLUORANTHENE	U	168	168	41		
P4-FOR-FF9B-7.0-7.5	JC22855-15A	BENZO(K)FLUORANTHENE	U	75.9	75.9	41		
P4-FOR-FF9B-7.0-7.5	JC22855-15A	ACENAPHTHYLENE	U	322	322	41	Qualify	2
P4-FOR-FF9B-7.0-7.5	JC22855-15A	CHRYSENE	U	220	220	41		
P4-FOR-FF9B-7.0-7.5	JC22855-15A	BENZO(A)PYRENE	U	77.1	77.1	41		
P4-FOR-FF9B-7.0-7.5	JC22855-15A	DIBENZO(A,H)ANTHRACENE	U	38.6J	38.6	41	Qualify	1
P4-FOR-FF9B-7.0-7.5	JC22855-15A	BENZO(A)ANTHRACENE	U	117	117	41		
P4-FOR-FF9B-7.0-7.5	JC22855-15A	ACENAPHTHENE	U	100	100	41		
P4-FOR-FF9B-7.0-7.5	JC22855-15A	PHENANTHRENE	U	154	154	41		
P4-FOR-FF9B-7.0-7.5	JC22855-15A	FLUORENE	U	111	111	41		
P4-FOR-FF9B-7.0-7.5	JC22855-15A	NAPHTHALENE	U	152	152	41		
P4-FOR-FF9B-7.0-7.5	JC22855-15A	2-METHYLNAPHTHALENE	U	85.6	85.6	82		
P4-FOR-FF9B-7.0-7.5	JC22855-15A	1-1'-BIPHENYL	U	23.8J	23.8	82	Qualify	1

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P4-FOR-FF9B-7.0-7.5	JC22855-15A	ACETOPHENONE	U	40.4J	40.4	200	Qualify	1
P4-FOR-FF9B-9.0-9.5	JC22855-16A	ANTHRACENE	U	43.8	43.8	38		
P4-FOR-FF9B-9.0-9.5	JC22855-16A	PYRENE	U	374	374	38		
P4-FOR-FF9B-9.0-9.5	JC22855-16A	FLUORANTHENE	U	254	254	38		
P4-FOR-FF9B-9.0-9.5	JC22855-16A	ACENAPHTHYLENE	U	20.4J	20.4	38	Qualify	1
P4-FOR-FF9B-9.0-9.5	JC22855-16A	CHRYSENE	U	24.7J	24.7	38	Qualify	1
P4-FOR-FF9B-9.0-9.5	JC22855-16A	BENZO(A)ANTHRACENE	U	19.4J	19.4	38	Qualify	1
P4-FOR-FF9B-9.0-9.5	JC22855-16A	ACENAPHTHENE	U	197	197	38		
P4-FOR-FF9B-9.0-9.5	JC22855-16A	PHENANTHRENE	U	19.0J	19.0	38	Qualify	1
P4-FOR-FF9B-9.0-9.5	JC22855-16A	NAPHTHALENE	U	17.1J	17.1	38	Qualify	1
P4-FOR-FF9B-9.0-9.5	JC22855-16A	2-CHLOROPHENOL	U	26.8J	26.8	77	Qualify	1
P4-FOR-Y12B-0.5-1.0	JC22855-17A	PHENOL	U	59.0J	59.0	77	Qualify	1
P4-FOR-Y12B-0.5-1.0	JC22855-17A	BIS(2-ETHYLHEXYL)PHTHALATE	U	58.7J	58.7	77	Qualify	1
P4-FOR-Y12B-0.5-1.0	JC22855-17A	HEXACHLOROBENZENE	U	281	281	77		
P4-FOR-Y12B-0.5-1.0	JC22855-17A	ANTHRACENE	U	522	522	39		
P4-FOR-Y12B-0.5-1.0	JC22855-17A	PYRENE	U	3040	3040	39		
P4-FOR-Y12B-0.5-1.0	JC22855-17A	DIBENZOFURAN	U	122	122	77		
P4-FOR-Y12B-0.5-1.0	JC22855-17A	BENZO(G,H,I)PERYLENE	U	957	957	39		
P4-FOR-Y12B-0.5-1.0	JC22855-17A	INDENO(1,2,3-CD)PYRENE	U	1020	1020	39		
P4-FOR-Y12B-0.5-1.0	JC22855-17A	BENZO(B)FLUORANTHENE	U	1930	1930	39		
P4-FOR-Y12B-0.5-1.0	JC22855-17A	FLUORANTHENE	U	2210	2210	39		
P4-FOR-Y12B-0.5-1.0	JC22855-17A	BENZO(K)FLUORANTHENE	U	567	567	39		
P4-FOR-Y12B-0.5-1.0	JC22855-17A	ACENAPHTHYLENE	U	307	307	39	Qualify	2
P4-FOR-Y12B-0.5-1.0	JC22855-17A	CHRYSENE	U	2060	2060	39		

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P4-FOR-Y12B-0.5-1.0	JC22855-17A	BENZO(A)PYRENE	U	1420	1420	39		
P4-FOR-Y12B-0.5-1.0	JC22855-17A	DIBENZO(A,H)ANTHRACENE	U	306	306	39		
P4-FOR-Y12B-0.5-1.0	JC22855-17A	BENZO(A)ANTHRACENE	U	1800	1800	39		
P4-FOR-Y12B-0.5-1.0	JC22855-17A	ACENAPHTHENE	U	99.9	99.9	39		
P4-FOR-Y12B-0.5-1.0	JC22855-17A	DI-N-BUTYLPHTHALATE	U	58.1J	58.1	77	Qualify	1
P4-FOR-Y12B-0.5-1.0	JC22855-17A	PHENANTHRENE	U	1460	1460	39		
P4-FOR-Y12B-0.5-1.0	JC22855-17A	FLUORENE	U	106	106	39		
P4-FOR-Y12B-0.5-1.0	JC22855-17A	CARBAZOLE	U	112	112	77	Qualify	2
P4-FOR-Y12B-0.5-1.0	JC22855-17A	NAPHTHALENE	U	258	258	39		
P4-FOR-Y12B-0.5-1.0	JC22855-17A	2-METHYLNAPHTHALENE	U	237	237	77		
P4-FOR-Y12B-0.5-1.0	JC22855-17A	1-1'-BIPHENYL	U	58.4J	58.4	77	Qualify	1
P4-FOR-Y12B-0.5-1.0	JC22855-17A	1,2,4,5-TETRACHLOROBENZENE	U	16.5J	16.5	190	Qualify	1
P4-FOR-Y12B-0.5-1.0	JC22855-17A	NITROBENZENE	U	77.4	77.4	77		
P4-FOR-Y12B-2.0-2.5	JC22855-18A	HEXACHLOROBENZENE	U	27.5J	27.5	76	Qualify	1
P4-FOR-Y12B-2.0-2.5	JC22855-18A	ANTHRACENE	U	159	159	38		
P4-FOR-Y12B-2.0-2.5	JC22855-18A	PYRENE	U	830	830	38		
P4-FOR-Y12B-2.0-2.5	JC22855-18A	DIBENZOFURAN	U	46.9J	46.9	76	Qualify	1
P4-FOR-Y12B-2.0-2.5	JC22855-18A	BENZO(G,H,I)PERYLENE	U	305	305	38		
P4-FOR-Y12B-2.0-2.5	JC22855-18A	INDENO(1,2,3-CD)PYRENE	U	337	337	38		
P4-FOR-Y12B-2.0-2.5	JC22855-18A	BENZO(B)FLUORANTHENE	U	655	655	38		
P4-FOR-Y12B-2.0-2.5	JC22855-18A	FLUORANTHENE	U	772	772	38		
P4-FOR-Y12B-2.0-2.5	JC22855-18A	BENZO(K)FLUORANTHENE	U	173	173	38		
P4-FOR-Y12B-2.0-2.5	JC22855-18A	ACENAPHTHYLENE	U	181	181	38	Qualify	2
P4-FOR-Y12B-2.0-2.5	JC22855-18A	CHRYSENE	U	566	566	38		

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P4-FOR-Y12B-2.0-2.5	JC22855-18A	BENZO(A)PYRENE	U	416	416	38		
P4-FOR-Y12B-2.0-2.5	JC22855-18A	DIBENZO(A,H)ANTHRACENE	U	95.7	95.7	38		
P4-FOR-Y12B-2.0-2.5	JC22855-18A	BENZO(A)ANTHRACENE	U	436	436	38		
P4-FOR-Y12B-2.0-2.5	JC22855-18A	ACENAPHTHENE	U	49.0	49.0	38		
P4-FOR-Y12B-2.0-2.5	JC22855-18A	PHENANTHRENE	U	550	550	38		
P4-FOR-Y12B-2.0-2.5	JC22855-18A	FLUORENE	U	57.1	57.1	38		
P4-FOR-Y12B-2.0-2.5	JC22855-18A	CARBAZOLE	U	46.3J	46.3	76	Qualify	1,2
P4-FOR-Y12B-2.0-2.5	JC22855-18A	NAPHTHALENE	U	392	392	38		
P4-FOR-Y12B-2.0-2.5	JC22855-18A	2-METHYLNAPHTHALENE	U	134	134	76		
P4-FOR-Y12B-2.0-2.5	JC22855-18A	1-1'-BIPHENYL	U	40.5J	40.5	76	Qualify	1
P4-FOR-Y12B-4.0-4.5	JC22855-19A	3+4-METHYLPHENOL	U	47.8J	47.8	78	Qualify	1
P4-FOR-Y12B-4.0-4.5	JC22855-19A	HEXACHLOROBENZENE	U	57.8J	57.8	78	Qualify	1
P4-FOR-Y12B-4.0-4.5	JC22855-19A	ANTHRACENE	U	897	897	39		
P4-FOR-Y12B-4.0-4.5	JC22855-19A	PYRENE	U	1560	1560	39		
P4-FOR-Y12B-4.0-4.5	JC22855-19A	DIBENZOFURAN	U	287	287	78		
P4-FOR-Y12B-4.0-4.5	JC22855-19A	BENZO(G,H,I)PERYLENE	U	1550	1550	39		
P4-FOR-Y12B-4.0-4.5	JC22855-19A	INDENO(1,2,3-CD)PYRENE	U	1490	1490	39		
P4-FOR-Y12B-4.0-4.5	JC22855-19A	BENZO(B)FLUORANTHENE	U	2220	2220	39		
P4-FOR-Y12B-4.0-4.5	JC22855-19A	FLUORANTHENE	U	1460	1460	39		
P4-FOR-Y12B-4.0-4.5	JC22855-19A	BENZO(K)FLUORANTHENE	U	586	586	39		
P4-FOR-Y12B-4.0-4.5	JC22855-19A	ACENAPHTHYLENE	U	845	845	39	Qualify	2
P4-FOR-Y12B-4.0-4.5	JC22855-19A	CHRYSENE	U	1280	1280	39		
P4-FOR-Y12B-4.0-4.5	JC22855-19A	BENZO(A)PYRENE	U	1840	1840	39		
P4-FOR-Y12B-4.0-4.5	JC22855-19A	DIBENZO(A,H)ANTHRACENE	U	381	381	39		

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P4-FOR-Y12B-4.0-4.5	JC22855-19A	BENZO(A)ANTHRACENE	U	1160	1160	39		
P4-FOR-Y12B-4.0-4.5	JC22855-19A	ACENAPHTHENE	U	561	561	39		
P4-FOR-Y12B-4.0-4.5	JC22855-19A	PHENANTHRENE	U	1450	1450	39		
P4-FOR-Y12B-4.0-4.5	JC22855-19A	FLUORENE	U	410	410	39		
P4-FOR-Y12B-4.0-4.5	JC22855-19A	CARBAZOLE	U	212	212	78	Qualify	2
P4-FOR-Y12B-4.0-4.5	JC22855-19A	2-METHYLNAPHTHALENE	U	2520	2520	78		
P4-FOR-Y12B-4.0-4.5	JC22855-19A	1-1'-BIPHENYL	U	582	582	78		
P4-FOR-Y12B-4.0-4.5	JC22855-19A	NAPHTHALENE	U	9230	9230	200		
P4-FOR-Y12B-6.0-6.5	JC22855-20A	BIS(2-ETHYLHEXYL)PHTHALATE	U	246J	246	410	Qualify	1
P4-FOR-Y12B-6.0-6.5	JC22855-20A	HEXACHLOROBENZENE	U	214J	214	410	Qualify	1
P4-FOR-Y12B-6.0-6.5	JC22855-20A	ANTHRACENE	U	1010	1010	210		
P4-FOR-Y12B-6.0-6.5	JC22855-20A	PYRENE	U	2040	2040	210		
P4-FOR-Y12B-6.0-6.5	JC22855-20A	DIBENZOFURAN	U	393J	393	410	Qualify	1
P4-FOR-Y12B-6.0-6.5	JC22855-20A	BENZO(G,H,I)PERYLENE	U	630	630	210		
P4-FOR-Y12B-6.0-6.5	JC22855-20A	INDENO(1,2,3-CD)PYRENE	U	635	635	210		
P4-FOR-Y12B-6.0-6.5	JC22855-20A	BENZO(B)FLUORANTHENE	U	1230	1230	210		
P4-FOR-Y12B-6.0-6.5	JC22855-20A	FLUORANTHENE	U	1790	1790	210		
P4-FOR-Y12B-6.0-6.5	JC22855-20A	BENZO(K)FLUORANTHENE	U	383	383	210		
P4-FOR-Y12B-6.0-6.5	JC22855-20A	ACENAPHTHYLENE	U	641	641	210	Qualify	2
P4-FOR-Y12B-6.0-6.5	JC22855-20A	CHRYSENE	U	1070	1070	210		
P4-FOR-Y12B-6.0-6.5	JC22855-20A	BENZO(A)PYRENE	U	894	894	210		
P4-FOR-Y12B-6.0-6.5	JC22855-20A	DIBENZO(A,H)ANTHRACENE	U	175J	175	210	Qualify	1
P4-FOR-Y12B-6.0-6.5	JC22855-20A	BENZO(A)ANTHRACENE	U	859	859	210		
P4-FOR-Y12B-6.0-6.5	JC22855-20A	ACENAPHTHENE	U	866	866	210		

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P4-FOR-Y12B-6.0-6.5	JC22855-20A	PHENANTHRENE	U	1300	1300	210		
P4-FOR-Y12B-6.0-6.5	JC22855-20A	FLUORENE	U	405	405	210		
P4-FOR-Y12B-6.0-6.5	JC22855-20A	NAPHTHALENE	U	4180	4180	210		
P4-FOR-Y12B-6.0-6.5	JC22855-20A	2-METHYLNAPHTHALENE	U	2510	2510	410		
P4-FOR-Y12B-6.0-6.5	JC22855-20A	1-1'-BIPHENYL	U	553	553	410		
P4-FOR-Y12B-6.5-7.0	JC22855-21A	ANTHRACENE	U	176	176	47		
P4-FOR-Y12B-6.5-7.0	JC22855-21A	PYRENE	U	428	428	47		
P4-FOR-Y12B-6.5-7.0	JC22855-21A	DIBENZOFURAN	U	74.9J	74.9	94	Qualify	1
P4-FOR-Y12B-6.5-7.0	JC22855-21A	BENZO(G,H,I)PERYLENE	U	149	149	47		
P4-FOR-Y12B-6.5-7.0	JC22855-21A	INDENO(1,2,3-CD)PYRENE	U	133	133	47		
P4-FOR-Y12B-6.5-7.0	JC22855-21A	BENZO(B)FLUORANTHENE	U	279	279	47		
P4-FOR-Y12B-6.5-7.0	JC22855-21A	FLUORANTHENE	U	293	293	47		
P4-FOR-Y12B-6.5-7.0	JC22855-21A	BENZO(K)FLUORANTHENE	U	80.8	80.8	47		
P4-FOR-Y12B-6.5-7.0	JC22855-21A	ACENAPHTHYLENE	U	176	176	47		
P4-FOR-Y12B-6.5-7.0	JC22855-21A	CHRYSENE	U	234	234	47		
P4-FOR-Y12B-6.5-7.0	JC22855-21A	BENZO(A)PYRENE	U	195	195	47		
P4-FOR-Y12B-6.5-7.0	JC22855-21A	DIBENZO(A,H)ANTHRACENE	U	35.2J	35.2	47	Qualify	1
P4-FOR-Y12B-6.5-7.0	JC22855-21A	BENZO(A)ANTHRACENE	U	204	204	47		
P4-FOR-Y12B-6.5-7.0	JC22855-21A	ACENAPHTHENE	U	177	177	47		
P4-FOR-Y12B-6.5-7.0	JC22855-21A	PHENANTHRENE	U	378	378	47		
P4-FOR-Y12B-6.5-7.0	JC22855-21A	FLUORENE	U	184	184	47		
P4-FOR-Y12B-6.5-7.0	JC22855-21A	CARBAZOLE	U	39.6J	39.6	94	Qualify	1
P4-FOR-Y12B-6.5-7.0	JC22855-21A	NAPHTHALENE	U	2180	2180	47		
P4-FOR-Y12B-6.5-7.0	JC22855-21A	2-METHYLNAPHTHALENE	U	249	249	94		

Field Sample ID	Lab Sample ID	Analyte	Method Blank (ug/kg)	Laboratory Sample Result (ug/kg)	Validation Sample Result (ug/kg)	RL (ug/kg)	Quality Assurance Decision	NJDEP Validation Footnote
P4-FOR-Y12B-6.5-7.0	JC22855-21A	1-1'-BIPHENYL	U	127	127	94		
P4-FOR-Y12B-7.0-7.5	JC22855-22A	NAPHTHALENE	U	19.7J	19.7	40	Qualify	1

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

NJDEP Laboratory Footnote

1. The reported result was greater than the MDL but less than the RL and therefore was estimated.
2. The reported result was qualified because of high LCS recovery.
3. The reported result was qualified because of poor field duplicate precision.

Attachment B

Data Validation Report Form

Client Name: PPG Industries				Project Number: 60314351 GA.DE.PDI.FOR			
Site Location: PPG-Forrest PDI, Jersey City, NJ				Project Manager: Aimee Ruitter			
Laboratory: SGS/Accutest, Dayton, NJ				Type of Validation: Limited			
Laboratory Job No: JC22855A				Date Checked: 08/29/2016			
Validator: Kristin Rutherford				Peer: Mary Kozik			
ITEM	YES	NO	N/A	COMMENTS			
Sample results included?	X						
Reporting Limits met project requirements?		X		See table below			
Field I.D. included?	X						
Laboratory I.D. included?	X						
Did data package sample IDs match sample IDs on COC?	X						
Did electronic data deliverable (EDD) sample IDs match COC sample IDs?	X						
Did data package sample IDs match electronic data deliverable (EDD) sample IDs?	X						
Sample matrix included?	X						
Sample receipt temperature 2-6°C?	X			4.0° C			
Signed COCs included?	X						
Date of sample collection included?	X						
Date of sample digestion included?	X						
Date of analysis included?	X						
Holding time met QC criteria? (Metals -180 days from sample collection; Mercury - 28 days from sample collection. If HT exceeded by 10 days R all results.	X						
Method reference included?	X						
Laboratory Case Narrative included?	X						
Definitions: MDL - Method Detection Limit; %R - Percent Recovery; RL - Reporting Limit; RPD - Relative Percent Difference; RSD - Relative Standard Deviation :Corr - Correlation Coefficient.							

ITEM	YES	NO	N/A	COMMENTS
Sample dilutions?	X			see table below
Initial calibration documentation included in lab package?			X	N/A for Limited Validation
1) Calibrate daily or each time instrument is set up.			X	
2) ICP (6010) -Blank plus 1 standard?			X	
3) Hg (7470/7471) -Blank plus 5 standards?			X	
Initial Calibration Verification Standard (ICV) for ICP (6010) and Initial Calibration Check Standard (ICCS) for Hg (7470/7471) included in lab package?			X	N/A for Limited Validation
1) Analyzed immediately after initial calibration?			X	
2) %R criteria met? (90-110%)			X	
3) Spot check ICV/ICCS results for several analytes.			X	
Continuing Calibration Verification Standard (CCV) for ICP (6010) and Calibration Check Standard (CCS) for Hg (7470/7471) included in Lab Package?			X	N/A for Limited Validation
1) Analyzed immediately after each ICV/ICC/CB and after every 10 samples?			X	
2) CCS and CCV from independent source and at mid- level of calibration curve.			X	
3) %R criteria met? (90-110%R).			X	
4) Spot check CCV/CCS results for several analytes.			X	
Low Calibration Standard (CRI) included in Lab Package?			X	N/A for Limited Validation
1) %R criteria met?			X	
Calibration Blanks			X	N/A for Limited Validation
1) Analyzed after daily calibration and after each ICV/ICC/CCV/CCS and after every 10 samples?			X	
2) Absolute value <3xIDL?			X	
Method Blank Included in Lab Package?	X			
1) Method blank analyzed with each preparation batch or every SDG, or 1/20 samples?	X			
2) Method blank analyzed 1/20 samples	X			
3) MB results nondetect?		X		see table below
4) Negative MB result reported?		X		
Field Blanks/Equipment Blanks Included in Lab Package?	X			FOR-FB20160623

ITEM	YES	NO	N/A	COMMENTS
1) FB/EB result non-detect?		X		see table below
ICP Interference Check Sample (ICS) included in Lab Package?			X	N/A for Limited Validation
1) Analyzed at beginning of analytical run?			X	
2) %R criteria met? (80-120%)			X	
3) Spot check accuracy of %Rs			X	
Matrix Spike/Matrix Spike Duplicate Data Included in Lab Package?	X			P4-FOR-CC10B-3.0-3.5 (JC22855-5A) Other MS analyses performed on non-site samples. Results for batch QC samples JC22855-2A thru -21A were qualified.
1) MS/MSD %R (75-125%R) and RPD (20%) criteria met?		X		See table below.
2) Was a sample spiked at the frequency of 1/batch or 20 samples?	X			
3) Was the MS performed on a site sample?	X			MS on site sample for one batch. Second prep batch used non-site sample; not assessed.
4) Was the MS performed on a FB/EB or TB?		X		
Post Digestion Spike			X	N/A for Limited Validation
1) %R criteria met? (75-125%R)			X	
2) Was the spike performed on a FB/EB or TB?			X	
3) Was a sample spiked at the frequency of 1/batch or 20 samples?			X	
Laboratory Duplicate Data Included in Lab Package?		X		
Aqueous - RPD criteria met? (20%)			X	
Soil - RPD criteria met? (35%)			X	
Was a Laboratory Control Sample (LCS) Included in Lab Package?	X			
1) LCS %R criteria met? (80-120%R).	X			
2) Was an LCS analyzed at the frequency of 1/batch or 20 samples?	X			
Serial Dilution			X	N/A for Limited Validation
1) %D (<10%R) criteria met? -			X	
2) Was the frequency 1/batch or 20 samples?			X	
3) Was a site sample used?			X	
4) Was a FB/EB or TB used?			X	

ITEM	YES	NO	N/A	COMMENTS
5) Spot check accuracy of %Ds.			X	
Field Duplicate Data included in Lab Package?	X			P4-FOR-FF9B-3.0-3.5 and P4-FOR-FF9B-3.0-3.5X
Aqueous - RPD criteria met? (20%)			X	
Soil - RPD criteria met? (35%)		X		See table below. Qualify (J/UJ) Hg in all soil samples in this SDG. NOTE: there were 21 soil samples in this SDG. Based on professional judgment, all were qualified.
Percent Solids data included in Lab Package?	X			
1) % Solids criteria (Reg 2 criteria) met? (>=50%)	X			
Chromium result greater than corresponding hexavalent chromium result where applicable?	X			Hexavalent chromium reported in JC22855,R

Blanks

Analyte	Result	3X	10X	Actions	Associated Samples
Soil Method Blank MP94554	(mg/kg)	(mg/kg)	(mg/kg)		
Aluminum	2.3	6.9	23.0	OK, >10X MB	JC22855-2A through -21A
Calcium	2.7	8.1	27.0	OK, >10X MB	JC22855-2A through -21A
Chromium	0.13	0.39	1.3	OK, >10X MB	JC22855-2A through -21A
Iron	1.9	5.7	19.3	OK, >10X MB	JC22855-2A through -21A
Manganese	0.050	0.15	0.50	OK, >10X MB	JC22855-2A through -21A
Silver	-0.13	0.39	1.3	Qualify (J) results <10X neg drift in samples JC22855-2A, 6A, 7A, 12A, 13A, 14A, 15A, 17A, 18A, 20A, and qualify (UJ) ND results in samples JC22855-3A, 4A, 5A, 8A, 10A, 11A, 16A, 19A, 21A. No quals for results >10X neg drift in samples JC22855-9A.	JC22855-2A through -21A
Soil Method Blank MP94555	(mg/kg)	(mg/kg)	(mg/kg)		
Aluminum	5.2	15.6	52.0	OK, >10X MB	JC22855-22A
Beryllium	0.029	0.087	0.29	OK, >10X MB	JC22855-22A
Calcium	7.2	21.6	72.0	OK, >10X MB	JC22855-22A
Iron	3.2	9.6	32.0	OK, >10X MB	JC22855-22A
Lead	0.65	1.95	6.5	OK, >10X MB	JC22855-22A
Manganese	0.078	0.23	0.78	OK, >10X MB	JC22855-22A
Zinc	0.31	0.39	3.1	OK, >10X MB	JC22855-22A
Soil Method Blank MP94642	(mg/kg)	(mg/kg)	(mg/kg)		
Mercury	0.0085	0.026	0.085	Negate (UB) results <3X MB in samples JC22855-3A, 4A, 8A, 16A. Qualify (JB) results >3X but <10X MB in samples JC22855-6A, 9A, 10A.	JC22855-2A through -21A
Aqueous Method Blank MP94541	(ug/l)	(ug/l)	(ug/l)		
Sodium	33.4	100	334	Qualify (JB) since result >3X but <10X MB	FOR-FB20160623

Analyte	Result	Converted Result*	3X	10X	Actions	Associated Samples
Equipment Blank FOR-FB20160623	(ug/l)	(mg/kg)	(mg/kg)	(mg/kg)		
Barium	1.7 B	0.17	0.51	1.7	OK, >10x FB	all soil samples in this data set
Calcium	78.8 B	7.88	23.7	78.8	OK, >10x FB	all soil samples in this data set
Manganese	0.80 B	0.080	0.24	0.80	OK, >10x FB	all soil samples in this data set
Nickel	1.0 B	0.10	0.30	1.0	OK, >10x FB	all soil samples in this data set
Sodium	139 B	13.9	41.7	139	Qualify (J) results >3x but <10X EB in samples JC22855-4A, 7A, 8A, 10A, 11A, 16A	all soil samples in this data set
Zinc	1.4 B	0.14	0.42	1.4	OK, >10x EB	all soil samples in this data set

*Note: A nominal weight of 1g and nominal final volume of 0.10L was used to convert aqueous units (ug/L) to soils units (mg/kg) in the absence of a full data deliverable.

Matrix Spikes JC22855-5A

Analyte	MS %R	MSD %R	%R Limits	RPD	RPD Limits	Actions	Associated Samples*
Aluminum	113.7	160.5	75-125	11.8	20	Qualify (J)	JC22855-2A through -21A
Antimony	68.1	69.4	75-125	1.8	20	Qualify (J/UJ)	JC22855-2A through -21A
Iron	60.5	144.1	75-125	19.8	20	Qualify (J/UJ) (one high, one low)	JC22855-2A through -21A

*A second MS/MSD was performed on a non-site sample and was associated with sample JC22855-22A from this site. This batch QC was not assessed.

Field Duplicates P4-FOR-FF9B-3.0-3.5 and P4-FOR-FF9B-3.0-3.5X

Analyte	Sample Result	Lab Qual	FD Result	Lab Qual	RL	5XRL	Abs Diff	Actions
Cadmium	0.28	B	0.53	B	0.60	3.0	0.25	None, both results <5XRL, absolute diff <RL
Mercury	0.16		0.45		0.038	0.19	0.29	One result <5XRL, the other >5XRL, and abs diff >2XRL. Qualify (J/UJ) results in all soil samples in this SDG.

Sample Dilutions

Sample	Lab ID	Dilution	Analyte
P4-FOR-FF9B-1.0-1.5	JC22855-9A	10	Beryllium
		10	Chromium
		2	Iron
		10	Lead
		20	Manganese
		10	Selenium
		2	Silver
		20	Thallium
		10	Vanadium
		10	Zinc
P4-FOR-Y12B-0.5-1.0	JC22855-17A	2	Chromium
		5	Mercury
P4-FOR-Y12B-2.0-2.5	JC22855-18A	2	Cadmium
		2	Copper
		2	Iron
		2	Lead
		2	Mercury
		2	Selenium
P4-FOR-Y12B-2.0-2.5	JC22855-18A	2	Silver
		2	Thallium
P4-FOR-Y12B-6.0-6.5	JC22855-20A	2	Antimony
		2	Chromium
		2	Vanadium
		2	Zinc

Metals Reporting Limits

Sample ID	Lab ID	Analyte	Result	Detect Flag	Units	DIGWSSL Action Level	RDCSRS Action level
P4-FOR-FF9B-1.0-1.5	JC22855-9A	THALLIUM	8.1	N	mg/kg	3	5

Client Name: PPG Industries		Project Number: 60314351 GA.DE.PDI.FOR		
Site Location: PPG-Forrest PDI, Jersey City, NJ		Project Manager: Aimee Ruitter		
Laboratory: Accutest, Dayton, NJ		Type of Validation: Limited		
Laboratory Job No: JC22855A		Date Checked: 08/29/2016		
Validator: Kristin Rutherford		Peer: Mary Kozik/AECOM		
ITEM	YES	NO	N/A	COMMENTS
Sample results included?	X			
Reporting Limits met project requirements?		X		See nonconformance tables.
Field I.D. included?	X			
Laboratory I.D. included?	X			
Did data package sample IDs match sample IDs on COC?	X			
Did electronic data deliverable (EDD) sample IDs match COC sample IDs?	X			
Did data package sample IDs match electronic data deliverable (EDD) sample IDs?	X			
Sample matrix included?	X			
Sample receipt temperature 2-6°C?	X			4.0° C
Signed COCs included?	X			
Date of sample collection included?	X			
Date of analysis included?	X			
Holding time to analysis met criteria?	X			
Method reference included?	X			
Laboratory Case Narrative included?	X			
Definitions: MDL - Method Detection Limit; %R - Percent Recovery; RL - Reporting Limit; RPD - Relative Percent Difference; RSD - Relative Standard Deviation ;Corr - Correlation Coefficient.				

ITEM	YES	NO	N/A	COMMENTS
Sample dilutions?		X		No dilutions
Method Blank Included in Lab Package?	X			
1) Method blank analyzed with each preparation batch?	X			
2) Absolute value should not exceed RL.	X			
Trip Blanks/Field Blanks/Equipment Blanks Included in Lab Package?	X			FOR-FB20160623
1) TB/FB/EB results non-detect?	X			
Surrogate Data Included?	X			
1) Is %R criteria (laboratory criteria) met?	X			
Matrix Spike/Matrix Spike Duplicate Data Included in Lab Package?	X			MS analyzed JC22855-5A
1) %R and RPD (laboratory criteria) met?		X		See table below.
2) Was the spike concentration at the same concentration as the LCS?	X			
3) Was a sample spiked at the frequency of 1 per 20 samples?	X			MS performed on site sample for one of the spikes. Batch QC for other MS not assessed.
Was a Laboratory Control Sample (LCS) Included in Lab Package?	X			
1) LCS %R criteria met? (laboratory criteria)	X			
2) Was an LCS analyzed at the frequency of 1/batch or 20 samples?	X			
Field Duplicate Data included in Lab Package?	X			P4-FOR-FF9B-3.0-3.5 and P4-FOR-FF9B-3.0-3.5X
1) %RPD criteria (Reg 2 criteria) met?		X		See table below
Percent Solids data included in Lab Package?	X			
1) %Solids criteria (Reg 2 criteria) met? (>/=50%)	X			

Matrix Spikes (JC22855-5A)

Compound	MS %R	MSD %R	%R Limits	RPD	RPD Limits	Actions	Associated Samples
2-Hexanone	49	72	16-176	33	32	No qual for RPD since parent sample result ND	P4-FOR-CC10B-3.0-3.5
Methyl Acetate	229	155	26-176	45	29	None, bias is high and parent sample result ND	P4-FOR-CC10B-3.0-3.5
Methyl Tert Butyl Ether	43	46	54-129	1	25	Qualify (UJ) parent sample result	P4-FOR-CC10B-3.0-3.5

Field Duplicates**P4-FOR-FF9B-3.0-3.5 and P4-FOR-FF9B-3.0-3.5X**

Compound	Sample Result	FD Result	Units	RL	RPD	Action
ETHYLBENZENE	1.6	0.64 J	ug/kg	0.98	85.7	None, both results <4X RL and absolute difference is <RL
1,2-DICHLOROETHANE	0.98 U	0.50 J	ug/kg	0.98	64.9	None, one result <4X RL, the other ND; absolute difference is <RL
1,2-DICHLOROBENZENE	4.4	1.8	ug/kg	0.98	83.9	Qualify (J) results in FD pair

VOC Reporting Limits

Sample ID	Lab ID	Analyte	Result	Detect Flag	Units	DIGWSSL Action Level
P4-FOR-FF9B-11.0-11.5	JC22855-10A	1,1,2,2-TETRACHLOROETHANE	17	N	ug/kg	7
P4-FOR-FF9B-11.0-11.5	JC22855-10A	1,1,2-TRICHLOROETHANE	22	N	ug/kg	20
P4-FOR-FF9B-11.0-11.5	JC22855-10A	1,1-DICHLOROETHYLENE	11	N	ug/kg	8
P4-FOR-FF9B-11.0-11.5	JC22855-10A	1,2-DIBROMO-3-CHLOROPROPANE (DBCP)	34	N	ug/kg	5
P4-FOR-FF9B-11.0-11.5	JC22855-10A	1,2-DIBROMOETHANE(EDB)	17	N	ug/kg	5
P4-FOR-FF9B-11.0-11.5	JC22855-10A	1,2-DICHLOROETHANE	12	N	ug/kg	5
P4-FOR-FF9B-11.0-11.5	JC22855-10A	1,2-DICHLOROPROPANE	22	N	ug/kg	5
P4-FOR-FF9B-11.0-11.5	JC22855-10A	BROMODICHLOROMETHANE	11	N	ug/kg	5
P4-FOR-FF9B-11.0-11.5	JC22855-10A	CARBON TETRACHLORIDE	12	N	ug/kg	5
P4-FOR-FF9B-11.0-11.5	JC22855-10A	CHLORODIBROMOMETHANE	10	N	ug/kg	5
P4-FOR-FF9B-11.0-11.5	JC22855-10A	CIS-1,3-DICHLOROPROPENE	14	N	ug/kg	5
P4-FOR-FF9B-11.0-11.5	JC22855-10A	DICHLOROMETHANE	24	N	ug/kg	10

Sample ID	Lab ID	Analyte	Result	Detect Flag	Units	DIGWSSL Action Level
P4-FOR-FF9B-11.0-11.5	JC22855-10A	TETRACHLOROETHENE	20	N	ug/kg	5
P4-FOR-FF9B-11.0-11.5	JC22855-10A	TRANS-1,3-DICHLOROPROPENE	15	N	ug/kg	5
P4-FOR-FF9B-11.0-11.5	JC22855-10A	VINYL CHLORIDE	14	N	ug/kg	5
P4-FOR-FF9B-11.5-12.0	JC22855-11A	1,1,2,2-TETRACHLOROETHANE	17	N	ug/kg	7
P4-FOR-FF9B-11.5-12.0	JC22855-11A	1,1,2-TRICHLOROETHANE	23	N	ug/kg	20
P4-FOR-FF9B-11.5-12.0	JC22855-11A	1,1-DICHLOROETHYLENE	11	N	ug/kg	8
P4-FOR-FF9B-11.5-12.0	JC22855-11A	1,2-DIBROMO-3-CHLOROPROPANE (DBCP)	34	N	ug/kg	5
P4-FOR-FF9B-11.5-12.0	JC22855-11A	1,2-DIBROMOETHANE(EDB)	17	N	ug/kg	5
P4-FOR-FF9B-11.5-12.0	JC22855-11A	1,2-DICHLOROETHANE	12	N	ug/kg	5
P4-FOR-FF9B-11.5-12.0	JC22855-11A	1,2-DICHLOROPROPANE	22	N	ug/kg	5
P4-FOR-FF9B-11.5-12.0	JC22855-11A	BENZENE	8.4	N	ug/kg	5
P4-FOR-FF9B-11.5-12.0	JC22855-11A	BROMODICHLOROMETHANE	11	N	ug/kg	5
P4-FOR-FF9B-11.5-12.0	JC22855-11A	CARBON TETRACHLORIDE	12	N	ug/kg	5
P4-FOR-FF9B-11.5-12.0	JC22855-11A	CHLORODIBROMOMETHANE	11	N	ug/kg	5
P4-FOR-FF9B-11.5-12.0	JC22855-11A	CIS-1,3-DICHLOROPROPENE	14	N	ug/kg	5
P4-FOR-FF9B-11.5-12.0	JC22855-11A	DICHLOROMETHANE	24	N	ug/kg	10
P4-FOR-FF9B-11.5-12.0	JC22855-11A	TETRACHLOROETHENE	20	N	ug/kg	5
P4-FOR-FF9B-11.5-12.0	JC22855-11A	TRANS-1,3-DICHLOROPROPENE	15	N	ug/kg	5
P4-FOR-FF9B-11.5-12.0	JC22855-11A	TRICHLOROETHYLENE	13	N	ug/kg	10
P4-FOR-FF9B-11.5-12.0	JC22855-11A	VINYL CHLORIDE	14	N	ug/kg	5
P4-FOR-FF9B-5.0-5.5	JC22855-14A	1,1,2,2-TETRACHLOROETHANE	15	N	ug/kg	7
P4-FOR-FF9B-5.0-5.5	JC22855-14A	1,1-DICHLOROETHYLENE	9.6	N	ug/kg	8
P4-FOR-FF9B-5.0-5.5	JC22855-14A	1,2-DIBROMO-3-CHLOROPROPANE (DBCP)	30	N	ug/kg	5
P4-FOR-FF9B-5.0-5.5	JC22855-14A	1,2-DIBROMOETHANE(EDB)	15	N	ug/kg	5
P4-FOR-FF9B-5.0-5.5	JC22855-14A	1,2-DICHLOROETHANE	11	N	ug/kg	5
P4-FOR-FF9B-5.0-5.5	JC22855-14A	1,2-DICHLOROPROPANE	19	N	ug/kg	5
P4-FOR-FF9B-5.0-5.5	JC22855-14A	BROMODICHLOROMETHANE	9.5	N	ug/kg	5
P4-FOR-FF9B-5.0-5.5	JC22855-14A	CARBON TETRACHLORIDE	10	N	ug/kg	5
P4-FOR-FF9B-5.0-5.5	JC22855-14A	CHLORODIBROMOMETHANE	9.4	N	ug/kg	5
P4-FOR-FF9B-5.0-5.5	JC22855-14A	CIS-1,3-DICHLOROPROPENE	12	N	ug/kg	5
P4-FOR-FF9B-5.0-5.5	JC22855-14A	DICHLOROMETHANE	21	N	ug/kg	10
P4-FOR-FF9B-5.0-5.5	JC22855-14A	TETRACHLOROETHENE	18	N	ug/kg	5

Sample ID	Lab ID	Analyte	Result	Detect Flag	Units	DIGWSSL Action Level
P4-FOR-FF9B-5.0-5.5	JC22855-14A	TRANS-1,3-DICHLOROPROPENE	14	N	ug/kg	5
P4-FOR-FF9B-5.0-5.5	JC22855-14A	TRICHLOROETHYLENE	12	N	ug/kg	10
P4-FOR-FF9B-5.0-5.5	JC22855-14A	VINYL CHLORIDE	13	N	ug/kg	5
P4-FOR-FF9B-9.0-9.5	JC22855-16A	1,1,2,2-TETRACHLOROETHANE	15	N	ug/kg	7
P4-FOR-FF9B-9.0-9.5	JC22855-16A	1,1,2-TRICHLOROETHANE	21	N	ug/kg	20
P4-FOR-FF9B-9.0-9.5	JC22855-16A	1,1-DICHLOROETHYLENE	9.9	N	ug/kg	8
P4-FOR-FF9B-9.0-9.5	JC22855-16A	1,2-DIBROMO-3-CHLOROPROPANE (DBCP)	31	N	ug/kg	5
P4-FOR-FF9B-9.0-9.5	JC22855-16A	1,2-DIBROMOETHANE(EDB)	16	N	ug/kg	5
P4-FOR-FF9B-9.0-9.5	JC22855-16A	1,2-DICHLOROETHANE	11	N	ug/kg	5
P4-FOR-FF9B-9.0-9.5	JC22855-16A	1,2-DICHLOROPROPANE	20	N	ug/kg	5
P4-FOR-FF9B-9.0-9.5	JC22855-16A	BROMODICHLOROMETHANE	9.8	N	ug/kg	5
P4-FOR-FF9B-9.0-9.5	JC22855-16A	CARBON TETRACHLORIDE	11	N	ug/kg	5
P4-FOR-FF9B-9.0-9.5	JC22855-16A	CHLORODIBROMOMETHANE	9.7	N	ug/kg	5
P4-FOR-FF9B-9.0-9.5	JC22855-16A	CIS-1,3-DICHLOROPROPENE	13	N	ug/kg	5
P4-FOR-FF9B-9.0-9.5	JC22855-16A	DICHLOROMETHANE	22	N	ug/kg	10
P4-FOR-FF9B-9.0-9.5	JC22855-16A	TETRACHLOROETHENE	18	N	ug/kg	5
P4-FOR-FF9B-9.0-9.5	JC22855-16A	TRANS-1,3-DICHLOROPROPENE	14	N	ug/kg	5
P4-FOR-FF9B-9.0-9.5	JC22855-16A	TRICHLOROETHYLENE	12	N	ug/kg	10
P4-FOR-FF9B-9.0-9.5	JC22855-16A	VINYL CHLORIDE	13	N	ug/kg	5

Sample ID	Lab ID	Analyte	Result	Detect Flag	Units	RDCSRS Action level
P4-FOR-FF9B-11.0-11.5	JC22855-10A	1,2-DIBROMOETHANE(EDB)	17	N	ug/kg	8
P4-FOR-FF9B-11.5-12.0	JC22855-11A	1,2-DIBROMOETHANE(EDB)	17	N	ug/kg	8
P4-FOR-FF9B-5.0-5.5	JC22855-14A	1,2-DIBROMOETHANE(EDB)	15	N	ug/kg	8
P4-FOR-FF9B-9.0-9.5	JC22855-16A	1,2-DIBROMOETHANE(EDB)	16	N	ug/kg	8

Client Name: PPG Industries		Project Number: 60314351 GA.DE.PDI.FOR		
Site Location: PPG-Forrest PDI, Jersey City, NJ		Project Manager: Aimee Ruitter		
Laboratory: SGS/Accutest, Dayton, NJ		Type of Validation: Limited		
Laboratory Job No: JC22855A		Date Checked: 08/29/2016		
Validator: Kristin Rutherford		Peer: Mary Kozik/AECOM		
ITEM	YES	NO	N/A	COMMENTS
Sample results included?	X			
Reporting Limits met project requirements?		X		See nonconformance tables
Field I.D. included?	X			
Laboratory I.D. included?	X			
Did data package sample IDs match sample IDs on COC?	X			
Did electronic data deliverable (EDD) sample IDs match COC sample IDs?	X			
Did data package sample IDs match electronic data deliverable (EDD) sample IDs?	X			
Sample matrix included?	X			
Sample receipt temperature 2-6°C?	X			4.0° C
Signed COCs included?	X			
Date of sample collection included?	X			
Date of sample extraction included?	X			
Date of analysis included?	X			
Holding time to analysis met criteria?	X			
Method reference included?	X			
Laboratory Case Narrative included?	X			
Definitions: MDL - Method Detection Limit; %R - Percent Recovery; RL - Reporting Limit; RPD - Relative Percent Difference; RSD - Relative Standard Deviation ;Corr - Correlation Coefficient.				

ITEM	YES	NO	N/A	COMMENTS
Sample dilutions?	X			Up to 5X, see table below
Method Blank Included in Lab Package?	X			
1) Method blank analyzed with each preparation batch?	X			
2) Absolute value should not exceed RL.	X			
Trip Blanks/Field Blanks/Equipment Blanks Included in Lab Package?	X			FOR-FB20160623
1) TB/FB/EB results non-detect?	X			
Surrogate Data Included?	X			
1) Is %R criteria (laboratory criteria) met?	X			
Matrix Spike/Matrix Spike Duplicate Data Included in Lab Package?	X			JC22855-5A
1) %R and RPD (laboratory criteria) met?	X			
2) Was the spike concentration at the same concentration as the LCS?	X			
3) Was a sample spiked at the frequency of 1 per 20 samples?	X			MS performed on site sample for one of the spikes. Batch QC for other MS not assessed.
Was a Laboratory Control Sample (LCS) Included in Lab Package?	X			
1) LCS %R criteria met? (laboratory criteria)		X		LCS OP95104-BS1. See table below.
2) Was an LCS analyzed at the frequency of 1/batch or 20 samples?	X			
Field Duplicate Data included in Lab Package?	X			P4-FOR-FF9B-3.0-3.5 and P4-FOR-FF9B-3.0-3.5X
1) %RPD criteria (Reg 2 criteria) met?		X		See table below. Qualify (J) results for Naphthalene with RPD >50%.
Percent Solids data included in Lab Package?	X			
1) %Solids criteria (Reg 2 criteria) met? (>=50%)	X			

Sample Dilutions

Sample	Lab ID	Compound	Dilution
P4-FOR-CC10B-11.0-11.5	JC22855-4A	bis(2-Ethylhexyl)phthalate	1:5
P4-FOR-Y12B-4.0-4.5	JC22855-19A	Naphthalene	1:5

Laboratory Control Samples

LCS ID	Analyte	LCS % Recovery	Lower Limit	Upper Limit	Associated Samples	Actions*
OP95104-BS1	Acenaphthylene	97	54	94	JC22855-2A thru -15A, -17A thru -20A	Qualify positive results (J) in samples JC22855-2A, -3A, -5A, -6A, -7A, -9A, -10A, -12A, -13A, -14A, -15A, -17A, -18A, -19A, -20A. No actions for ND results in other samples.
	Carbazole	107	55	105	JC22855-2A thru -15A, -17A thru -20A	Qualify positive results (J) in samples JC22855-2A, -9A, -12A, -13A, -14A, -17A, -18A, -19A. No actions for ND results in other samples.
	4-Nitroaniline	110	50	107	JC22855-2A thru -15A, -17A thru -20A	No actions – bias is high and sample results ND
*Professional judgment was used in the absence of Region 2 specified guidance.						

Field Duplicates**P4-FOR-FF9B-3.0-3.5 and P4-FOR-FF9B-3.0-3.5X**

Compound	Sample Result	FD Result	Units	RL	RPD	Action
2-Methylnaphthalene	66.1	38.5	ug/kg	78	52.8	None, both results <RL and absolute difference <RL
Naphthalene	101	55	ug/kg	39	59.0	Qualify positive results (J) in samples P4-FOR-FF9B-3.0-3.5 and P4-FOR-FF9B-3.0-3.5.

SVOC Reporting Limits

Sample ID	Lab ID	Analyte	Result	Detect Flag	Units	DIGWSSL Action Level
P4-FOR-Y12B-6.0-6.5	JC22855-20A	2,4-DINITROPHENOL	780	N	ug/kg	300

Data Validation Report

Project:	PPG - Forrest PDI
Laboratory:	SGS/Accutest, Dayton, NJ
Laboratory Job No.:	JC23104
Analysis/Method:	Hexavalent Chromium SW846 3060A/7196
Validation Level:	Full
Site Location/Address:	70 Carteret Avenue, Jersey City, NJ
AECOM Project No:	60314351.GA.DE.PDI.FOR
Prepared by:	Charlene Livingston Flint /AECOM Completed on: 08/29/2016
Reviewed by:	Mary Kozik /AECOM File Name: JC23104_2016-08-29_DVReport-F

Introduction

The data were reviewed in accordance with the FSP-QAPP and the following NJDEP validation Standard Operating Procedure (SOP):

- NJDEP Office of Data Quality SOP 5.A.10, Rev 3 (September 2009), SOP for Analytical Data Validation of Hexavalent Chromium - for USEPA SW-846 Method 3060A, USEPA SW-846 Method 7196A and USEPA SW-846 Method 7199;

The results of quality control data analyzed with site samples were used to assess the overall reliability of the data. The following qualifiers were used to identify data quality issues:

- U: Indicates the analyte was not detected in the sample above the sample reporting limit.
- J: Indicates the result was an estimated value; the associated numerical value was an approximate concentration of the analyte in the sample.
- UJ: Indicates the analyte was not detected above the reporting limit and the reporting limit was approximate.
- UB: The analyte concentration is less than or equal to three (3) times the concentration in the associated method/prep blank. The presence of the analyte in the sample is negated (UB) due to laboratory contamination.
- JB: The analyte concentration is greater than three (3) times, but less than or equal to ten (10) times the concentration in the associated method/prep blank. The presence of that analyte in the sample is considered "real". The concentration is quantitatively qualified (JB) due to method blank contamination.
- R: The sample result was rejected due to serious deficiencies; the presence or absence of the analyte could not be confirmed.
- RA: The sample result was rejected but is still considered usable.

Sample Information

The samples listed below were collected by AECOM on June 28, 2016 as part of the PPG - Forrest PDI sampling at 70 Carteret Avenue, Jersey City, New Jersey. Only the samples and parameters listed below were validated.

Field ID	Laboratory ID	Matrix	Fraction
FOR-FB20160628 (Equipment Blank)	JC23104-1	Aqueous	Hexavalent Chromium
P4-FOR-HH9B-0.5-1.0	JC23104-2	Soil	Hexavalent Chromium
P4-FOR-HH9B-2.5-3.0	JC23104-3	Soil	Hexavalent Chromium
P4-FOR-HH9B-4.5-5.0	JC23104-4	Soil	Hexavalent Chromium
P4-FOR-HH9B-5.0-5.5	JC23104-5	Soil	Hexavalent Chromium
P4-FOR-JJ8B-1.0-1.5	JC23104-6	Soil	Hexavalent Chromium
P4-FOR-JJ8B-3.0-3.5	JC23104-7	Soil	Hexavalent Chromium
P4-FOR-JJ8B-3.0-3.5X (Field Duplicate of P4-FOR-JJ8B-3.0-3.5)	JC23104-8	Soil	Hexavalent Chromium
P4-FOR-JJ8B-5.0-5.5	JC23104-9	Soil	Hexavalent Chromium
P4-FOR-JJ8B-5.5-6.0	JC23104-10	Soil	Hexavalent Chromium
P4-FOR-JJ8B-6.0-6.5	JC23104-11	Soil	Hexavalent Chromium
P4-FOR-Y12BR-0.5-1.0	JC23104-12	Soil	Hexavalent Chromium

The samples were collected following the procedures detailed in the Work Order for Garfield Avenue Remedial Action (GARA) at 70 Carteret Avenue, Jersey City, NJ and the Field Sampling Plan/Quality Assurance Project Plan for Non-Residential and Residential Chromium Sites Hudson County, New Jersey (December 2011).

General Comments

The data package was complete. Quality control (QC) issues identified during validation are discussed below. Refer to the Target Analyte Summary Hit(s) in Attachment A for a listing of all detected results, qualified results, and associated qualifications, where applicable. The nonconformances for each section discussed below are presented in Attachment B.

MS Results

Sample P4-FOR-HH9B-2.5-3.0 (JC23104-3) was selected for the matrix spike (MS) analysis associated with the samples in this SDG and was used for supporting data quality recommendations. The soluble and insoluble MS recoveries were 82.9% and 92.6%, respectively; which met the quality control criteria of 75-125%. The post digestion spike (PDS) recovery was 97%, which met the PDS criteria of 85-115%. No data qualification was required on the basis of spike recoveries.

Sample Results

Reported results (flagged B by the laboratory) that were less than the reporting limit (RL), but greater than or equal to the method detection limit (MDL) are approximate values and have been qualified as estimated (J).

Data Quality and Usability

In general, these data appear to be valid and may be used for decision-making purposes. No data were rejected. Qualified results, if applicable, are presented in Attachments A and B.

Sample results reported between the MDL and RL are usable as estimated values with an unknown directional bias.

ATTACHMENTS

Attachment A: Target Analyte Summary Hitlist(s)

Attachment B: Data Validation Report Form

Attachment A

Target Analyte Summary Hitlist(s)

Soil Target Analyte Summary Hit List (Hexavalent Chromium)

Site Name PPG - Forrest PDI
Sampling Date June 28, 2016
Lab Name/ID SGS/Accutest, Dayton, NJ
SDG No JC23104
Sample Matrix Soil
Trip Blank ID NA
Field Blank ID FOR-FB20160628

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
P4-FOR-HH9B-0.5-1.0	JC23104-2	CHROMIUM (HEXAVALENT)	U	1.5	1.5	0.48		
P4-FOR-HH9B-2.5-3.0	JC23104-3	CHROMIUM (HEXAVALENT)	U	0.50	0.50	0.50		
P4-FOR-HH9B-4.5-5.0	JC23104-4	CHROMIUM (HEXAVALENT)	U	0.46B	0.46	0.48	Qualify	1
P4-FOR-HH9B-5.0-5.5	JC23104-5	CHROMIUM (HEXAVALENT)	U	0.37B	0.37	0.48	Qualify	1
P4-FOR-JJ8B-1.0-1.5	JC23104-6	CHROMIUM (HEXAVALENT)	U	0.66	0.66	0.50		
P4-FOR-JJ8B-3.0-3.5X	JC23104-8	CHROMIUM (HEXAVALENT)	U	0.34B	0.34	0.48	Qualify	1
P4-FOR-JJ8B-6.0-6.5	JC23104-11	CHROMIUM (HEXAVALENT)	U	0.37B	0.37	0.46	Qualify	1
P4-FOR-Y12BR-0.5-1.0	JC23104-12	CHROMIUM (HEXAVALENT)	U	14.2	14.2	0.48		

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

NJDEP Laboratory Footnote

1. The reported result was greater than the MDL but less than the RL and qualified (J) as estimated by the laboratory.

Attachment B

Data Validation Report Form

Client Name: PPG Industries	Project Number: 60314351.GA.DE.PDI.FOR
Site Location: PPG - Forrest PDI, Jersey City, NJ	Project Manager: Aimee Ruiter
Laboratory: SGS/Accutest, Dayton, NJ	Type of Validation: Full
Laboratory Job No: JC23104	Date Checked: 08/29/2016
Validator: Charlene Livingston Flint	Peer: Mary Kozik

ITEM	YES	NO	N/A	COMMENTS
Sample results included?	X			
Reporting Limits met project requirements?	X			
Field I.D. included?	X			
Laboratory I.D. included?	X			
Did data package sample IDs match sample IDs on COC?	X			
Did electronic data deliverable (EDD) sample IDs match COC sample IDs?	X			
Did data package sample IDs match electronic data deliverable (EDD) sample IDs?	X			
Sample matrix included?	X			
Sample receipt temperature 2-6°C?	X			5.2° C
Signed COCs included?	X			
Date of sample collection included?	X			
Date of sample digestion included?	X			
Holding time to digestion met criteria? (Soils -30 days from collection to digestion.)	X			
Date of analysis included?	X			
Holding time to analysis met criteria? (Soils -168 hours from digestion to analysis; Aqueous - 24 hours from collection to analysis.)	X			
Method reference included?	X			
Laboratory Case Narrative included?	X			

Definitions: MDL - Method Detection Limit; %R - Percent Recovery; RL - Reporting Limit; RPD - Relative Percent Difference; RSD - Relative Standard Deviation ;Corr - Correlation Coefficient.

ITEM	YES	NO	N/A	COMMENTS
Initial calibration documentation included in lab package?	X			
1) Blank plus 4 standards (7196A) or blank plus 3 standards (7199)	X			
2) Correlation coefficient of =0.995 (7196A) or =0.999 (7199)	X			
3) Calibrate daily or each time instrument is set up.	X			
Calibration Check Standard (CCS) for 7196A and Quality Control Sample (QCS) for 7199 Included in Lab Package?	X			
1) %R criteria met? (90 - 110%)	X			
2) Correct frequency of one per every 10 samples	X			
3) CCS and QCS from independent source and at mid- level of calibration curve	X			
Calibration Blanks	X			
1) Analyzed prior to initial calibration standards and after each CCS/QCS?	X			
2) Absolute value should not exceed MDL.	X			
Method Blank, Field Blanks and/or Equipment Blanks Included in Lab Package?	X			
1) Method blank analyzed with each preparation batch?	X			
2) Absolute value should not exceed MDL.	X			
Eh and pH Data	X			
1) Eh and pH data was included and plotted for all samples?	X			
Soluble Matrix Spike Data Included in Lab Package?	X			JC23104-3
1) Soluble Matrix %R criteria met? (75-125%R).	X			
2) Was the spike concentration 40 mg/Kg or twice the sample concentration?	X			Spiked at 49.7 mg/kg.
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	X			
Insoluble Matrix Spike Data Included in Lab Package?	X			
1) Insoluble Matrix %R criteria met? (75-125%R).	X			
2) Was the spike concentration around 400 to 800 mg/Kg?		X		Spiked at 1300 mg/kg. No impact on data.
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	X			

Post Digestion Spike	X			
1) Post Digestion Spike %R criteria met? (85-115%R).	X			
2) Was the spike concentration 40 mg/Kg or twice the sample concentration?	X			
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	X			
Sample Duplicate Data Included in Lab Package?	X			JC23104-3
1.) RPD criteria met? (RPD < 20%) if both results are $\geq 4x$ RL or control limit of \pm RL if both results are <4xRL.	X			
2) Was a sample duplicate analyzed at the frequency of 1 per batch or 20 samples?	X			
Was a Laboratory Control Sample (LCS) Included in Lab Package?	X			
1) %R criteria met? (80-120%R).	X			
2) Was an LCS analyzed at the frequency of 1/batch or 20 samples?	X			
Were any Field Duplicate samples submitted with this SDG?	X			JC23104-7 & JC23104-8
1) RPD criteria met? (RPD < 20%) if both results are $\geq 4x$ RL or control limit of \pm RL if both results are <4xRL.	X			<4xRL, Abs Diff <RL
Were all sample quantitation and reporting requirements met?	X			
1) Were all solid samples reported with percent solids > 50%?	X			
2) Were any samples analyzed or reported with dilutions?		X		
Miscellaneous Items	X			
1) For soils by 7196A, was the pH within a range of 7.0-8.0?	X			
2) For soils by 7199, was the pH within a range of 9.0-9.5?			X	
3) For aqueous by 7196A, was the pH with a range of 1.5-2.5?	X			
4) For soils (3060A), was the digestion temperature 90-95C for at least 60 minutes?	X			
5) For 7199, was each sample injected twice and was the RPD ≤ 20 ?			X	

Matrix Spikes

Sample ID	Lab ID	Analyte	Matrix Spike	% Recovery	Lower Limit	Upper Limit	PDS %	PDS Limits %
P4-FOR-HH9B-2.5-3.0	JC23104-3	CHROMIUM (HEXAVALENT)	Insoluble	92.6	75	125	97	85-115
P4-FOR-HH9B-2.5-3.0	JC23104-3	CHROMIUM (HEXAVALENT)	Soluble	82.9	75	125		

Field Duplicates

Sample ID	Duplicate ID	Analyte	Sample Result	Qual	Duplicate Result	Qual	QL	Units	RPD	Action
P4-FOR-JJ8B-3.0-3.5	P4-FOR-JJ8B-3.0-3.5X	CHROMIUM (HEXAVALENT)	0.48	U	0.34	B	0.48	mg/kg	200	SR<4xRL, Abs Diff <RL, Accept

Percent Solids

Sample ID	Percent Solids (%)	Status
P4-FOR-HH9B-0.5-1.0	83.9	ok @50%
P4-FOR-HH9B-2.5-3.0	80.8	ok @50%
P4-FOR-HH9B-4.5-5.0	83.1	ok @50%
P4-FOR-HH9B-5.0-5.5	83.9	ok @50%
P4-FOR-JJ8B-1.0-1.5	80	ok @50%
P4-FOR-JJ8B-3.0-3.5	82.6	ok @50%
P4-FOR-JJ8B-3.0-3.5X	82.5	ok @50%
P4-FOR-JJ8B-5.0-5.5	87.9	ok @50%
P4-FOR-JJ8B-5.5-6.0	89.2	ok @50%
P4-FOR-JJ8B-6.0-6.5	86.1	ok @50%
P4-FOR-Y12BR-0.5-1.0	83.9	ok @50%

SDG#: JC23104/ Method 7196

Batch: GN48632

Cr+6 ICAL 7/7/16

Soil

(p. 60 of data pkg)

X - concentration	y - response
0	0
0.01	0.008
0.05	0.04
0.1	0.082
0.3	0.243
0.5	0.411
0.8	0.643
1	0.823

(p. 60 of data pkg)

AECOM Calculated Offset	-0.0006	OK	Reported Offset	-0.0006
AECOM Slope	0.8168	OK	Reported Slope	0.8168
AECOM Calculated r	0.99989	OK	Reported r	0.99989

LCS calculation

GP98763-B1 P. 38,60

Background Absorbance	0
Total absorbance	0.697
Total absorbance - background	0.697
Instrument Concentration	0.854
Sample weight (mg/kg)	0.0025
Final Volume (L)	0.1
Dilution Factor	1

AECOM Calculated LCS Result (mg/Kg)	34.2	OK	Reported Result (mg/Kg)	34.2
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%R = Found/True*100

GP98763-B1 P. 38,60

True Value (mg/kg)	40
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AECOM Calculated %R	85.4	OK, rounding	Reported %R	85.5
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MS calculation

GP98763-S1 P. 40,41,60 JC23104-3

Background reading	0.005
Total absorbance	0.69
Total absorbance - background	0.685
Instrument Concentration	0.8393
Sample weight (mg/kg)	0.00249
Final Volume (L)	0.1
Percent solids	0.808
Dilution Factor	1

AECOM Calculated MS Result (mg/Kg)	41.7	OK	Reported Result (mg/Kg)	41.7
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%R = Found/True*100

GP98763-S1 P. 40,41,60 JC23104-3

True Value (mg/kg)	49.7
Native concentration (mg/Kg)	0.5

AECOM%R	82.9	OK	Reported %R	82.9
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Percent Solids	JC23104-3	P. 35	P4-FOR-HH9B-2.5-3.0
Empty dish weight=	26.15		
Wet weight=	32.30		
Dry weight=	31.12		
AECOM %solids =	80.8	OK	Reported %solids= 80.8

Reporting Limit	JC23104-3	P. 12,35,60	P4-FOR-HH9B-2.5-3.0
Low Standard	0.01		
Initial weight (mg/kg)	0.00258		
Final volume (L)	0.1		
Percent solids	0.808		
Dilution Factor	1		
Reporting Limit	0.5	OK	Reported RL (mg/Kg)= 0.5

Sample Calculations	JC23104-3	P. 12,35,60	P4-FOR-HH9B-2.5-3.0
Background reading	0.005		
Total absorbance	0.013		
Total absorbance - background	0.008		
Instrument Response	0.010		
Sample weight (mg/kg)	0.00258		
Final Volume (L)	0.1		
Percent solids	0.808		
Dilution Factor	1		
AECOM Calculated Result (mg/Kg)	0.50	OK	Reported Result (mg/Kg) 0.50

Data Validation Report

Project:	PPG - Forrest PDI
Laboratory:	SGS/Accutest, Dayton, NJ
Laboratory Job No.:	JC23104A
Analysis/Method:	Volatile Organic Compounds (VOCs) by GCMS/SW-846 8260C Semivolatile Organic Compounds (SVOCs) by GCMS/SW-846 8270D TAL Metals SW-846 3010A/3050B/6010C/7470A/7471B
Validation Level:	Limited
Site Location/Address:	Garfield Avenue, Jersey City, NJ
AECOM Project No:	60314351.GA.DE.PDI.FOR
Prepared by:	Kristin Rutherford /AECOM Completed on: 08/31/2016
Reviewed by:	Mary Kozik/AECOM File Name: JC23104A_2016-08-31_DVReport-F

Introduction

The data were reviewed in accordance with the FSP-QAPP and the following NJDEP and / or Region 2 validation Standard Operating Procedure(s) (SOP):

- NJDEP Office of Data Quality SOP 5.A.16, Rev 1 (May 2002), Quality Assurance Data Validation of Analytical Deliverables for Inorganics (based on USEPA SW-846 Methods);
- ICP-AES Data Validation, SOP No. HW-3a Revision 0 (July 2015);
- Mercury and Cyanide Data Validation, SOP No. HW-3c Revision 0 (July 2015);
- Low/Medium Volatile Data Validation, SOP No. HW-33A Revision 0 (July 2015);
- Semivolatile Data Validation SOP No. HW-35A Revision 0 (June 2015).

The results of quality control data analyzed with site samples were used to assess the overall reliability of the data. The following qualifiers were used to identify data quality issues:

- U: Indicates the analyte was not detected in the sample above the sample reporting limit.
- J: Indicates the result was an estimated value; the associated numerical value was an approximate concentration of the analyte in the sample.
- UJ: Indicates the analyte was not detected above the reporting limit and the reporting limit was approximate.
- UB: The analyte concentration is less than or equal to three (3) times the concentration in the associated method/prep blank. The presence of the analyte in the sample is negated (UB) due to laboratory contamination.

- JB: The analyte concentration is greater than three (3) times, but less than or equal to ten (10) times the concentration in the associated method/prep blank. The presence of that analyte in the sample is considered "real". The concentration is quantitatively qualified (JB) due to method blank contamination.
- R: The sample result was rejected due to serious deficiencies; the presence or absence of the analyte could not be confirmed.
- RA: The sample result was rejected due to NJ specific data validation QC requirements; however, the result is usable for project objectives. Refer to the Data Quality and Usability section in this data validation report for further discussion.

Sample Information

The samples listed below were collected by AECOM on June 28, 2016 as part of the PPG - Forrest PDI sampling at Garfield Avenue, Jersey City, New Jersey. Only the samples and parameters listed below were validated.

Field ID	Laboratory ID	Matrix	Fraction
FOR-FB20160628 (Equipment Blank)	JC23104-1A	Aqueous	TAL Metals, SVOCs and VOCs
P4-FOR-Y12BR-0.5-1.0	JC23104-12A	Soil	TAL Metals, SVOCs and VOCs

The samples were collected following the procedures detailed in the Work Order for Garfield Avenue Remedial Action (GARA) at Garfield Avenue, Jersey City, NJ and the Field Sampling Plan/Quality Assurance Project Plan for Non-Residential and Residential Chromium Sites Hudson County, New Jersey (December 2011).

General Comments

The data package was complete. Quality control (QC) issues identified during validation are discussed below. Refer to the Target Analyte Summary Hit(s) in Attachment A for a listing of all detected results, qualified results, and associated qualifications, where applicable. The nonconformances for each section discussed below are presented in Attachment B.

TAL Metals

Laboratory Blanks/Equipment Blanks

Aluminum, calcium, iron, manganese, and zinc were detected in the method blank (MB) associated with the soil sample in this data set. These compounds were detected in the associated soil sample at concentrations greater than ten times the amount in the method blank; therefore, no qualifications were made.

Potassium and sodium were detected in the method blank associated with aqueous equipment blank, FOR-FB20160628. The result for sodium in FOR-FB20160628 was less than three times the method blank contamination; therefore, the result was negated (UB) at the reporting limit (RL). Potassium was not detected in FOR-FB20160628; therefore, no qualification was required.

Negative instrument drift was detected for barium in the method blank associated with aqueous equipment blank, FOR-FB20160628. Barium was detected in FOR-FB20160628 at less than ten times the negative drift; therefore, the result was qualified as estimated (J) and may be biased low.

Barium, calcium, manganese, nickel, and sodium were detected in the equipment blank, FOR-FB20160628, associated with the soil sample in this data set. These compounds were detected in the associated soil sample at concentrations greater than ten times the amount in the equipment blank; therefore, no qualifications were made.

Refer to the Target Analyte Summary Hit(s) in Attachment A for a listing of all results qualified on the basis of method and equipment blank contamination. Refer to the nonconformance tables in Appendix B for a listing of blank results and associated qualification actions.

Sample Results

Reported results (flagged B by the laboratory) that were less than the RL, but greater than or equal to the method detection limit (MDL), are approximate values and have been qualified as estimated (J).

VOCs

Laboratory Blanks/Equipment Blanks

Xylenes (total) were detected in the equipment blank, FOR-FB20160628, associated with the soil sample in this data set. Xylenes (total) were not detected in the associated soil sample; therefore, no qualifications were made.

Sample Results

Reported results (flagged J by the laboratory) that were less than the RL, but greater than or equal to the MDL, are approximate values and have been qualified as estimated (J).

SVOCs

Sample Results

Reported results (flagged J by the laboratory) that were less than the RL but greater than or equal to the MDL are approximate values and have been qualified as estimated (J).

Data Quality and Usability

In general, these data appear to be valid and may be used for decision-making purposes. No data were rejected. Qualified results are presented in Attachments A and B.

The following issues were noted for this sample set:

- The result for sodium in equipment blank FOR-FB20160628 is usable as a nondetect result due to method blank contamination.
- The result for barium in equipment blank FOR-FB20160628 is usable as an estimated result that may be biased low due to negative instrument drift.
- Sample results reported between the MDL and RL were estimated with an unknown directional bias.

ATTACHMENTS

Attachment A: Target Analyte Summary Hitlist(s)

Attachment B: Data Validation Report Form

Attachment A

Target Analyte Summary Hitlist(s)

Soil Target Analyte Summary Hit List (TAL Metals)

Site Name PPG-Forrest PDI
Sampling Date June 28, 2016
Lab Name/ID SGS/Accutest, Dayton, NJ
SDG No JC23104A
Sample Matrix Soil
Trip Blank ID NA
Field Blank ID FOR-FB20160628

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
P4-FOR-Y12BR-0.5-1.0	JC23104-12A	ALUMINUM	3.9	5600	5600	60		
P4-FOR-Y12BR-0.5-1.0	JC23104-12A	ANTIMONY	U	0.96B	0.96	2.4	Qualify	1
P4-FOR-Y12BR-0.5-1.0	JC23104-12A	ARSENIC	U	15.4	15.4	2.4		
P4-FOR-Y12BR-0.5-1.0	JC23104-12A	BARIUM	U	101	101	24		
P4-FOR-Y12BR-0.5-1.0	JC23104-12A	BERYLLIUM	U	0.61	0.61	0.24		
P4-FOR-Y12BR-0.5-1.0	JC23104-12A	CADMIUM	U	1.6	1.6	0.60		
P4-FOR-Y12BR-0.5-1.0	JC23104-12A	CALCIUM METAL	3.7	5160	5160	600		
P4-FOR-Y12BR-0.5-1.0	JC23104-12A	CHROMIUM	U	564	564	1.2		
P4-FOR-Y12BR-0.5-1.0	JC23104-12A	COBALT	U	16.3	16.3	6.0		
P4-FOR-Y12BR-0.5-1.0	JC23104-12A	COPPER	U	98.5	98.5	3.0		
P4-FOR-Y12BR-0.5-1.0	JC23104-12A	IRON	3.7	32300	32300	60		
P4-FOR-Y12BR-0.5-1.0	JC23104-12A	LEAD	U	209	209	2.4		
P4-FOR-Y12BR-0.5-1.0	JC23104-12A	MAGNESIUM	U	2420	2420	600		
P4-FOR-Y12BR-0.5-1.0	JC23104-12A	MANGANESE	0.089	312	312	1.8		
P4-FOR-Y12BR-0.5-1.0	JC23104-12A	MERCURY	U	0.57	0.57	0.036		
P4-FOR-Y12BR-0.5-1.0	JC23104-12A	NICKEL	U	53.2	53.2	4.8		
P4-FOR-Y12BR-0.5-1.0	JC23104-12A	POTASSIUM	U	538B	538	1200	Qualify	1

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
P4-FOR-Y12BR-0.5-1.0	JC23104-12A	SODIUM	U	246B	246	1200	Qualify	1
P4-FOR-Y12BR-0.5-1.0	JC23104-12A	VANADIUM	U	84.6	84.6	6.0		
P4-FOR-Y12BR-0.5-1.0	JC23104-12A	ZINC	0.48	832	832	6.0		

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

NJDEP Laboratory Footnote

1. The reported result was greater than the MDL but less than the RL and therefore was estimated.

Aqueous Target Analyte Summary Hit List (TAL Metals)

Site Name PPG-Forrest PDI
Sampling Date June 28, 2016
Lab Name/ID SGS/Accutest, Dayton, NJ
SDG No JC23104A
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID FOR-FB20160628

Field Sample ID	Lab Sample ID	Analyte	Method Blank (ug/L)	Laboratory Sample Result (ug/L)	Validation Sample Result (ug/L)	RL (ug/L)	Quality Assurance Decision	NJDEP Validation Footnote
FOR-FB20160628	JC23104-1A	BARIUM	-0.50	1.3B	1.3	200	Qualify	1,3
FOR-FB20160628	JC23104-1A	CALCIUM METAL	U	69.8B	69.8	5000	Qualify	1
FOR-FB20160628	JC23104-1A	MANGANESE	U	0.80B	0.80	15	Qualify	1
FOR-FB20160628	JC23104-1A	NICKEL	U	1.0B	1.0	10	Qualify	1
FOR-FB20160628	JC23104-1A	SODIUM	54.8	98.3B		10000	Negate	2

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

NJDEP Laboratory Footnote

1. The reported result was greater than the MDL but less than the RL and therefore was estimated.
2. The value reported is less than or equal to 3x the value in the method blank. It is the policy of NJDEP-DPFSSR to negate the reported value due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
3. The reported value was qualified because of negative instrument drift.

Soil Target Analyte Summary Hit List (VOCs)

Site Name PPG-Forrest PDI
Sampling Date June 28, 2016
Lab Name/ID SGS/Accutest, Dayton, NJ
SDG No JC23104A
Sample Matrix Soil
Trip Blank ID NA
Field Blank ID FOR-FB20160628

Field Sample ID	Lab Sample ID	Analyte	Method Blank (ug/kg)	Laboratory Sample Result (ug/kg)	Validation Sample Result (ug/kg)	RL (ug/kg)	Quality Assurance Decision	NJDEP Validation Footnote
P4-FOR-Y12BR-0.5-1.0	JC23104-12A	BENZENE	U	1.2	1.2	0.55		

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

Aqueous Target Analyte Summary Hit List (VOCs)

Site Name PPG-Forrest PDI
Sampling Date June 28, 2016
Lab Name/ID SGS/Accutest, Dayton, NJ
SDG No JC23104A
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID FOR-FB20160628

Field Sample ID	Lab Sample ID	Analyte	Method Blank (ug/L)	Laboratory Sample Result (ug/L)	Validation Sample Result (ug/L)	RL (ug/L)	Quality Assurance Decision	NJDEP Validation Footnote
FOR-FB20160628	JC23104-1A	XYLENES	U	0.26J	0.26	1.0	Qualify	1

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

NJDEP Laboratory Footnote

1. The reported result was greater than the MDL but less than the RL and therefore was estimated.

Soil Target Analyte Summary Hit List (SVOCs)

Site Name PPG-Forrest PDI
Sampling Date June 28, 2016
Lab Name/ID SGS/Accutest, Dayton, NJ
SDG No JC23104A
Sample Matrix Soil
Trip Blank ID NA
Field Blank ID FOR-FB20160628

Field Sample ID	Lab Sample ID	Analyte	Method Blank (ug/kg)	Laboratory Sample Result (ug/kg)	Validation Sample Result (ug/kg)	RL (ug/kg)	Quality Assurance Decision	NJDEP Validation Footnote
P4-FOR-Y12BR-0.5-1.0	JC23104-12A	1-1'-BIPHENYL	U	55.3J	55.3	78	Qualify	1
P4-FOR-Y12BR-0.5-1.0	JC23104-12A	2-METHYLNAPHTHALENE	U	275	275	78		
P4-FOR-Y12BR-0.5-1.0	JC23104-12A	NAPHTHALENE	U	459	459	39		
P4-FOR-Y12BR-0.5-1.0	JC23104-12A	FLUORENE	U	108	108	39		
P4-FOR-Y12BR-0.5-1.0	JC23104-12A	CARBAZOLE	U	148	148	78		
P4-FOR-Y12BR-0.5-1.0	JC23104-12A	PHENANTHRENE	U	1420	1420	39		
P4-FOR-Y12BR-0.5-1.0	JC23104-12A	ACENAPHTHENE	U	112	112	39		
P4-FOR-Y12BR-0.5-1.0	JC23104-12A	BENZO(A)ANTHRACENE	U	1650	1650	39		
P4-FOR-Y12BR-0.5-1.0	JC23104-12A	DIBENZO(A,H)ANTHRACENE	U	372	372	39		
P4-FOR-Y12BR-0.5-1.0	JC23104-12A	BENZO(A)PYRENE	U	1930	1930	39		
P4-FOR-Y12BR-0.5-1.0	JC23104-12A	CHRYSENE	U	1850	1850	39		
P4-FOR-Y12BR-0.5-1.0	JC23104-12A	ACENAPHTHYLENE	U	367	367	39		
P4-FOR-Y12BR-0.5-1.0	JC23104-12A	BENZO(K)FLUORANTHENE	U	723	723	39		
P4-FOR-Y12BR-0.5-1.0	JC23104-12A	BENZO(B)FLUORANTHENE	U	2510	2510	39		
P4-FOR-Y12BR-0.5-1.0	JC23104-12A	FLUORANTHENE	U	2100	2100	39		
P4-FOR-Y12BR-0.5-1.0	JC23104-12A	INDENO(1,2,3-CD)PYRENE	U	1230	1230	39		
P4-FOR-Y12BR-0.5-1.0	JC23104-12A	DIBENZOFURAN	U	123	123	78		

Field Sample ID	Lab Sample ID	Analyte	Method Blank (ug/kg)	Laboratory Sample Result (ug/kg)	Validation Sample Result (ug/kg)	RL (ug/kg)	Quality Assurance Decision	NJDEP Validation Footnote
P4-FOR-Y12BR-0.5-1.0	JC23104-12A	BENZO(G,H,I)PERYLENE	U	1150	1150	39		
P4-FOR-Y12BR-0.5-1.0	JC23104-12A	PYRENE	U	3440	3440	39		
P4-FOR-Y12BR-0.5-1.0	JC23104-12A	ANTHRACENE	U	535	535	39		
P4-FOR-Y12BR-0.5-1.0	JC23104-12A	HEXACHLOROBENZENE	U	322	322	78		
P4-FOR-Y12BR-0.5-1.0	JC23104-12A	BIS(2-ETHYLHEXYL)PHTHALATE	U	52.6J	52.6	78	Qualify	1
P4-FOR-Y12BR-0.5-1.0	JC23104-12A	3+4-METHYLPHENOL	U	44.4J	44.4	78	Qualify	1

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

NJDEP Laboratory Footnote

- The reported result was greater than the MDL but less than the RL and therefore was estimated.

Attachment B

Data Validation Report Form

Client Name: PPG Industries				Project Number: 60314351 GA.DE.PDI.FOR			
Site Location: PPG-Forrest PDI, Jersey City, NJ				Project Manager: Aimee Ruitter			
Laboratory: SGS/Accutest, Dayton, NJ				Type of Validation: Limited			
Laboratory Job No: JC23104A				Date Checked: 08/31/2016			
Validator: Kristin Rutherford				Peer: Mary Kozik			
ITEM	YES	NO	N/A	COMMENTS			
Sample results included?	X						
Reporting Limits met project requirements?	X						
Field I.D. included?	X						
Laboratory I.D. included?	X						
Did data package sample IDs match sample IDs on COC?	X						
Did electronic data deliverable (EDD) sample IDs match COC sample IDs?	X						
Did data package sample IDs match electronic data deliverable (EDD) sample IDs?	X						
Sample matrix included?	X						
Sample receipt temperature 2-6°C?	X			5.2° C			
Signed COCs included?	X						
Date of sample collection included?	X						
Date of sample digestion included?	X						
Date of analysis included?	X						
Holding time met QC criteria? (Metals -180 days from sample collection; Mercury - 28 days from sample collection. If HT exceeded by 10 days R all results.	X						
Method reference included?	X						
Laboratory Case Narrative included?	X						
Definitions: MDL - Method Detection Limit; %R - Percent Recovery; RL - Reporting Limit; RPD - Relative Percent Difference; RSD - Relative Standard Deviation :Corr - Correlation Coefficient.							

ITEM	YES	NO	N/A	COMMENTS
Sample dilutions?		X		no dilutions
Initial calibration documentation included in lab package?			X	N/A for Limited Validation
1) Calibrate daily or each time instrument is set up.			X	
2) ICP (6010) -Blank plus 1 standard?			X	
3) Hg (7470/7471) -Blank plus 5 standards?			X	
Initial Calibration Verification Standard (ICV) for ICP (6010) and Initial Calibration Check Standard (ICCS) for Hg (7470/7471) included in lab package?			X	N/A for Limited Validation
1) Analyzed immediately after initial calibration?			X	
2) %R criteria met? (90-110%)			X	
3) Spot check ICV/ICCS results for several analytes.			X	
Continuing Calibration Verification Standard (CCV) for ICP (6010) and Calibration Check Standard (CCS) for Hg (7470/7471) included in Lab Package?			X	N/A for Limited Validation
1) Analyzed immediately after each ICV/ICC/CB and after every 10 samples?			X	
2) CCS and CCV from independent source and at mid- level of calibration curve.			X	
3) %R criteria met? (90-110%R).			X	
4) Spot check CCV/CCS results for several analytes.			X	
Low Calibration Standard (CRI) included in Lab Package?			X	N/A for Limited Validation
1) %R criteria met?			X	
Calibration Blanks			X	N/A for Limited Validation
1) Analyzed after daily calibration and after each ICV/ICC/CCV/CCS and after every 10 samples?			X	
2) Absolute value <3xIDL?			X	
Method Blank Included in Lab Package?	X			
1) Method blank analyzed with each preparation batch or every SDG, or 1/20 samples?	X			
2) Method blank analyzed 1/20 samples	X			
3) MB results nondetect?		X		see table below
4) Negative MB result reported?	X			see table below
Field Blanks/Equipment Blanks Included in Lab Package?	X			FOR-FB20160628

ITEM	YES	NO	N/A	COMMENTS
1) FB/EB result non-detect?		X		see table below; no qualifications required
ICP Interference Check Sample (ICS) included in Lab Package?			X	N/A for Limited Validation
1) Analyzed at beginning of analytical run?			X	
2) %R criteria met? (80-120%)			X	
3) Spot check accuracy of %Rs			X	
Matrix Spike/Matrix Spike Duplicate Data Included in Lab Package?	X			MS not performed on site sample; batch QC not assessed
1) MS/MSD %R (75-125%R) and RPD (20%) criteria met?			X	
2) Was a sample spiked at the frequency of 1/batch or 20 samples?			X	
3) Was the MS performed on a site sample?		X		batch QC not assessed
4) Was the MS performed on a FB/EB or TB?			X	
Post Digestion Spike			X	N/A for Limited Validation
1) %R criteria met? (75-125%R)			X	
2) Was the spike performed on a FB/EB or TB?			X	
3) Was a sample spiked at the frequency of 1/batch or 20 samples?			X	
Laboratory Duplicate Data Included in Lab Package?		X		
Aqueous - RPD criteria met? (20%)			X	
Soil - RPD criteria met? (35%)			X	
Was a Laboratory Control Sample (LCS) Included in Lab Package?	X			
1) LCS %R criteria met? (80-120%R).	X			
2) Was an LCS analyzed at the frequency of 1/batch or 20 samples?	X			
Serial Dilution			X	N/A for Limited Validation
1) %D (<10%R) criteria met? -			X	
2) Was the frequency 1/batch or 20 samples?			X	
3) Was a site sample used?			X	
4) Was a FB/EB or TB used?			X	
5) Spot check accuracy of %Ds.			X	

ITEM	YES	NO	N/A	COMMENTS
Field Duplicate Data included in Lab Package?		X		no FDs in this data set
Aqueous - RPD criteria met? (20%)			X	
Soil - RPD criteria met? (35%)			X	
Percent Solids data included in Lab Package?	X			
1) % Solids criteria (Reg 2 criteria) met? ($\geq 50\%$)	X			
Chromium result greater than corresponding hexavalent chromium result where applicable?	X			Hexavalent chromium reported in JC23104

Blanks

Analyte	Result	3X	10X	Actions	Associated Samples
Soil Method Blank MP94653	(mg/kg)	(mg/kg)	(mg/kg)		
Aluminum	3.9	11.7	39.0	OK, >10X MB	P4-FOR-Y12BR-0.5-1.0
Calcium	3.7	11.1	37.0	OK, >10X MB	P4-FOR-Y12BR-0.5-1.0
Iron	3.7	11.1	37.0	OK, >10X MB	P4-FOR-Y12BR-0.5-1.0
Manganese	0.089	0.27	0.89	OK, >10X MB	P4-FOR-Y12BR-0.5-1.0
Zinc	0.48	1.4	4.8	OK, >10X MB	P4-FOR-Y12BR-0.5-1.0
Aqueous Method Blank MP94656	(ug/l)	(ug/l)	(ug/l)		
Barium	-0.50		5.0	Qualify (J) result <10X neg drift	FOR-FB20160628
Potassium	122	366	1220	OK, result ND	FOR-FB20160628
Sodium	54.8	164	548	Negate (UB) at RL since result is <3X MB	FOR-FB20160628

Analyte	Result	Converted Result*	3X	10X	Actions	Associated Samples
Equipment Blank FOR-FB20160628	(ug/l)	(mg/kg)	(mg/kg)	(mg/kg)		
Barium	1.3 B	0.13	0.39	1.3	OK, >10x EB	P4-FOR-Y12BR-0.5-1.0
Calcium	69.8 B	6.98	20.9	69.8	OK, >10x EB	P4-FOR-Y12BR-0.5-1.0
Manganese	0.80 B	0.080	0.24	0.80	OK, >10x EB	P4-FOR-Y12BR-0.5-1.0
Nickel	1.0 B	0.10	0.30	1.0	OK, >10x EB	P4-FOR-Y12BR-0.5-1.0
Sodium	98.3 B	9.83	29.5	98.3	OK, >10x EB	P4-FOR-Y12BR-0.5-1.0

*Note: A nominal weight of 1g and nominal final volume of 0.10L was used to convert aqueous units (ug/L) to soils units (mg/kg) in the absence of a full data deliverable.

Client Name: PPG Industries		Project Number: 60314351 GA.DE.PDI.FOR		
Site Location: PPG-Forrest PDI, Jersey City, NJ		Project Manager: Aimee Ruitter		
Laboratory: Accutest, Dayton, NJ		Type of Validation: Limited		
Laboratory Job No: JC23104A		Date Checked: 08/31/2016		
Validator: Kristin Rutherford		Peer: Mary Kozik/AECOM		
ITEM	YES	NO	N/A	COMMENTS
Sample results included?	X			
Reporting Limits met project requirements?	X			
Field I.D. included?	X			
Laboratory I.D. included?	X			
Did data package sample IDs match sample IDs on COC?	X			
Did electronic data deliverable (EDD) sample IDs match COC sample IDs?	X			
Did data package sample IDs match electronic data deliverable (EDD) sample IDs?	X			
Sample matrix included?	X			
Sample receipt temperature 2-6°C?	X			5.2° C
Signed COCs included?	X			
Date of sample collection included?	X			
Date of analysis included?	X			
Holding time to analysis met criteria?	X			
Method reference included?	X			
Laboratory Case Narrative included?	X			
Definitions: MDL - Method Detection Limit; %R - Percent Recovery; RL - Reporting Limit; RPD - Relative Percent Difference; RSD - Relative Standard Deviation ;Corr - Correlation Coefficient.				

ITEM	YES	NO	N/A	COMMENTS
Sample dilutions?		X		No dilutions
Method Blank Included in Lab Package?	X			
1) Method blank analyzed with each preparation batch?	X			
2) Absolute value should not exceed RL.	X			
Trip Blanks/Field Blanks/Equipment Blanks Included in Lab Package?	X			FOR-FB20160628
1) TB/FB/EB results non-detect?		X		See table below. Xylene (total) 0.26 µg/L. No qualifications required since the associated soil result is ND.
Surrogate Data Included?	X			
1) Is %R criteria (laboratory criteria) met?	X			
Matrix Spike/Matrix Spike Duplicate Data Included in Lab Package?	X			MS not performed on site sample; batch QC not assessed
1) %R and RPD (laboratory criteria) met?			X	
2) Was the spike concentration at the same concentration as the LCS?			X	
3) Was a sample spiked at the frequency of 1 per 20 samples?			X	
Was a Laboratory Control Sample (LCS) Included in Lab Package?	X			
1) LCS %R criteria met? (laboratory criteria)	X			
2) Was an LCS analyzed at the frequency of 1/batch or 20 samples?	X			
Field Duplicate Data included in Lab Package?		X		no FDs in this data set
1) %RPD criteria (Reg 2 criteria) met?			X	
Percent Solids data included in Lab Package?	X			
1) %Solids criteria (Reg 2 criteria) met? (>=50%)	X			

Equipment Blank

Compound	Result	RL	Actions	Associated Samples
Equipment Blank FOR-FB20160628	(ug/l)	(ug/l)		
Xylene (total)	0.26	1.0	None, associated soil result ND	P4-FOR-Y12BR-0.5-1.0

Client Name: PPG Industries		Project Number: 60314351 GA.DE.PDI.FOR		
Site Location: PPG-Forrest PDI, Jersey City, NJ		Project Manager: Aimee Ruitter		
Laboratory: SGS/Accutest, Dayton, NJ		Type of Validation: Limited		
Laboratory Job No: JC23104A		Date Checked: 08/29/2016		
Validator: Kristin Rutherford		Peer: Mary Kozik/AECOM		
ITEM	YES	NO	N/A	COMMENTS
Sample results included?	X			
Reporting Limits met project requirements?	X			
Field I.D. included?	X			
Laboratory I.D. included?	X			
Did data package sample IDs match sample IDs on COC?	X			
Did electronic data deliverable (EDD) sample IDs match COC sample IDs?	X			
Did data package sample IDs match electronic data deliverable (EDD) sample IDs?	X			
Sample matrix included?	X			
Sample receipt temperature 2-6°C?	X			5.2° C
Signed COCs included?	X			
Date of sample collection included?	X			
Date of sample extraction included?	X			
Date of analysis included?	X			
Holding time to analysis met criteria?	X			
Method reference included?	X			
Laboratory Case Narrative included?	X			Note: sample JC23104-12A was re-analyzed at 2X dilution for IS. Internal stds not assessed in limited validation.
Definitions: MDL - Method Detection Limit; %R - Percent Recovery; RL - Reporting Limit; RPD - Relative Percent Difference; RSD - Relative Standard Deviation :Corr - Correlation Coefficient.				

ITEM	YES	NO	N/A	COMMENTS
Sample dilutions?	X			P4-FOR-Y12BR-0.5-1.0 (2X) for IS confirmation
Method Blank Included in Lab Package?	X			
1) Method blank analyzed with each preparation batch?	X			
2) Absolute value should not exceed RL.	X			
Trip Blanks/Field Blanks/Equipment Blanks Included in Lab Package?	X			FOR-FB20160628
1) TB/FB/EB results non-detect?	X			
Surrogate Data Included?	X			
1) Is %R criteria (laboratory criteria) met?	X			
Matrix Spike/Matrix Spike Duplicate Data Included in Lab Package?	X			MS not performed on site sample; batch QC not assessed
1) %R and RPD (laboratory criteria) met?			X	
2) Was the spike concentration at the same concentration as the LCS?			X	
3) Was a sample spiked at the frequency of 1 per 20 samples?			X	
Was a Laboratory Control Sample (LCS) Included in Lab Package?	X			
1) LCS %R criteria met? (laboratory criteria)	X			
2) Was an LCS analyzed at the frequency of 1/batch or 20 samples?	X			
Field Duplicate Data included in Lab Package?		X		no FDs in this data set
1) %RPD criteria (Reg 2 criteria) met?			X	
Percent Solids data included in Lab Package?	X			
1) %Solids criteria (Reg 2 criteria) met? (>=50%)	X			

Sample Dilutions

Sample	Lab ID	Compound	Dilution
P4-FOR-Y12BR-0.5-1.0	JC23104-12A	all – confirmation for internal standards	1:2

Data Validation Report

Project: PPG - North Forrest Street PDI

Laboratory: SGS/Accutest, Dayton, NJ

Laboratory Job No.: JC26495 and JC26495R

Analysis/Method: Hexavalent Chromium SW846 3060A/7196A/7199

Validation Level: Full

Site Location/Address: 70 Carteret Avenue

AECOM Project No: 60314351.GA.DE.PDI.NFS

Prepared by: Charlene Livingston Flint /AECOM Completed on: 09/28/2016

Reviewed by: Constance Lapite /AECOM File Name: JC26495_R_2016-09-28_DVReport-F

Introduction

The data were reviewed in accordance with the FSP-QAPP and the following NJDEP validation Standard Operating Procedure (SOP):

- NJDEP Office of Data Quality SOP 5.A.10, Rev 3 (September 2009), SOP for Analytical Data Validation of Hexavalent Chromium - for USEPA SW-846 Method 3060A, USEPA SW-846 Method 7196A and USEPA SW-846 Method 7199.

The results of quality control data analyzed with site samples were used to assess the overall reliability of the data. The following qualifiers were used to identify data quality issues:

- U: Indicates the analyte was not detected in the sample above the sample reporting limit.
- J: Indicates the result was an estimated value; the associated numerical value was an approximate concentration of the analyte in the sample.
- UJ: Indicates the analyte was not detected above the reporting limit and the reporting limit was approximate.
- UB: The analyte concentration is less than or equal to three (3) times the concentration in the associated method/prep blank. The presence of the analyte in the sample is negated (UB) due to laboratory contamination.
- JB: The analyte concentration is greater than three (3) times, but less than or equal to ten (10) times the concentration in the associated method/prep blank. The presence of that analyte in the sample is considered "real". The concentration is quantitatively qualified (JB) due to method blank contamination.
- R: The sample result was rejected due to serious deficiencies; the presence or absence of the analyte could not be confirmed.
- RA: The sample result was rejected but is still considered usable.

Sample Information

The samples listed below were collected by AECOM on August 25, 2016 as part of the PPG - North Forrest Street PDI sampling at 70 Carteret Avenue, Jersey City, New Jersey. Only the samples and parameters listed below were validated.

Field ID	Laboratory ID	Matrix	Fraction
NFS-FB20160825 (Equipment Blank)	JC26495-1	Aqueous	Hexavalent Chromium
NFS-PDI-W12B-10.0-10.5	JC26495-2	Soil	Hexavalent Chromium
NFS-PDI-W12B-10.0-10.5	JC26495-2R	Soil	Hexavalent Chromium
NFS-PDI-W12B-9.0-9.5	JC26495-3	Soil	Hexavalent Chromium
NFS-PDI-W12B-9.0-9.5	JC26495-3R	Soil	Hexavalent Chromium
NFS-PDI-W12B-9.5-10.0	JC26495-4	Soil	Hexavalent Chromium
NFS-PDI-W12B-9.5-10.0	JC26495-4R	Soil	Hexavalent Chromium
NFS-PDI-X12B-8.0-8.5	JC26495-5	Soil	Hexavalent Chromium
NFS-PDI-X12B-8.0-8.5	JC26495-5R	Soil	Hexavalent Chromium
NFS-PDI-X12B-8.5-9.0	JC26495-6	Soil	Hexavalent Chromium
NFS-PDI-X12B-8.5-9.0	JC26495-6R	Soil	Hexavalent Chromium
NFS-PDI-X12B-9.0-9.5	JC26495-7	Soil	Hexavalent Chromium
NFS-PDI-X12B-9.0-9.5	JC26495-7R	Soil	Hexavalent Chromium
NFS-PDI-X12B-9.5-10.0	JC26495-8	Soil	Hexavalent Chromium
NFS-PDI-X12B-9.5-10.0	JC26495-8R	Soil	Hexavalent Chromium

The samples were collected following the procedures detailed in the Work Order for Garfield Avenue Remedial Action (GARA) at 70 Carteret Avenue and the Field Sampling Plan/Quality Assurance Project Plan for Non-Residential and Residential Chromium Sites Hudson County, New Jersey (December 2011).

General Comments

The data package was complete. Quality control (QC) issues identified during validation are discussed below. Refer to the Target Analyte Summary Hit(s) in Attachment A for a listing of all detected results, qualified results, and associated qualifications, where applicable. The nonconformances for each section discussed below are presented in Attachment B.

MS Results

Method 7196

Sample NFS-PDI-W12B-9.5-10.0 (JC26495-4) was selected for the soil matrix spike analysis and used for supporting data quality recommendations. The soluble and insoluble matrix spike (MS) recoveries from the initial batch were 12.3% and 9.9%, respectively; which did not meet quality control (QC) criteria of 75-125%R and were less than 50%. The post digestion spike (PDS) recovery was 21.68% and after pH adjustment was 34.11%, which did not meet the PDS criteria of 85-115%.

Based on the very low MS and post-digestion spike recoveries - often an indication that Method 7199 may be more successful in producing improved matrix spike recovery, samples were reanalyzed using Method 7199.

Method 7199

Sample NFS-PDI-W12B-9.5-10.0 was again selected for the MS re-analysis associated with the samples in this SDG. The soluble and insoluble MS results from the reanalysis by method 7199 were 2.9% and 50.9%, respectively, which did not meet QC criteria of 75-125%. The PDS result was 90.4%, which was within the QC criteria of 85-115%.

Since the matrix spikes failed to meet QC criteria, additional parameters were analyzed to determine if possible matrix interferences could be the cause for the poor matrix spike recoveries. All the samples were tested for pH and oxidation reduction potential (ORP), and plotted on an Eh/pH phase diagram. From this chart, the source sample for the matrix spike analysis of sample NFS-PDI-W12B-9.5-10.0 was plotted below the phase change line, indicating reducing potential within the sample matrix, incapable of supporting hexavalent chromium. Ferrous iron, sulfide screen, and total organic carbon (TOC) were performed on this matrix spike source sample to confirm the oxidizing/reducing potential within the sample matrix. The sulfide screen was reported as nondetect, indicating no reducing agents within the sample matrix; however, the ferrous iron (2.5 %) and the TOC results (118,000 mg/Kg) were positive, indicating potential reducing agents within the sample matrix.

Since the MS recoveries from the initial and reanalysis batches did not meet QC requirements, but at least one MS recovery was greater than 50%, the highest detected hexavalent chromium result or the nondetect result with the lowest reporting limit (RL) was reported for each sample. The reported hexavalent chromium results were qualified as estimated (J/UJ) due to the poor MS recoveries.

No further qualification was taken based on the low initial PDS recovery since the reanalysis PDS %R was acceptable.

Laboratory Duplicate Precision

Sample NFS-PDI-W12B-9.5-10.0 (JC26495-4) was selected by the laboratory to demonstrate laboratory precision capabilities.

Both the sample and duplicate results were less than 4 times the reporting limit (RL). The absolute difference was greater than the absolute difference criteria of less than or equal to the RL in the initial analysis; therefore, all hexavalent chromium soil results reported from the initial analysis were qualified as estimated (J/UJ).

Percent Solids

The moisture content for NFS-PDI-W12B-10.0-10.5 (JC26495-2) and NFS-PDI-W12B-9.5-10.0 (JC26495-4) exceeded the acceptable limit of 50%; therefore, the results were qualified (J) as estimated.

Sample Results

Reported results (flagged B by the laboratory), that were less than the RL but greater than or equal to the method detection limit (MDL), are approximate values and have been qualified as estimated (J).

Data Quality and Usability

In general, these data appear to be valid and may be used for decision-making purposes. No data were rejected. Qualified results, if applicable, are presented in Attachments A and B.

The hexavalent chromium soil results in this SDG are usable as estimated values with the potential for low bias due to low soluble MS recovery and since the MS sample matrix appears to be reducing based on the Eh-pH plot and the presence of TOC and ferrous iron.

Sample results qualified due to poor laboratory duplicate precision, are usable as estimated values with an unknown directional bias.

Sample results reported between the MDL and RL, and or qualified due to high percent moisture content are usable as estimated values with an unknown directional bias.

ATTACHMENTS

Attachment A: Target Analyte Summary Hitlist(s)

Attachment B: Data Validation Report Form

Attachment A

Target Analyte Summary Hitlist(s)

Soil Target Analyte Summary Hit List (Hexavalent Chromium)

Site Name PPG - North Forrest Street PDI
Sampling Date August 25, 2016
Lab Name/ID SGS/Accutest, Dayton, NJ
SDG No JC26495 and JC26495R
Sample Matrix Soil
Trip Blank ID NA
Field Blank ID NFS-FB20160825

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
NFS-PDI-W12B-9.0-9.5	JC26495-3	CHROMIUM (HEXAVALENT)	U	U	U	0.60	Qualify	1,2
NFS-PDI-W12B-9.5-10.0	JC26495-4	CHROMIUM (HEXAVALENT)	U	3.7	3.7	0.93	Qualify	1,2,3
NFS-PDI-X12B-8.0-8.5	JC26495-5	CHROMIUM (HEXAVALENT)	U	U	U	0.62	Qualify	1,2
NFS-PDI-X12B-8.5-9.0	JC26495-6	CHROMIUM (HEXAVALENT)	U	1.1	1.1	0.63	Qualify	1,2
NFS-PDI-X12B-9.0-9.5	JC26495-7	CHROMIUM (HEXAVALENT)	U	2.2	2.2	0.68	Qualify	1,2
NFS-PDI-W12B-10.0-10.5	JC26495-2R	CHROMIUM (HEXAVALENT)	U	5.1	5.1	3.3	Qualify	1,3
NFS-PDI-X12B-9.5-10.0	JC26495-8R	CHROMIUM (HEXAVALENT)	U	0.67B	0.67	2.1	Qualify	1,4

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

NJDEP Laboratory Footnote

1. The reported value was qualified because the soluble and/or insoluble matrix recoveries were less than 75%, but greater than 50%.
2. In the laboratory duplicate sample analysis, Hexavalent Chromium fell outside the control limits of +/- RL for sample results < 4xRL. Therefore, the result was qualified.
3. The reported values were estimated because the sample moisture content was greater than 50 percent.
4. The reported result was greater than the MDL but less than the RL and therefore was estimated.

Attachment B

Data Validation Report Form

Client Name: PPG Industries	Project Number: 60314351.GA.DE.PDI.NOFFOR
Site Location: PPG - North Forrest Street PDI, Jersey City, NJ	Project Manager: Aimee Ruiter
Laboratory: SGS/Accutest, Dayton, NJ	Type of Validation: Full
Laboratory Job No: JC26495 and JC26495R	Date Checked: 09/28/2016
Validator: Charlene Livingston Flint	Peer: Constance Lapite

ITEM	YES	NO	N/A	COMMENTS
Sample results included?	X			
Reporting Limits met project requirements?	X			
Field I.D. included?	X			
Laboratory I.D. included?	X			
Did data package sample IDs match sample IDs on COC?	X			
Did electronic data deliverable (EDD) sample IDs match COC sample IDs?	X			
Did data package sample IDs match electronic data deliverable (EDD) sample IDs?	X			
Sample matrix included?	X			
Sample receipt temperature 2-6°C?	X			5° C
Signed COCs included?	X			
Date of sample collection included?	X			
Date of sample digestion included?	X			
Holding time to digestion met criteria? (Soils -30 days from collection to digestion.)	X			
Date of analysis included?	X			
Holding time to analysis met criteria? (Soils -168 hours from digestion to analysis; Aqueous - 24 hours from collection to analysis.)	X			
Method reference included?	X			
Laboratory Case Narrative included?	X			

Definitions: MDL - Method Detection Limit; %R - Percent Recovery; RL - Reporting Limit; RPD - Relative Percent Difference; RSD - Relative Standard Deviation :Corr - Correlation Coefficient.

ITEM	YES	NO	N/A	COMMENTS
Initial calibration documentation included in lab package?	X			
1) Blank plus 4 standards (7196A) or blank plus 3 standards (7199)	X			
2) Correlation coefficient of =0.995 (7196A) or =0.999 (7199)	X			
3) Calibrate daily or each time instrument is set up.	X			
Calibration Check Standard (CCS) for 7196A and Quality Control Sample (QCS) for 7199 Included in Lab Package?	X			
1) %R criteria met? (90 - 110%)	X			
2) Correct frequency of one per every 10 samples	X			
3) CCS and QCS from independent source and at mid- level of calibration curve	X			
Calibration Blanks	X			
1) Analyzed prior to initial calibration standards and after each CCS/QCS?	X			
2) Absolute value should not exceed MDL.	X			
Method Blank, Field Blanks and/or Equipment Blanks Included in Lab Package?	X			
1) Method blank analyzed with each preparation batch?	X			
2) Absolute value should not exceed MDL.	X			
Eh and pH Data	X			
1) Eh and pH data was included and plotted for all samples?	X			
Soluble Matrix Spike Data Included in Lab Package?	X			JC26495-4, -4R
1) Soluble Matrix %R criteria met? (75-125%R).		X		See nonconformance tables.
2) Was the spike concentration 40 mg/Kg or twice the sample concentration?		X		Spiked at 95 and 90.2 mg/kg. No impact on data.
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	X			
Insoluble Matrix Spike Data Included in Lab Package?	X			
1) Insoluble Matrix %R criteria met? (75-125%R).		X		See nonconformance tables.
2) Was the spike concentration around 400 to 800 mg/Kg?		X		Spiked at 2290 and 1740 mg/kg. No impact on data.
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	X			

Post Digestion Spike	X			
1) Post Digestion Spike %R criteria met? (85-115%R).		X		See nonconformance tables. No qualifications made.
2) Was the spike concentration 40 mg/Kg or twice the sample concentration?	X			
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	X			
Sample Duplicate Data Included in Lab Package?	X			JC26495-4,-4R
1.) RPD criteria met? (RPD < 20%) if both results are $\geq 4x$ RL or control limit of \pm RL if both results are <4xRL.		X		See nonconformance tables.
2) Was a sample duplicate analyzed at the frequency of 1 per batch or 20 samples?	X			
Was a Laboratory Control Sample (LCS) Included in Lab Package?	X			
1) %R criteria met? (80-120%R).	X			
2) Was an LCS analyzed at the frequency of 1/batch or 20 samples?	X			
Were any Field Duplicate samples submitted with this SDG?		X		
1) RPD criteria met? (RPD < 20%) if both results are $\geq 4x$ RL or control limit of \pm RL if both results are <4xRL.			X	
Were all sample quantitation and reporting requirements met?	X			
1) Were all solid samples reported with percent solids > 50%?		X		See nonconformance tables.
2) Were any samples analyzed or reported with dilutions?	X			Samples diluted up to 4x. Not all results were reported. Sample JC26495-2R and -8R diluted 4X. Results reported.
Miscellaneous Items	X			
1) For soils by 7196A, was the pH within a range of 7.0-8.0?	X			
2) For soils by 7199, was the pH within a range of 9.0-9.5?	X			
3) For aqueous by 7196A, was the pH with a range of 1.5-2.5?	X			
4) For soils (3060A), was the digestion temperature 90-95C for at least 60 minutes?	X			
5) For 7199, was each sample injected twice and was the RPD ≤ 20 ?	X			

Matrix Spikes

Sample ID	Lab ID	Analyte	Matrix Spike	% Recovery	Lower Limit	Upper Limit	PDS %	PDS Limits %
NFS-PDI-W12B-9.5-10.0	JC26495-4R	CHROMIUM (HEXAVALENT)	Soluble	2.9	75	125	90.4	85-115
NFS-PDI-W12B-9.5-10.0	JC26495-4R	CHROMIUM (HEXAVALENT)	Insoluble	50.9	75	125		
NFS-PDI-W12B-9.5-10.0	JC26495-4	CHROMIUM (HEXAVALENT)	Soluble	12.3	75	125	21.68, pH adjusted 34.11	85-115
NFS-PDI-W12B-9.5-10.0	JC26495-4	CHROMIUM (HEXAVALENT)	Insoluble	9.9	75	125		

Lab Duplicates

Sample ID	Lab ID	Analyte	Sample Result	Qual	Duplicate Result	Qual	QL	Units	RPD	Action
NFS-PDI-W12B-9.5-10.0	JC26495-4	CHROMIUM (HEXAVALENT)	3.7		2.6		0.93	mg/kg	34.9	SR<4xRL, Abs Diff >RL, Estimate (J)
NFS-PDI-W12B-9.5-10.0	JC26495-4R	CHROMIUM (HEXAVALENT)	1.0	U	3.2	J	3.7	mg/kg	NC	SR<4xRL, Abs Diff <RL, Accept

NC – Not calculable

Percent Solids

Sample ID	Percent Solids (%)	Status
NFS-PDI-W12B-10.0-10.5	47.4	<50%
NFS-PDI-W12B-9.0-9.5	66.4	ok @50%
NFS-PDI-W12B-9.5-10.0	42.8	<50%
NFS-PDI-X12B-8.0-8.5	64.3	ok @50%
NFS-PDI-X12B-8.5-9.0	63.4	ok @50%
NFS-PDI-X12B-9.0-9.5	59.2	ok @50%
NFS-PDI-X12B-9.5-10.0	78.4	ok @50%

7199 Replicate RPDs

Sample ID	Rep 1 (ppm)	Rep 2 (ppm)	RPD%	RPD Criteria ≤20
JC26495-2R	0.137	0.135	1.5%	OK
JC26495-3R	0.023	0.024	4.3%	OK
JC26495-4R	0.021	0.024	13.3%	OK
JC26495-5R	0.019	0.018	5.4%	OK
JC26495-6R	0	0	0.0%	OK
JC26495-7R	0.02	0.021	4.9%	OK
JC26495-8R	0.034	0.034	0.0%	OK

SDG#: JC26495/ Method 7196

Batch: GN51639

Cr+6 ICAL 9/7/16

Soil

(p. 50 of data pkg)

x - concentration	y - response
0	0
0.01	0.009
0.05	0.04
0.1	0.083
0.3	0.242
0.5	0.398
0.8	0.648
1	0.818

(p. 50 of data pkg)

AECOM Calculated Offset	-0.0009	OK	Reported Offset	-0.0009
AECOM Slope	0.8134	OK	Reported Slope	0.8134
AECOM Calculated r	0.99992	OK	Reported r	0.99992

LCS calculation

GP99898-B1 P. 29,50

Background Absorbance	0
Total absorbance	0.686
Total absorbance - background	0.686
Instrument Concentration	0.844
Sample weight (mg/kg)	0.0025
Final Volume (L)	0.1
Dilution Factor	1

AECOM Calculated LCS Result (mg/Kg)	33.8	OK	Reported Result (mg/Kg)	33.8
-------------------------------------	------	----	-------------------------	------

%R = Found/True*100

GP99898-B1 P. 29,50

True Value (mg/kg)	40
--------------------	----

AECOM Calculated %R	84.4	OK , rounding	Reported %R	84.5
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MS calculation

GP99898-S2 P. 31,32,50 JC26495-4

Background reading	0.043
Total absorbance	0.433
Total absorbance - background	0.39
Instrument Concentration	0.4805
Sample weight (mg/kg)	0.00243
Final Volume (L)	0.1
Percent solids	0.428
Dilution Factor	5

AECOM Calculated MS Result (mg/Kg)	231.0	OK	Reported Result (mg/Kg)	231.0
------------------------------------	-------	----	-------------------------	-------

%R = Found/True*100

GP99898-S2 P. 31,32,50 JC26495-4

True Value (mg/kg)	2290
Native concentration (mg/Kg)	3.7

AECOM %R	9.9	OK	Reported %R	9.9
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Percent Solids

JC26495-4 P. 32 NFS-PDI-W12B-9.5-10.0

Empty dish weight=	18.35
Wet weight=	24.87
Dry weight=	21.14

AECOM %solids =	42.8	OK	Reported %solids=	42.8
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Reporting Limit	JC26495-4	P. 12,32,50	NFS-PDI-W12B-9.5-10.0
Low Standard	0.01		
Initial weight (mg/kg)	0.00242		
Final volume (L)	0.1		
Percent solids	0.428		
Dilution Factor	1		
Reporting Limit	0.97	OK, rounding	Reported RL (mg/Kg)= 0.93

Sample Calculations	JC26495-4	P. 12,32,50	NFS-PDI-W12B-9.5-10.0
Background reading	0.07		
Total absorbance	0.1		
Total absorbance - background	0.03		
Instrument Response	0.038		
Sample weight (mg/kg)	0.00242		
Final Volume (L)	0.1		
Percent solids	0.428		
Dilution Factor	1		
AECOM Calculated Result (mg/Kg)	3.7	OK	Reported Result (mg/Kg) 3.7

SDG: JC26495R/ Method 7199

Batch GN52036

Cr+6 ICAL 9/14/16
Soil
(p. 77 of data package)

x - concentration	y - response (area) mAU*min	
0.00	0	STDA
0.005	0.0539	STDB
0.05	0.4150	STDC
0.1	0.8552	STDD
0.5	4.2049	STDE

(p. 77 of
data
package)

AECOM Calculated Offset	0.0074	OK	Reported Offset	0.0074
AECOM Slope	8.3959	OK	Reported Slope	8.3959
AECOM Calculated r	1.0000	OK	Reported r	1.0000

LCS calculation

GP114-B1

P. 27,83

Highest replicate response (AREA,
mAU*min) 2.000
Instrument Concentration (ug/L) 0.237
Sample weight 0.0025
Percent solids 1
Dilution Factor 4

AECOM Calculated LCS Result (mg/Kg)	38.0	OK	Reported Result (mg/Kg)	38.0
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%R = Found/True*100

GP114-B1

P. 27,83

True Value (mg/kg) 40

AECOM Calculated %R	94.9	OK, rounding	Reported %R	95.0
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MS calculation

GP114-S2

P. 29,36,65,117

JC26495-4R

Highest replicate response (mAU*min) 2.069
Instrument Concentration (ug/L) 0.2455
Sample weight 0.00259
Percent solids 0.428
Dilution Factor 40

AECOM Calculated MS Result (mg/Kg)	886.0	OK	Reported Result (mg/Kg)	886.0
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%R = Found/True*100

GP114-S2

P. 29,36,65,117

JC26495-4R

True Value (mg/kg) 1740
Native concentration (mg/Kg) 0

%R	50.9	OK	Reported %R	50.9
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Percent Solids

JC26495-4R

P. 36

**NFS-PDI-W12B-9.5-
10.0**

Empty dish weight= 18.35
Wet weight= 24.87
Dry weight= 21.14

AECOM %solids =	42.8	OK	Reported %solids=	42.8
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Reporting limit	JC26495-4R	P. 10,36,65,90	NFS-PDI-W12B-9.5-10.0
Low Standard	0.01		
Initial weight (g)	0.00253		
Final volume (L)	0.1		
Percent solids	0.428		
Dilution Factor	4		
Reporting Limit	3.7	OK	Reported RL (mg/Kg)= 3.7

Sample Calculations	JC26495-4R	P. 10,36,65,90	NFS-PDI-W12B-9.5-10.0
Background reading from highest response	0.00001		
Instrument Response highest response	0.024		
Total response for replicate 1	0.02399		
Instrument Response (mg/L)	0.002		
Sample weight (mg)	0.00253		
Final Volume (L)	0.1		
Percent solids	0.428		
Dilution Factor	4		
AECOM Calculated Result (mg/Kg)	0.73	OK, <MDL, ND	Reported Result (mg/Kg) 1.0 U

Data Validation Report

Project:	PPG - Forrest PDI	
Laboratory:	SGS/Accutest, Dayton, NJ	
Laboratory Job No.:	JC26590 and JC26590R	
Analysis/Method:	Hexavalent Chromium SW846 3060A/7196A	
Validation Level:	Full	
Site Location/Address:	70 Carteret Ave, Jersey City, NJ	
AECOM Project No:	60314351.GA.DE.PDI.FOR	
Prepared by:	Sharon McKechnie/AECOM	Completed on: 10/05/2016
Reviewed by:	Mary Kozik/AECOM	File Name: JC26590_R 2016_10_05_DVReport-F

Introduction

The data were reviewed in accordance with the FSP-QAPP and the following NJDEP validation Standard Operating Procedure (SOP):

- NJDEP Office of Data Quality SOP 5.A.10, Rev 3 (September 2009), SOP for Analytical Data Validation of Hexavalent Chromium - for USEPA SW-846 Method 3060A, USEPA SW-846 Method 7196A.

The results of quality control data analyzed with site samples were used to assess the overall reliability of the data. The following qualifiers were used to identify data quality issues:

- U: Indicates the analyte was not detected in the sample above the sample reporting limit.
- J: Indicates the result was an estimated value; the associated numerical value was an approximate concentration of the analyte in the sample.
- UJ: Indicates the analyte was not detected above the reporting limit and the reporting limit was approximate.
- UB: The analyte concentration is less than or equal to three (3) times the concentration in the associated method/prep blank. The presence of the analyte in the sample is negated (UB) due to laboratory contamination.
- JB: The analyte concentration is greater than three (3) times, but less than or equal to ten (10) times the concentration in the associated method/prep blank. The presence of that analyte in the sample is considered "real". The concentration is quantitatively qualified (JB) due to method blank contamination.
- R: The sample result was rejected due to serious deficiencies; the presence or absence of the analyte could not be confirmed.
- RA: The sample result was rejected but is still considered usable.

Sample Information

The samples listed below were collected by AECOM on August 26, 2016 as part of the PPG- Forrest PDI sampling at 70 Carteret Ave, Jersey City, New Jersey. Only the samples and parameter listed below were validated.

Field ID	Laboratory ID	Matrix	Fraction
NFS-FB20160826 (Equipment Blank)	JC26590-1	Aqueous	Hexavalent Chromium
NFS-PDI-W13B-0.2-0.7	JC26590-2	Soil	Hexavalent Chromium
NFS-PDI-W13B-1.0-1.5	JC26590-3	Soil	Hexavalent Chromium
NFS-PDI-W13B-11.0-11.5	JC26590-4	Soil	Hexavalent Chromium
NFS-PDI-W13B-11.5-12.0	JC26590-5	Soil	Hexavalent Chromium
NFS-PDI-W13B-12.0-12.5	JC26590-6	Soil	Hexavalent Chromium
NFS-PDI-W13B-12.5-13.0	JC26590-7	Soil	Hexavalent Chromium
NFS-PDI-W13B-3.0-3.5	JC26590-8	Soil	Hexavalent Chromium
NFS-PDI-W13B-5.0-5.5	JC26590-9	Soil	Hexavalent Chromium
NFS-PDI-W13B-7.0-7.5	JC26590-10	Soil	Hexavalent Chromium
NFS-PDI-W13B-9.0-9.5	JC26590-11	Soil	Hexavalent Chromium
NFS-PDI-Y13B-1.0-1.5	JC26590-12	Soil	Hexavalent Chromium
NFS-PDI-Y13B-1.0-1.5X (Field Duplicate of NFS-PDI-Y13B-1.0-1.5)	JC26590-13	Soil	Hexavalent Chromium
NFS-PDI-Y13B-10.0-10.5	JC26590-14	Soil	Hexavalent Chromium
NFS-PDI-Y13B-12.0-12.5	JC26590-15,15R	Soil	Hexavalent Chromium
NFS-PDI-Y13B-14.0-14.5	JC26590-16,16R	Soil	Hexavalent Chromium
NFS-PDI-Y13B-16.0-16.5	JC26590-17,17R	Soil	Hexavalent Chromium
NFS-PDI-Y13B-18.0-18.5	JC26590-18,18R	Soil	Hexavalent Chromium
NFS-PDI-Y13B-2.0-2.5	JC26590-19,19R	Soil	Hexavalent Chromium
NFS-PDI-Y13B-20.0-20.5	JC26590-20,20R	Soil	Hexavalent Chromium
NFS-PDI-Y13B-4.0-4.5	JC26590-21,21R	Soil	Hexavalent Chromium
NFS-PDI-Y13B-6.0-6.5	JC26590-22,22R	Soil	Hexavalent Chromium
NFS-PDI-Y13B-8.0-8.5	JC26590-23,23R	Soil	Hexavalent Chromium
NFS-PDI-Y13B-8.5-9.0	JC26590-24,24R	Soil	Hexavalent Chromium

The samples were collected following the procedures detailed in the Work Order for Garfield Avenue Remedial Action (GARA) at 70 Carteret Ave, Jersey City, NJ and the Field Sampling Plan/Quality Assurance Project Plan for Non-Residential and Residential Chromium Sites Hudson County, New Jersey (December 2011).

General Comments

The data package was complete. Quality control (QC) issues identified during validation are discussed below. Refer to the Target Analyte Summary Hit List(s) in Attachment A for a listing of all detected results, qualified results, and associated qualifications, where applicable. The nonconformances for each section discussed below are presented in Attachment B.

MS Results

The MS samples associated with the data in this SDG were as follows:

- NFS-PDI-Y13B-10.0-10.5 (JC26590-14) analytical prep batch GP99953; and
- NFS-PDI-Y13B-18.0-18.5 (JC26590-18,18R) initial analysis/reanalysis analytical prep batches GP99954/GP103.

MS samples are first associated with field samples using matrix similarities, then by analytical preparation batch when no matrix match is possible. The following table summarizes each of the MS samples, the field samples associated with each, and differentiates between those associated by matrix, and those associated by batch.

Spiked Sample	Samples Associated by Matrix	Samples Associated by Batch
NFS-PDI-Y13B-10.0-10.5 (JC26590-14)	JC26590-11, JC26590-14, JC26590-24	JC26590-4, JC26590-5, JC26590-6, JC26590-7, JC26590-8, JC26590-12, JC26590-13
NFS-PDI-Y13B-18.0-18.5 (JC26590-18)	JC26590-2,JC26590-3,JC26590-9, JC26590-10, JC26590-16, JC26590-18, JC26590-20	JC26590-15, JC26590-17, JC26590-19, JC26590-21, JC26590-22, JC26590-23

NFS-PDI-Y13B-10.0-10.5 (JC26590-14)

The soluble and insoluble MS recoveries were 79.2% and 87.8%, respectively. Both MS recoveries met the quality control (QC) criteria of 75-125%R. The post digestion spike (PDS) recovery was 86.9%, which was within the QC criteria of 85-115%. No qualification based on MS recovery was applied since the the MS recoveries met MS QC requirements.

NFS-PDI-Y13B-18.0-18.5 (JC26590-18,18R)

The soluble and insoluble MS recoveries from the initial batch were 62.2% and 98.9%. The soluble MS recovery did not meet QC criteria of 75-125%R. The PDS recovery was 99.8% which met the PDS criteria of 85-115%.

Based on the low MS recovery, the samples were reanalyzed using Method 7196. The soluble and insoluble MS results from the reanalysis were 79.5% and 138.9%, respectively. The insoluble MS recovery did not meet QC criteria of 75-125%R. The PDS recovery was 108.7% which met the PDS criteria of 85-115%.

Since the MS recoveries failed to meet QC criteria, additional parameters were analyzed to determine if possible matrix interferences could be the cause for the poor matrix spike recoveries. All the samples were tested for pH and oxidation-reduction potential (ORP), and plotted on an Eh/pH phase diagram. From this chart, the source sample for the matrix spike analysis of sample NFS-PDI-Y13B-18.0-18.5 was plotted below the phase change line, indicating reducing potential within the sample matrix, incapable of supporting hexavalent chromium. Ferrous iron, sulfide screen, and total organic carbon (TOC) were performed on this matrix spike source sample to confirm the oxidizing/reducing potential within the sample matrix. The sulfide screen was reported as nondetect, indicating no reducing agents within the sample matrix; however, the ferrous iron (0.55%) and the TOC results (111 mg/Kg) were positive, indicating potential reducing agents within the sample matrix.

Since the MS recoveries from both the initial and reanalysis did not meet the MS QC requirements, but at least one MS recovery was greater than 50% and less than 125%, the reported hexavalent chromium results for the associated samples were qualified as estimated (J/UJ) due to the nonconforming MS

recoveries. The highest detected hexavalent chromium result or the nondetect hexavalent chromium result with the lowest RL was reported for each soil sample.

Laboratory Duplicate

In the laboratory duplicate analysis of sample NFS-PDI-Y13B-18.0-18.5 (JC26590-18R) in reanalysis batch GP103/GN52067, the original sample result was nondetect and the duplicate result was detected at greater than 4X the RL. Therefore, all hexavalent chromium results reported from the reanalysis batch were qualified as estimated (J/UJ) based on duplicate precision.

Refer to the tables in Attachment B for a listing of laboratory duplicate results and associated samples and qualifications as applicable.

Percent Solids

The moisture content for sample NFS-PDI-W13B-12.0-12.5 (JC26590-6) exceeded the acceptable limit of 50%; therefore, the result was qualified (J) as estimated.

Sample Results

Reported results (flagged B by the laboratory) that were less than the reporting limit (RL), but greater than or equal to the method detection limit (MDL) are approximate values and have been qualified as estimated (J).

Data Quality and Usability

In general, these data appear to be valid and may be used for decision-making purposes. No data were rejected. Qualified and detected results are presented in Attachments A and B.

The hexavalent chromium soil results associated with MS sample NFS-PDI-Y13B-10.0-10.5 (JC26590-14) were accepted without qualification on the basis of MS recovery. Refer to the MS association table in the text above for associated samples.

The remaining hexavalent chromium soil results associated with MS sample NFS-PDI-Y13B-18.0-18.5 (JC26590-18) were estimated with an undefined bias due to both high and low MS recoveries, and since the MS sample matrix appears to be reducing based on the Eh-pH plot and the presence of TOC and ferrous iron. Refer to the MS association table in the text above for associated samples.

Due to poor laboratory duplicate precision, all hexavalent chromium results reported from reanalysis batch GP103/GN52067 were estimated with an undefined bias. Refer to the tables in Attachment B for a listing of laboratory duplicate results and associated qualification actions as applicable.

Sample results reported between the MDL and RL, and qualified due to high percent moisture content are estimated values with an unknown directional bias.

ATTACHMENTS

Attachment A: Target Analyte Summary Hitlist(s)

Attachment B: Data Validation Report Form

Attachment A

Target Analyte Summary Hitlist(s)

Soil Target Analyte Summary Hit List (Hexavalent Chromium)

Site Name PPG-Forest PDI
Sampling Date August 26, 2016
Lab Name/ID SGS/Accutest, Dayton, NJ
SDG No JC26590 and JC26590R
Sample Matrix Soil
Trip Blank ID NA
Field Blank ID NFS-FB20160826

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
NFS-PDI-W13B-0.2-0.7	JC26590-2	CHROMIUM (HEXAVALENT)	U	0.59	0.59	0.41	Qualify	1
NFS-PDI-W13B-1.0-1.5	JC26590-3	CHROMIUM (HEXAVALENT)	U	2.7	2.7	0.43	Qualify	1
NFS-PDI-W13B-11.0-11.5	JC26590-4	CHROMIUM (HEXAVALENT)	U	0.44B	0.44	0.58	Qualify	4
NFS-PDI-W13B-11.5-12.0	JC26590-5	CHROMIUM (HEXAVALENT)	U	0.95	0.95	0.50		
NFS-PDI-W13B-12.0-12.5	JC26590-6	CHROMIUM (HEXAVALENT)	U	U	U	0.80	Qualify	3
NFS-PDI-W13B-3.0-3.5	JC26590-8	CHROMIUM (HEXAVALENT)	U	32.9	32.9	0.48		
NFS-PDI-W13B-5.0-5.5	JC26590-9	CHROMIUM (HEXAVALENT)	U	16.5	16.5	0.47	Qualify	1
NFS-PDI-W13B-7.0-7.5	JC26590-10	CHROMIUM (HEXAVALENT)	U	U	U	0.51	Qualify	1
NFS-PDI-Y13B-12.0-12.5	JC26590-15R	CHROMIUM (HEXAVALENT)	U	0.95	0.95	0.51	Qualify	1,2
NFS-PDI-Y13B-14.0-14.5	JC26590-16	CHROMIUM (HEXAVALENT)	U	1.4	1.4	0.46	Qualify	1
NFS-PDI-Y13B-16.0-16.5	JC26590-17R	CHROMIUM (HEXAVALENT)	U	0.59	0.59	0.47	Qualify	1,2
NFS-PDI-Y13B-18.0-18.5	JC26590-18R	CHROMIUM (HEXAVALENT)	U	1.1	1.1	0.45	Qualify	1,2
NFS-PDI-Y13B-2.0-2.5	JC26590-19	CHROMIUM (HEXAVALENT)	U	12.2	12.2	0.58	Qualify	1
NFS-PDI-Y13B-20.0-20.5	JC26590-20	CHROMIUM (HEXAVALENT)	U	1.4	1.4	0.44	Qualify	1
NFS-PDI-Y13B-4.0-4.5	JC26590-21	CHROMIUM (HEXAVALENT)	U	U	U	0.50	Qualify	1
NFS-PDI-Y13B-6.0-6.5	JC26590-22	CHROMIUM (HEXAVALENT)	U	1.9	1.9	0.58	Qualify	1
NFS-PDI-Y13B-8.0-8.5	JC26590-23	CHROMIUM (HEXAVALENT)	U	1.7	1.7	0.64	Qualify	1

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

NJDEP Laboratory Footnote

1. The sample result was estimated because the matrix spike recoveries were outside QC criteria, but greater than 50%.
2. The reported value was estimated because the lab duplicate duplicate precision criteria were not met.
3. The reported values were estimated because the sample moisture content was greater than 50 percent.
4. The reported result was greater than the MDL but less than the RL and therefore was estimated.

Attachment B

Data Validation Report Form

Client Name: PPG Industries	Project Number: 60314351.GA.DE.PDI.FOR
Site Location: PPG-Forest PDI, Jersey City, NJ	Project Manager: Aimee Ruitter
Laboratory: SGS/Accutest, Dayton, NJ	Type of Validation: Full
Laboratory Job No: JC26590 and JC26590R	Date Checked: 10/05/2016
Validator: Sharon McKechnie	Peer: Mary Kozik

ITEM	YES	NO	N/A	COMMENTS
Sample results included?	X			
Reporting Limits met project requirements?	X			
Field I.D. included?	X			
Laboratory I.D. included?	X			
Did data package sample IDs match sample IDs on COC?	X			
Did electronic data deliverable (EDD) sample IDs match COC sample IDs?	X			
Did data package sample IDs match electronic data deliverable (EDD) sample IDs?	X			
Sample matrix included?	X			
Sample receipt temperature 2-6°C?	X			
Signed COCs included?	X			
Date of sample collection included?	X			
Date of sample digestion included?	X			
Holding time to digestion met criteria? (Soils -30 days from collection to digestion.)	X			
Date of analysis included?	X			
Holding time to analysis met criteria? (Soils -168 hours from digestion to analysis; Aqueous - 24 hours from collection to analysis.)	X			
Method reference included?	X			
Laboratory Case Narrative included?	X			

Definitions: MDL - Method Detection Limit; %R - Percent Recovery; RL - Reporting Limit; RPD - Relative Percent Difference; RSD - Relative Standard Deviation ;Corr - Correlation Coefficient.

ITEM	YES	NO	N/A	COMMENTS
Initial calibration documentation included in lab package?	X			
1) Blank plus 4 standards (7196A) or blank plus 3 standards (7199)	X			
2) Correlation coefficient of >0.995 (7196A) or >0.999 (7199)	X			
3) Calibrate daily or each time instrument is set up.	X			
Calibration Check Standard (CCS) for 7196A and Quality Control Sample (QCS) for 7199 Included in Lab Package?	X			
1) %R criteria met? (90 - 110%)	X			
2) Correct frequency of one per every 10 samples	X			
3) CCS and QCS from independent source and at mid- level of calibration curve	X			
Calibration Blanks	X			
1) Analyzed prior to initial calibration standards and after each CCS/QCS?	X			
2) Absolute value should not exceed MDL.	X			
Method Blank, Field Blanks and/or Equipment Blanks Included in Lab Package?	X			
1) Method blank analyzed with each preparation batch?	X			
2) Absolute value should not exceed MDL.	X			
Eh and pH Data	X			
1) Eh and pH data was included and plotted for all samples?	X			
Soluble Matrix Spike Data Included in Lab Package?	X			JC26590-14, JC26590-18/18R
1) Soluble Matrix %R criteria met? (75-125%R).	X*	X		* JC26590-14 met criteria. See Table
2) Was the spike concentration 40 mg/Kg or twice the sample concentration?		X		JC26590-14 Initial spiked at 47.7 mg/kg. The data was not affected. JC26590-18/18R Initial and rerun spiked at 43.5 mg/kg, the data was not affected.
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	X			

ITEM	YES	NO	N/A	COMMENTS
Insoluble Matrix Spike Data Included in Lab Package?	X			JC26590-14, JC26590-18/18R
1) Insoluble Matrix %R criteria met? (75-125%R).	X*	X		* JC26590-14 met criteria. See Table
2) Was the spike concentration around 400 to 800 mg/Kg?		X		JC26590-14 Initial spiked at 1220 mg/kg. The data was not affected. JC26590-18/18R Initial and rerun spiked at 1140 mg/kg and 1420 mg/kg, respectively. The data was not affected.
Post Digestion Spike	X			
1) Post Digestion Spike %R criteria met? (85-115%R).	X			See Table
2) Was the spike concentration 40 mg/Kg or twice the sample concentration?	X			
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	X			
Sample Duplicate Data Included in Lab Package?	X			JC26590-14, JC26590-18/18R
1) RPD criteria met? (RPD ≤ 20%) if both results are ≥4x RL or control limit of ± RL if both results are <4xRL.	X	X**		JC26590-14 and JC26590-18 OK **JC26590-18R estimate
2) Was a sample duplicate analyzed at the frequency of 1 per batch or 20 samples?	X			
Was a Laboratory Control Sample (LCS) Included in Lab Package?	X			
1) %R criteria met? (80-120%R).	X			
2) Was an LCS analyzed at the frequency of 1/batch or 20 samples?	X			
Were any Field Duplicate samples submitted with this SDG?	X			JC26590-12 and JC26590-13
1) RPD criteria met? (RPD < 20%) if both results are ≥4x RL or control limit of ± RL if both results are <4xRL.	X			Both nondetect.
Were all sample quantitation and reporting requirements met?	X			
1) Were all solid samples reported with percent solids > 50%?		X		See Table
2) Were any samples analyzed or reported with dilutions?		X		No dilutions

ITEM	YES	NO	N/A	COMMENTS
Miscellaneous Items	X			
1) For soils by 7196A, was the pH within a range of 7.0-8.0?	X			
2) For soils by 7199, was the pH within a range of 9.0-9.5?			X	
3) For aqueous by 7196A, was the pH with a range of 1.5-2.5?	X			
4) For soils (3060A), was the digestion temperature 90-95C for at least 60 minutes?	X			
5) For 7199, was each sample injected twice and was the RPD ≤20?			X	
Chromium result greater than corresponding hexavalent chromium result where applicable?			NA	No associated Cr results

Matrix Spikes

Sample ID	Lab ID	Analyte	Matrix Spike	% Recovery	Lower Limit	Upper Limit	PDS%/pH ADJ PDS	PDS Limits
NFS-PDI-Y13B-10.0-10.5	JC26590-14	CHROMIUM (HEXAVALENT)	Soluble	79.2	75	125	86.9	85-115
NFS-PDI-Y13B-10.0-10.5	JC26590-14	CHROMIUM (HEXAVALENT)	Insoluble	87.8	75	125		
NFS-PDI-Y13B-18.0-18.5	JC26590-18	CHROMIUM (HEXAVALENT)	Soluble	62.2	75	125	99.8	85-115
NFS-PDI-Y13B-18.0-18.5	JC26590-18	CHROMIUM (HEXAVALENT)	Insoluble	98.9	75	125		
NFS-PDI-Y13B-18.0-18.5	JC26590-18R	CHROMIUM (HEXAVALENT)	Soluble	79.5	75	125	108.7	85-115
NFS-PDI-Y13B-18.0-18.5	JC26590-18R	CHROMIUM (HEXAVALENT)	Insoluble	138.9	75	125		

Lab Duplicates

Sample ID	Lab ID	Analyte	Sample Result	Duplicate Result	QL	Units	RPD (%)	Action/Associated Prep Batch
NFS-PDI-Y13B-10.0-10.5	JC26590-14	CHROMIUM (HEXAVALENT)	ND	0.59	0.48	mg/kg	NC	Sample result ND, detected <4XRL, Accept.
NFS-PDI-Y13B-18.0-18.5	JC26590-18	CHROMIUM (HEXAVALENT)	0.66	0.53	0.45	mg/kg	21.8	Both <4XRL, Abs Diff 0.13mg/kg<RL; Accept
NFS-PDI-Y13B-18.0-18.5	JC26590-18R	CHROMIUM (HEXAVALENT)	1.1	0.40	0.45	mg/kg	93.3	Both <4XRL, Abs Diff 0.70mg/kg>RL; Estimate (J/UJ) all reported from rerun in associated batch (samples 15R-24R).

NC – Not calculable

ND – Not detected

Percent Solids

Sample ID	Percent Solids (%)	Status
NFS-PDI-W13B-12.0-12.5	49.8	<50%

SDG#: JC26590/ Method 7196

Batch: GN51651

Cr+6 ICAL 9/6/16

Soil

(p. 88 of data pkg)

Samples 2-14

x - concentration	y - response
0	0
0.01	0.008
0.05	0.042
0.1	0.081
0.3	0.249
0.5	0.416
0.8	0.672
1	0.828

(p. 89 of data pkg)

AECOM Calculated Offset	-0.0003	OK	Reported Offset	-0.0003
AECOM Slope	0.8328	OK	Reported Slope	0.8328
AECOM Calculated r	0.99996	OK	Reported r	0.99996

LCS calculation

GP99953-B1 P.60,89

Background Absorbance	0
Total absorbance	0.774
Total absorbance - background	0.774
Instrument Concentration	0.930
Sample weight (mg/kg)	0.0025
Final Volume (L)	0.1
Dilution Factor	1

AECOM Calculated LCS Result (mg/Kg)	37.2	OK	Reported Result (mg/Kg)	37.2
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%R = Found/True*100

GP99953-B1 P.60,89

True Value (mg/kg)	40
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AECOM Calculated %R	93.0	OK	Reported %R	93.0
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MS calculation

GP99953-S1 P.62,89 JC26590-14

Background reading	0.035
Total absorbance	0.694
Total absorbance - background	0.659
Instrument Concentration	0.7917
Sample weight (mg/kg)	0.00254
Final Volume (L)	0.1
Percent solids	0.828
Dilution Factor	1

AECOM Calculated MS Result (mg/Kg)	37.6	OK, rounding	Reported Result (mg/Kg)	37.8
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%R = Found/True*100

GP99953-S1 P.62,89 JC26590-14

True Value (mg/kg)	47.7
Native concentration (mg/Kg)	0

AECOM %R	78.9	OK, rounding	Reported %R	79.2
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Percent Solids

JC26590-14 P.128 NFS-PDI-Y13B-10.0-10.5

Empty dish weight=	18.15
Wet weight=	24.67
Dry weight=	23.55

AECOM %solids =	82.8	OK	reported %solids=	82.8
-----------------	------	----	-------------------	------

Reporting Limit	JC26590-14	P.26,89	NFS-PDI-Y13B-10.0-10.5
Low Standard	0.01		
Initial weight (mg/kg)	0.0025		
Final volume (L)	0.1		
Percent solids	0.828		
Dilution Factor	1		
Reporting Limit	0.48	OK	Reported RL (mg/Kg)= 0.48

Sample Calculations

	JC26590-14	P.26,89	NFS-PDI-Y13B-10.0-10.5
Background reading	0.036		
Total absorbance	0.041		
Total absorbance - background	0.005		
Instrument Response	0.006		
Sample weight (mg/kg)	0.00254		
Final Volume (L)	0.1		
Percent solids	0.828		
Dilution Factor	1		
AECOM Calculated Result (mg/Kg)	0.30	OK, reported as nondetect	Reported Result (mg/Kg) 0.34U

SDG#: JC26590/ Method 7196

Batch: GN52067

Cr+6 ICAL 9/15/16

Soil

(p. 68 of data pkg)

Samples 15-24

x - concentration	y - response
0	0
0.01	0.008
0.05	0.041
0.1	0.082
0.3	0.25
0.5	0.427
0.8	0.657
1	0.840

(p. 68 of data pkg)

AECOM Calculated Offset	-0.0001	OK	Reported Offset	-0.0001
AECOM Slope	0.8355	OK	Reported Slope	0.8355
AECOM Calculated r	0.99984	OK	Reported r	0.99984

LCS calculation

GP103-B1 P.36,68

Background Absorbance	0.001		
Total absorbance	0.728		
Total absorbance - background	0.727		
Instrument Concentration	0.870		
Sample weight (mg/kg)	0.0025		
Final Volume (L)	0.1		
Dilution Factor	1		
AECOM Calculated LCS Result (mg/Kg)	34.8	OK	Reported Result (mg/Kg) 34.8

%R = Found/True*100

GP103-B1 P.36,68

True Value (mg/kg)	40		
AECOM Calculated %R	87.0	OK	Reported %R 87.0

MS calculation	GP103-S1	P.38,68	JC26590-18R
Background reading	0.002		
Total absorbance	0.688		
Total absorbance - background	0.686		
Instrument Concentration	0.8212		
Sample weight (mg/kg)	0.0026		
Final Volume (L)	0.1		
Percent solids	0.884		
Dilution Factor	1		
AECOM Calculated MS Result (mg/Kg)	35.7	OK	Reported Result (mg/Kg) 35.7

%R = Found/True*100	GP103-S1	P.38,68	JC26590-18R
True Value (mg/kg)	43.5		
Native concentration (mg/Kg)	1.1		
AECOM%R	79.6	OK, rounding	Reported %R 79.5

Percent Solids	JC26590-18R	P.135	NFS-PDI-Y13B-18.0-18.5
Empty dish weight=	20.85		
Wet weight=	28.80		
Dry weight=	27.88		
AECOM%solids =	88.4	OK	reported %solids= 88.4

Reporting Limit	JC26590-18R	P.12,68	NFS-PDI-Y13B-18.0-18.5
Low Standard	0.01		
Initial weight (mg/kg)	0.0025		
Final volume (L)	0.1		
Percent solids	0.884		
Dilution Factor	1		
Reporting Limit	0.45	OK	Reported RL (mg/Kg)= 0.45

Sample Calculations	JC26590-18R	P.12,68	NFS-PDI-Y13B-18.0-18.5
Background reading	0		
Total absorbance	0.02		
Total absorbance - background	0.02		
Instrument Response	0.024		
Sample weight (mg/kg)	0.00242		
Final Volume (L)	0.1		
Percent solids	0.884		
Dilution Factor	1		
AECOM Calculated Result (mg/Kg)	1.1	OK	Reported Result (mg/Kg) 1.1

Data Validation Report

Project: PPG - North Forest Street PDI

Laboratory: SGS/Accutest, Dayton, NJ

Laboratory Job No.: JC26685 and JC26685R

Analysis/Method: Hexavalent Chromium SW846 3060A/7196

Validation Level: Full

Site Location/Address: 70 Carteret Avenue

AECOM Project No: 60314351.GA.DE.PDI.NFS

Prepared by: Charlene Livingston Flint /AECOM Completed on: 09/29/2016

Reviewed by: Mary Kozik /AECOM File Name: JC26685_R_2016-09-29_DVReport-F

Introduction

The data were reviewed in accordance with the FSP-QAPP and the following NJDEP validation Standard Operating Procedure (SOP):

- NJDEP Office of Data Quality SOP 5.A.10, Rev 3 (September 2009), SOP for Analytical Data Validation of Hexavalent Chromium - for USEPA SW-846 Method 3060A, USEPA SW-846 Method 7196A and USEPA SW-846 Method 7199;

The results of quality control data analyzed with site samples were used to assess the overall reliability of the data. The following qualifiers were used to identify data quality issues:

- U: Indicates the analyte was not detected in the sample above the sample reporting limit.
- J: Indicates the result was an estimated value; the associated numerical value was an approximate concentration of the analyte in the sample.
- UJ: Indicates the analyte was not detected above the reporting limit and the reporting limit was approximate.
- UB: The analyte concentration is less than or equal to three (3) times the concentration in the associated method/prep blank. The presence of the analyte in the sample is negated (UB) due to laboratory contamination.
- JB: The analyte concentration is greater than three (3) times, but less than or equal to ten (10) times the concentration in the associated method/prep blank. The presence of that analyte in the sample is considered "real". The concentration is quantitatively qualified (JB) due to method blank contamination.
- R: The sample result was rejected due to serious deficiencies; the presence or absence of the analyte could not be confirmed.
- RA: The sample result was rejected but is still considered usable.

Sample Information

The samples listed below were collected by AECOM on August 29, 2016 as part of the PPG - North Forest Street PDI sampling at 70 Carteret Avenue, Jersey City, New Jersey. Only the samples and parameters listed below were validated.

Field ID	Laboratory ID	Matrix	Fraction
NFS-FB20160829 (Equipment Blank)	JC26685-1	Aqueous	Hexavalent Chromium
NFS-PDI-V13B-0.0-0.5	JC26685-2, 2R	Soil	Hexavalent Chromium
NFS-PDI-V13B-10.0-10.5	JC26685-3, 3R	Soil	Hexavalent Chromium
NFS-PDI-V13B-12.0-12.5	JC26685-4, 4R	Soil	Hexavalent Chromium
NFS-PDI-V13B-14.0-14.5	JC26685-5, 5R	Soil	Hexavalent Chromium
NFS-PDI-V13B-15.0-15.5	JC26685-6, 6R	Soil	Hexavalent Chromium
NFS-PDI-V13B-15.5-16.0	JC26685-7, 7R	Soil	Hexavalent Chromium
NFS-PDI-V13B-2.0-2.5	JC26685-8, 8R	Soil	Hexavalent Chromium
NFS-PDI-V13B-4.0-4.5	JC26685-9, 9R	Soil	Hexavalent Chromium
NFS-PDI-V13B-6.0-6.5	JC26685-10, 10R	Soil	Hexavalent Chromium
NFS-PDI-V13B-6.0-6.5X (Field Duplicate of NFS-PDI-V13B-6.0-6.5)	JC26685-11, 11R	Soil	Hexavalent Chromium
NFS-PDI-V13B-8.0-8.5	JC26685-12, 12R	Soil	Hexavalent Chromium
NFS-PDI-W14B-14.0-14.5	JC26685-13, 13R	Soil	Hexavalent Chromium
NFS-PDI-W14B-14.0-14.5X (Field Duplicate of NFS-PDI-W14B-14.0-14.5)	JC26685-14, 14R	Soil	Hexavalent Chromium
NFS-PDI-W14B-15.5-16.0	JC26685-15, 15R	Soil	Hexavalent Chromium
NFS-PDI-W14B-16.0-16.5	JC26685-16, 16R	Soil	Hexavalent Chromium
NFS-PDI-X13B-14.5-15.0	JC26685-17, 17R	Soil	Hexavalent Chromium
NFS-PDI-X13B-15.0-15.5	JC26685-18, 18R	Soil	Hexavalent Chromium
NFS-PDI-X13B-4.5-5.0	JC26685-19, 19R	Soil	Hexavalent Chromium
NFS-PDI-X13B-5.0-5.5	JC26685-20, 20R	Soil	Hexavalent Chromium
NFS-PDI-X14B-0.2-0.7	JC26685-21, 21R	Soil	Hexavalent Chromium
NFS-PDI-X14B-10.0-10.5	JC26685-22, 22R	Soil	Hexavalent Chromium
NFS-PDI-X14B-12.0-12.5	JC26685-23, 23R	Soil	Hexavalent Chromium
NFS-PDI-X14B-14.0-14.5	JC26685-24, 24R	Soil	Hexavalent Chromium
NFS-PDI-X14B-15.0-15.5	JC26685-25, 25R	Soil	Hexavalent Chromium
NFS-PDI-X14B-15.5-16.0	JC26685-26, 26R	Soil	Hexavalent Chromium
NFS-PDI-X14B-16.0-16.5	JC26685-27, 27R	Soil	Hexavalent Chromium
NFS-PDI-X14B-18.0-18.5	JC26685-28, 28R	Soil	Hexavalent Chromium
NFS-PDI-X14B-2.0-2.5	JC26685-29, 29R	Soil	Hexavalent Chromium
NFS-PDI-X14B-20.0-20.5	JC26685-30, 30R	Soil	Hexavalent Chromium
NFS-PDI-X14B-4.0-4.5	JC26685-31, 31R	Soil	Hexavalent Chromium
NFS-PDI-X14B-6.0-6.5	JC26685-32, 32R	Soil	Hexavalent Chromium
NFS-PDI-X14B-8.0-8.5	JC26685-33, 33R	Soil	Hexavalent Chromium

The samples were collected following the procedures detailed in the Work Order for Garfield Avenue Remedial Action (GARA) at 70 Carteret Avenue and the Field Sampling Plan/Quality Assurance Project Plan for Non-Residential and Residential Chromium Sites Hudson County, New Jersey (December 2011).

General Comments

The data package was complete. Quality control (QC) issues identified during validation are discussed below. Refer to the Target Analyte Summary Hit(s) in Attachment A for a listing of all detected results, qualified results, and associated qualifications, where applicable. The nonconformances for each section discussed below are presented in Attachment B.

MS Results

Three matrix spike (MS) samples, NFS-PDI-V13B-12.0-12.5 (JC26685-4), NFS-PDI-X13B-15.0-15.5 (JC26685-18) and NFS-PDI-X13B-4.5-5.0 (JC26685-19) were analyzed with the samples in this SDG and were used for supporting data quality recommendations. MS samples are associated with field samples using matrix similarities as the primary criteria, then by analytical preparation batch when no matrix match is possible. The following table summarizes each of the MS samples and field samples associated with each, differentiating between those associated by matrix, and those associated by batch.

Spiked Sample	Samples Associated by Matrix	Samples Associated by Batch
NFS-PDI-V13B-12.0-12.5 (JC26685-4)	NFS-PDI-V13B-0.0-0.5 (JC26685-2) NFS-PDI-V13B-2.0-2.5 (JC26685-8) NFS-PDI-V13B-4.0-4.5 (JC26685-9) NFS-PDI-V13B-6.0-6.5 (JC26685-10) NFS-PDI-V13B-6.0-6.5X (JC26685-11) NFS-PDI-X14B-0.2-0.7 (JC26685-21) NFS-PDI-X14B-10.0-10.5 (JC26685-22) NFS-PDI-X14B-12.0-12.5 (JC26685-23) NFS-PDI-X14B-14.0-14.5 (JC26685-24) NFS-PDI-X14B-15.0-15.5 (JC26685-25) NFS-PDI-X14B-2.0-2.5 (JC26685-29) NFS-PDI-X14B-4.0-4.5 (JC26685-31) NFS-PDI-X14B-6.0-6.5 (JC26685-32) NFS-PDI-X14B-8.0-8.5 (JC26685-33)	NFS-PDI-V13B-10.0-10.5 (JC26685-3) NFS-PDI-V13B-15.5-16.0 (JC26685-7) NFS-PDI-V13B-8.0-8.5 (JC26685-12) NFS-PDI-W14B-16.0-16.5 (JC26685-16)
NFS-PDI-X13B-15.0-15.5 (JC26685-18)	NFS-PDI-X13B-14.5-15.0 (JC26685-17) NFS-PDI-X13B-5.0-5.5 (JC26685-20) NFS-PDI-X14B-20.0-20.5 (JC26685-30)	NFS-PDI-X14B-15.5-16.0 (JC26685-26) NFS-PDI-X14B-16.0-16.5 (JC26685-27) NFS-PDI-X14B-18.0-18.5 (JC26685-28)
NFS-PDI-X13B-4.5-5.0 (JC26685-19)	NFS-PDI-V13B-14.0-14.5 (JC26685-5) NFS-PDI-V13B-15.0-15.5 (JC26685-6) NFS-PDI-W14B-14.0-14.5 (JC26685-13) NFS-PDI-W14B-14.0-14.5X (JC26685-14) NFS-PDI-W14B-15.5-16.0 (JC26685-15)	

MS sample NFS-PDI-V13B-12.0-12.5 (JC26685-4)

For the MS on sample NFS-PDI-V13B-12.0-12.5, associated with samples as noted above, the soluble and insoluble MS recoveries from the initial batch were 22.2% and 79.5%, respectively. The soluble MS recovery did not meet quality control (QC) criteria of 75-125%R. The post digestion spike (PDS)

recovery was 62.14% and after pH adjustment was 74.30%, which did not meet the PDS criteria of 85-115%.

Based on the soluble MS recovery less than 75%R, the MS and associated samples were reanalyzed using Method 7196. The soluble and insoluble matrix spike recoveries from the re-analysis were -0.7% and 78.5%. The soluble MS recovery did not meet QC criteria of 75-125%R. The post spike result for the re-analysis batch was recovered at 42.6% and after pH adjustment was 35.4%, which did not meet the PDS criteria of 85-115%.

Since the soluble MS recoveries were outside the acceptable QC limit of 75-125%, additional parameters were analyzed to determine if possible matrix interferences could be the cause for the poor matrix spike recoveries. All the soil samples were tested for pH and oxidation reduction potential (ORP) and plotted on an Eh/pH phase diagram chart. From this chart, the source sample for the matrix spike analysis was plotted below the phase change line, indicating reducing potential within the sample matrix, incapable of supporting hexavalent chromium. Analyses for ferrous iron, sulfide screen, and total organic carbon (TOC) were performed on the MS source sample to confirm the oxidizing/reducing potential within the sample matrix. The sulfide screen was reported as nondetect, indicating no reducing agents within the sample matrix; however, the ferrous iron (1.5 %) and the TOC results (4410 mg/Kg) were positive, indicating potential reducing agents within the sample matrix.

Since the soluble MS recoveries from both the initial and reanalysis did not meet the MS QC requirements, but at least one MS recovery was greater than 50%, the highest detected hexavalent chromium result or the nondetect hexavalent chromium result with the lowest reporting limit (RL) was reported for each associated soil sample. The reported hexavalent chromium results in the associated soil samples were qualified as estimated (J/UJ) due to MS and PDS recoveries outside of control limits.

MS sample NFS-PDI-X13B-15.0-15.5 (JC26685-18)

Sample NFS-PDI-X13B-15.0-15.5, associated with samples as noted above, was selected for the soil matrix spike analysis and used for supporting data quality recommendations. The soluble and insoluble MS recoveries from the initial batch were 22.4% and 106.1%, respectively. The soluble MS recovery did not meet QC criteria of 75-125%R. The PDS recovery was 75.55% and after pH adjustment was 89.20%, which met the PDS criteria of 85-115%.

Based on the soluble MS recovery less than 75%R, the MS and associated samples were reanalyzed using Method 7196. The soluble and insoluble matrix spike recoveries from the re-analysis were 46.6% and 93.9%, respectively. The soluble MS recovery did not meet the QC criteria of 75-125%R. The post spike result for the re-analysis batch was recovered at 72.63% and after pH adjustment was 61.28%, which did not meet the PDS criteria of 85-115%.

Since the soluble MS recoveries were outside the acceptable QC limit of 75-125%, additional parameters were analyzed to determine if possible matrix interferences could be the cause for the poor matrix spike recoveries. All the soil samples were tested for pH and ORP and plotted on an Eh/pH phase diagram chart. From this chart, the source sample for the matrix spike analysis was plotted below the phase change line, indicating reducing potential within the sample matrix, incapable of supporting hexavalent chromium. Analyses for ferrous iron, sulfide screen, and TOC were performed on the MS source sample to confirm the oxidizing/reducing potential within the sample matrix. The sulfide screen was reported as nondetect, indicating no reducing agents within the sample matrix; however, the ferrous iron (0.92 %) and the TOC results (3670 mg/Kg) were positive, indicating potential reducing agents within the sample matrix.

Since the soluble MS recoveries from both the initial and reanalysis did not meet the MS QC requirements, but at least one MS recovery was greater than 50%, the highest detected hexavalent chromium result or the nondetect hexavalent chromium result with the lowest RL was reported for each

soil sample. The reported hexavalent chromium results in the associated soil samples were qualified as estimated (J/UJ) due to the soluble MS recoveries.

No further qualification was taken based on the low reanalysis PDS recovery since the initial PDS %R was acceptable.

MS sample NFS-PDI-X13B-4.5-5.0 (JC26685-19)

Sample NFS-PDI-X13B-4.5-5.0, associated with samples as noted above, was selected for the soil matrix spike analysis and used for supporting data quality recommendations. The soluble and insoluble matrix spike (MS) recoveries from the initial batch were 8.7% and 84.9%, respectively. The soluble MS recovery did not meet quality control (QC) criteria of 75-125%R. The post digestion spike (PDS) recovery was 44.52% and after pH adjustment was 36.15%, which met the PDS criteria of 85-115%.

Based on the soluble MS recovery less than 75%R, the MS and associated samples were reanalyzed using Method 7196. The soluble and insoluble matrix spike recoveries from the re-analysis were - 0.8% and 63.7%, respectively. The soluble and insoluble MS recoveries did not meet the QC criteria of 75-125%R. The post spike result for the re-analysis batch was recovered at 86.7%, which met the PDS criteria of 85-115%.

Since the soluble and/or insoluble MS recoveries were outside the acceptable QC limit of 75-125%, additional parameters were analyzed to determine if possible matrix interferences could be the cause for the poor matrix spike recoveries. All the soil samples were tested for pH and ORP and plotted on an Eh/pH phase diagram chart. From this chart, the source sample for the matrix spike analysis was plotted below the phase change line, indicating reducing potential within the sample matrix, incapable of supporting hexavalent chromium. Analyses for ferrous iron, sulfide screen, and TOC were performed on the MS source sample to confirm the oxidizing/reducing potential within the sample matrix. The sulfide screen was reported as nondetect, indicating no reducing agents within the sample matrix; however, the ferrous iron (1.3%) and the TOC results (12,400 mg/Kg) were positive, indicating potential reducing agents within the sample matrix.

Since the MS recoveries from both the initial and reanalysis did not meet the MS QC requirements, but at least one MS recovery was greater than 50%, the highest detected hexavalent chromium result or the nondetect hexavalent chromium result with the lowest RL was reported for each soil sample. The reported hexavalent chromium results in the associated soil samples in this SDG were qualified as estimated (J/UJ) due to the poor MS recoveries.

No further qualification was taken based on the low initial PDS recovery since the reanalysis PDS %R was acceptable.

Laboratory Duplicate Precision

There were three sets of laboratory duplicates associated with this SDG that were selected by the laboratory to demonstrate laboratory precision capabilities.

Sample NFS-PDI-V13B-12.0-12.5 (JC26685-4), associated with samples JC26685-2 through JC26685-16 was selected by the laboratory to demonstrate laboratory precision capabilities.

Both the sample and duplicate results were less than 4 times the reporting limit (RL). The absolute difference was greater than the absolute difference criteria of less than or equal to the RL in the reanalysis; therefore, all hexavalent chromium soil results reported from the reanalysis, from samples as noted above, were qualified as estimated (J/UJ).

All QC criteria was met for sample NFS-PDI-X13B-15.0-15.5 (JC26685-18), associated with samples JC26685-17 and JC26685-21 through JC26685-33. No qualifications were made.

All QC criteria was met for sample NFS-PDI-X13B-4.5-5.0 (JC26685-19), associated with sample JC26685-20. No qualifications were made.

Field Duplicate Results

Two field duplicate pairs, NFS-PDI-V13B-6.0-6.5 (JC26685-10R), NFS-PDI-V13B-6.0-6.5X (JC26685-11R) and NFS-PDI-W14B-14.0-14.5 (JC26685-13R), NFS-PDI-W14B-14.0-14.5X (JC26685-14), are associated with the samples in this SDG and were used for supporting data quality recommendations. Field duplicate samples are associated with field samples using matrix similarities as the primary criteria, then by analytical preparation batch when no matrix match is possible. The following table summarizes each of the field duplicate samples and field samples associated with each, differentiating between those associated by matrix, and those associated by batch.

Field Duplicate Sample	Samples Associated for Matrix	Samples Associated by Batch
NFS-PDI-V13B-6.0-6.5 (JC26685-10R), NFS-PDI-V13B-6.0-6.5X (JC26685-11R)	NFS-PDI-V13B-0.0-0.5 (JC26685-2) NFS-PDI-V13B-12.0-12.5 (JC26685-4) NFS-PDI-V13B-2.0-2.5 (JC26685-8) NFS-PDI-V13B-4.0-4.5 (JC26685-9) NFS-PDI-X13B-4.5-5.0 (JC26685-19) NFS-PDI-X14B-0.2-0.7 (JC26685-21) NFS-PDI-X14B-10.0-10.5 (JC26685-22) NFS-PDI-X14B-12.0-12.5 (JC26685-23) NFS-PDI-X14B-14.0-14.5 (JC26685-24) NFS-PDI-X14B-15.0-15.5 (JC26685-25) NFS-PDI-X14B-2.0-2.5 (JC26685-29) NFS-PDI-X14B-4.0-4.5 (JC26685-31) NFS-PDI-X14B-6.0-6.5 (JC26685-32) NFS-PDI-X14B-8.0-8.5 (JC26685-33)	NFS-PDI-V13B-10.0-10.5 (JC26685-3) NFS-PDI-V13B-15.5-16.0 (JC26685-7) NFS-PDI-V13B-8.0-8.5 (JC26685-12) NFS-PDI-W14B-16.0-16.5 (JC26685-16)
NFS-PDI-W14B-14.0-14.5 (JC26685-13R), NFS-PDI-W14B-14.0-14.5X (JC26685-14)	NFS-PDI-V13B-14.0-14.5 (JC26685-5) NFS-PDI-V13B-15.0-15.5 (JC26685-6) NFS-PDI-W14B-14.0-14.5 (JC26685-13) NFS-PDI-W14B-14.0-14.5X (JC26685-14) NFS-PDI-W14B-15.5-16.0 (JC26685-15)	NFS-PDI-X13B-5.0-5.5 (JC26685-20)

The relative percent difference for the reported hexavalent chromium field duplicate results in the reported parent sample and field duplicate results for samples NFS-PDI-V13B-6.0-6.5 (JC26685-10R) and NFS-PDI-V13B-6.0-6.5X (JC26685-11R) and NFS-PDI-W14B-14.0-14.5 (JC26685-13R) and NFS-PDI-W14B-14.0-14.5X (JC26685-14) exceeded the QC acceptance RPD; therefore, the reported hexavalent chromium results in the associated soil samples were qualified as estimated (J/UJ).

Samples not associated by matrix type or batch QC include NFS-PDI-X13B-14.5-15.0 (JC26685-17), NFS-PDI-X13B-15.0-15.5 (JC26685-18), NFS-PDI-X14B-15.5-16.0 (JC26685-26), NFS-PDI-X14B-16.0-16.5 (JC26685-27), NFS-PDI-X14B-18.0-18.5 (JC26685-28) and NFS-PDI-X14B-20.0-20.5 (JC26685-30). No qualifications were made on these samples.

Percent Solids

The moisture content for NFS-PDI-V13B-15.5-16.0 (JC26685-7) and NFS-PDI-X14B-16.0-16.5 (JC26685-27) exceeded the acceptable limit of 50%; therefore, the results were qualified (J) as estimated.

Sample Results

Reported results (flagged B by the laboratory) that were less than the reporting limit (RL), but greater than or equal to the method detection limit (MDL) are approximate values and have been qualified as estimated (J).

Sample NFS-PDI-V13B-15.5-16.0 (JC26685-7,-7R) had results that significantly differed between the initial analysis and reanalysis, such that one result exceeded the project action limit of 20 mg/kg. The highest detected hexavalent chromium result between the initial analysis and reanalysis was reported for each sample in this SDG.

Data Quality and Usability

In general, these data appear to be valid and may be used for decision-making purposes. No data were rejected. Qualified results, if applicable, are presented in Attachments A and B.

The hexavalent chromium soil results in this SDG are usable as estimated values with the potential for low bias due to low soluble MS and or PDS recovery, and since the MS sample matrix appears to be reducing based on the Eh-pH plot and the presence of TOC and ferrous iron.

Sample results qualified due to poor laboratory duplicate precision and or field duplicate precision, are usable as estimated values with an unknown directional bias.

Sample NFS-PDI-V13B-15.5-16.0 (JC26685-7,-7R) had results that significantly differed between the initial analysis and reanalysis, such that one result exceeded the project action limit of 20 mg/kg. The highest detected hexavalent chromium result between the initial analysis and reanalysis was reported for each sample in this SDG.

Sample results reported between the MDL and RL, and/or qualified due to high percent moisture content are usable as estimated values with an unknown directional bias.

ATTACHMENTS

Attachment A: Target Analyte Summary Hitlist(s)

Attachment B: Data Validation Report Form

Attachment A

Target Analyte Summary Hitlist(s)

Soil Target Analyte Summary Hit List (Hexavalent Chromium)

Site Name PPG - North Forest Street PDI
Sampling Date August 29, 2016
Lab Name/ID SGS/Accutest, Dayton, NJ
SDG No JC26685 and JC26685R
Sample Matrix Soil
Trip Blank ID NA
Field Blank ID NFS-FB20160829

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
NFS-PDI-V13B-0.0-0.5	JC26685-2	CHROMIUM (HEXAVALENT)	U	0.76	0.76	0.42	Qualify	1,2,,4
NFS-PDI-V13B-10.0-10.5	JC26685-3	CHROMIUM (HEXAVALENT)	U	4.4	4.4	0.47	Qualify	1,2,4
NFS-PDI-V13B-12.0-12.5	JC26685-4R	CHROMIUM (HEXAVALENT)	U	0.35B	0.35	0.47	Qualify	1,2,3,4,6
NFS-PDI-V13B-14.0-14.5	JC26685-5	CHROMIUM (HEXAVALENT)	U	U	U	0.49	Qualify	1,4
NFS-PDI-V13B-15.0-15.5	JC26685-6	CHROMIUM (HEXAVALENT)	U	2.2	2.2	0.71	Qualify	1,4
NFS-PDI-V13B-15.5-16.0	JC26685-7	CHROMIUM (HEXAVALENT)	U	78.4	78.4	1.6	Qualify	1,2,4,5
NFS-PDI-V13B-2.0-2.5	JC26685-8	CHROMIUM (HEXAVALENT)	U	0.95	0.95	0.44	Qualify	1,2,4
NFS-PDI-V13B-4.0-4.5	JC26685-9R	CHROMIUM (HEXAVALENT)	U	5.8	5.8	0.44	Qualify	1,2,3,4
NFS-PDI-V13B-6.0-6.5	JC26685-10R	CHROMIUM (HEXAVALENT)	U	7.7	7.7	0.47	Qualify	1,2,3,4
NFS-PDI-V13B-6.0-6.5X	JC26685-11R	CHROMIUM (HEXAVALENT)	U	10.1	10.1	0.48	Qualify	1,2,3,4
NFS-PDI-V13B-8.0-8.5	JC26685-12R	CHROMIUM (HEXAVALENT)	U	11.6	11.6	0.56	Qualify	1,2,3,4
NFS-PDI-W14B-14.0-14.5	JC26685-13R	CHROMIUM (HEXAVALENT)	U	7.9	7.9	0.46	Qualify	1,3,4
NFS-PDI-W14B-14.0-14.5X	JC26685-14	CHROMIUM (HEXAVALENT)	U	4.1	4.1	0.47	Qualify	1,4
NFS-PDI-W14B-15.5-16.0	JC26685-15R	CHROMIUM (HEXAVALENT)	U	2.7	2.7	0.49	Qualify	1,3,4
NFS-PDI-W14B-16.0-16.5	JC26685-16R	CHROMIUM (HEXAVALENT)	U	0.56	0.56	0.52	Qualify	1,2,3,4
NFS-PDI-X13B-14.5-15.0	JC26685-17	CHROMIUM (HEXAVALENT)	U	1.4	1.4	0.45	Qualify	1
NFS-PDI-X13B-15.0-15.5	JC26685-18R	CHROMIUM (HEXAVALENT)	U	2.3	2.3	0.47	Qualify	1
NFS-PDI-X13B-4.5-5.0	JC26685-19R	CHROMIUM (HEXAVALENT)	U	0.43B	0.43	0.51	Qualify	1,4,6

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
NFS-PDI-X13B-5.0-5.5	JC26685-20R	CHROMIUM (HEXAVALENT)	U	1.1	1.1	0.49	Qualify	1,4
NFS-PDI-X14B-0.2-0.7	JC26685-21	CHROMIUM (HEXAVALENT)	U	3.2	3.2	0.45	Qualify	1,2,4
NFS-PDI-X14B-10.0-10.5	JC26685-22R	CHROMIUM (HEXAVALENT)	U	76.6	76.6	2.4	Qualify	1,2,4
NFS-PDI-X14B-12.0-12.5	JC26685-23	CHROMIUM (HEXAVALENT)	U	36.6	36.6	0.52	Qualify	1,2,4
NFS-PDI-X14B-14.0-14.5	JC26685-24R	CHROMIUM (HEXAVALENT)	U	2.6	2.6	0.52	Qualify	1,2,4
NFS-PDI-X14B-15.0-15.5	JC26685-25R	CHROMIUM (HEXAVALENT)	U	0.41B	0.41	0.47	Qualify	1,2,4,6
NFS-PDI-X14B-15.5-16.0	JC26685-26	CHROMIUM (HEXAVALENT)	U	1.5	1.5	0.56	Qualify	1
NFS-PDI-X14B-16.0-16.5	JC26685-27	CHROMIUM (HEXAVALENT)	U	4.3	4.3	0.86	Qualify	1,5
NFS-PDI-X14B-18.0-18.5	JC26685-28	CHROMIUM (HEXAVALENT)	U	1.3	1.3	0.48	Qualify	1
NFS-PDI-X14B-2.0-2.5	JC26685-29R	CHROMIUM (HEXAVALENT)	U	2.5	2.5	0.45	Qualify	1,2,4
NFS-PDI-X14B-20.0-20.5	JC26685-30	CHROMIUM (HEXAVALENT)	U	0.44B	0.44	0.46	Qualify	1,6
NFS-PDI-X14B-4.0-4.5	JC26685-31	CHROMIUM (HEXAVALENT)	U	10.6	10.6	0.46	Qualify	1,2,4
NFS-PDI-X14B-6.0-6.5	JC26685-32R	CHROMIUM (HEXAVALENT)	U	25.8	25.8	0.49	Qualify	1,2,4
NFS-PDI-X14B-8.0-8.5	JC26685-33	CHROMIUM (HEXAVALENT)	U	27.5	27.5	0.50	Qualify	1,2,4

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

NJDEP Laboratory Footnote

1. The reported value was qualified because the soluble and/or insoluble matrix recoveries were less than 75%, but greater than 50%.
2. The reported value was qualified because the PDS recovery was less than 85 percent.
3. In the laboratory duplicate sample analysis, Hexavalent Chromium fell outside the control limits of +/- RL for sample results < 4xRL. Therefore, the result was qualified.
4. In the Field Duplicate Sample Analysis, Hexavalent Chromium fell outside the control limits of $\leq 20\%$ for sample results > 4xRL or + RL for sample results < 4xRL. Therefore, the result was qualified.

5. The reported values were estimated because the sample moisture content was greater than 50 percent.
6. The reported result was greater than the MDL but less than the RL and therefore was estimated.

Attachment B

Data Validation Report Form

Client Name: PPG Industries	Project Number: 60314351.GA.DE.PDI.NFS
Site Location: PPG - North Forest Street PDI, Jersey City, NJ	Project Manager: Aimee Ruitter
Laboratory: SGS/Accutest, Dayton, NJ	Type of Validation: Full
Laboratory Job No: JC26685 and JC26685R	Date Checked: 09/29/2016
Validator: Charlene Livingston Flint	Peer: Mary Kozik

ITEM	YES	NO	N/A	COMMENTS
Sample results included?	X			
Reporting Limits met project requirements?	X			
Field I.D. included?	X			
Laboratory I.D. included?	X			
Did data package sample IDs match sample IDs on COC?	X			
Did electronic data deliverable (EDD) sample IDs match COC sample IDs?	X			
Did data package sample IDs match electronic data deliverable (EDD) sample IDs?	X			
Sample matrix included?	X			
Sample receipt temperature 2-6°C?	X			3.7°C
Signed COCs included?	X			
Date of sample collection included?	X			
Date of sample digestion included?	X			
Holding time to digestion met criteria? (Soils -30 days from collection to digestion.)	X			
Date of analysis included?	X			
Holding time to analysis met criteria? (Soils -168 hours from digestion to analysis; Aqueous - 24 hours from collection to analysis.)	X			
Method reference included?	X			
Laboratory Case Narrative included?	X			

Definitions: MDL - Method Detection Limit; %R - Percent Recovery; RL - Reporting Limit; RPD - Relative Percent Difference; RSD - Relative Standard Deviation ;Corr - Correlation Coefficient.

ITEM	YES	NO	N/A	COMMENTS
Initial calibration documentation included in lab package?	X			
1) Blank plus 4 standards (7196A) or blank plus 3 standards (7199)	X			
2) Correlation coefficient of =0.995 (7196A) or =0.999 (7199)	X			
3) Calibrate daily or each time instrument is set up.	X			
Calibration Check Standard (CCS) for 7196A and Quality Control Sample (QCS) for 7199 Included in Lab Package?	X			
1) %R criteria met? (90 - 110%)	X			
2) Correct frequency of one per every 10 samples	X			
3) CCS and QCS from independent source and at mid- level of calibration curve	X			
Calibration Blanks	X			
1) Analyzed prior to initial calibration standards and after each CCS/QCS?	X			
2) Absolute value should not exceed MDL.	X			
Method Blank, Field Blanks and/or Equipment Blanks Included in Lab Package?	X			
1) Method blank analyzed with each preparation batch?	X			
2) Absolute value should not exceed MDL.	X			
Eh and pH Data	X			
1) Eh and pH data was included and plotted for all samples?	X			
Soluble Matrix Spike Data Included in Lab Package?	X			3 sets. JC26685-4,-4R, -18, -18R and -19, -19R.
1) Soluble Matrix %R criteria met? (75-125%R).		X		See nonconformance tables.
2) Was the spike concentration 40 mg/Kg or twice the sample concentration?	X			Spiked at 45.9, 47.6, 46.9, 48.3, 51.7 and 50.9 mg/kg. No impact on data.
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	X			
Insoluble Matrix Spike Data Included in Lab Package?	X			
1) Insoluble Matrix %R criteria met? (75-125%R).		X		See nonconformance tables.
2) Was the spike concentration around 400 to 800 mg/Kg?		X		Spiked at 1020, 894, 1160, 924, 1040 and 1450 mg/kg. No impact on data.
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	X			

Post Digestion Spike	X			
1) Post Digestion Spike %R criteria met? (85-115%R).		X		See nonconformance tables. JC26685-4 did not meet QC criteria.
2) Was the spike concentration 40 mg/Kg or twice the sample concentration?	X			
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	X			
Sample Duplicate Data Included in Lab Package?	X			3 Sets. JC26685-4, -4R, -18, -18R and -19, -19R
1.) RPD criteria met? (RPD < 20%) if both results are $\geq 4x$ RL or control limit of \pm RL if both results are <4xRL.	X			See nonconformance tables.
2) Was a sample duplicate analyzed at the frequency of 1 per batch or 20 samples?	X			
Was a Laboratory Control Sample (LCS) Included in Lab Package?	X			
1) %R criteria met? (80-120%R).	X			
2) Was an LCS analyzed at the frequency of 1/batch or 20 samples?	X			
Were any Field Duplicate samples submitted with this SDG?	X			2 Sets. JC26685-10R & -11R and JC26685-13R & -14
1) RPD criteria met? (RPD < 20%) if both results are $\geq 4x$ RL or control limit of \pm RL if both results are <4xRL.		X		See nonconformance tables.
Were all sample quantitation and reporting requirements met?	X			
1) Were all solid samples reported with percent solids > 50%?		X		JC26685-7 and JC26685-27 <50%R.
2) Were any samples analyzed or reported with dilutions?	X			NFS-PDI-X14B-10.0-10.5 diluted 5x.
Miscellaneous Items	X			
1) For soils by 7196A, was the pH within a range of 7.0-8.0?	X			
2) For soils by 7199, was the pH within a range of 9.0-9.5?			X	
3) For aqueous by 7196A, was the pH with a range of 1.5-2.5?	X			
4) For soils (3060A), was the digestion temperature 90-95C for at least 60 minutes?	X			
5) For 7199, was each sample injected twice and was the RPD ≤ 20 ?			X	

Matrix Spikes

Sample ID	Lab ID	Analyte	Matrix Spike	% Recovery	Lower Limit	Upper Limit	PDS %	PDS Limits %
NFS-PDI-V13B-12.0-12.5	JC26685-4	CHROMIUM (HEXAVALENT)	Soluble	22.2	75	125	62.14, pH adjusted 74.30	85-115
NFS-PDI-V13B-12.0-12.5	JC26685-4	CHROMIUM (HEXAVALENT)	Insoluble	79.5	75	125		
NFS-PDI-V13B-12.0-12.5	JC26685-4R	CHROMIUM (HEXAVALENT)	Soluble	-0.7	75	125	42.6, pH adjusted 35.4	85-115
NFS-PDI-V13B-12.0-12.5	JC26685-4R	CHROMIUM (HEXAVALENT)	Insoluble	78.5	75	125		
NFS-PDI-X13B-15.0-15.5	JC26685-18R	CHROMIUM (HEXAVALENT)	Soluble	46.6	75	125	72.63, pH adjusted 61.28	85-115
NFS-PDI-X13B-15.0-15.5	JC26685-18R	CHROMIUM (HEXAVALENT)	Insoluble	93.9	75	125		
NFS-PDI-X13B-15.0-15.5	JC26685-18	CHROMIUM (HEXAVALENT)	Soluble	22.4	75	125	75.55, pH adjusted 89.20	85-115
NFS-PDI-X13B-15.0-15.5	JC26685-18	CHROMIUM (HEXAVALENT)	Insoluble	106.1	75	125		
NFS-PDI-X13B-4.5-5.0	JC26685-19	CHROMIUM (HEXAVALENT)	Soluble	8.7	75	125	44.52, pH adjusted 36.15	85-115
NFS-PDI-X13B-4.5-5.0	JC26685-19	CHROMIUM (HEXAVALENT)	Insoluble	84.9	75	125		
NFS-PDI-X13B-4.5-5.0	JC26685-19R	CHROMIUM (HEXAVALENT)	Soluble	-0.8	75	125	86.7	85-115
NFS-PDI-X13B-4.5-5.0	JC26685-19R	CHROMIUM (HEXAVALENT)	Insoluble	63.7	75	125		

Lab Duplicates

Sample ID	Lab ID	Analyte	Sample Result	Qual	Duplicate Result	Qual	QL	Units	RPD	Action
NFS-PDI-V13B-12.0-12.5	JC26685-4	CHROMIUM (HEXAVALENT)	0.33	U	1.2		0.33	mg/kg	NC	SR<4xRL, Abs Diff>RL, Estimate (J/UJ)

Sample ID	Lab ID	Analyte	Sample Result	Qual	Duplicate Result	Qual	QL	Units	RPD	Action
NFS-PDI-V13B-12.0-12.5	JC26685-4R	CHROMIUM (HEXAVALENT)	0.35	B	0.33	U	0.33	mg/kg	NC	SR<4xRL, Abs Diff <RL, Accept
NFS-PDI-X13B-15.0-15.5	JC26685-18	CHROMIUM (HEXAVALENT)	1.3		1.4		0.47	mg/kg	7.4	OK
NFS-PDI-X13B-15.0-15.5	JC26685-18R	CHROMIUM (HEXAVALENT)	2.3		2.1		0.47	mg/kg	9.1	OK
NFS-PDI-X13B-4.5-5.0	JC26685-19	CHROMIUM (HEXAVALENT)	0.51	U	0.65		0.51	mg/kg	NC	SR<4xRL, Abs Diff <RL, Accept
NFS-PDI-X13B-4.5-5.0	JC26685-19R	CHROMIUM (HEXAVALENT)	0.43	B	0.51	U	0.51	mg/kg	NC	SR<4xRL, Abs Diff <RL, Accept

Field Duplicates

Sample ID	Duplicate ID	Analyte	Sample Result	Qual	Duplicate Result	Qual	QL	Units	RPD	Action
NFS-PDI-W14B-14.0-14.5	NFS-PDI-W14B-14.0-14.5X	CHROMIUM (HEXAVALENT)	7.9		4.1		0.46	mg/kg	63.3	SR>4xRL, Abs Diff>RL, Estimate (J/UJ)
NFS-PDI-V13B-6.0-6.5	NFS-PDI-V13B-6.0-6.5X	CHROMIUM (HEXAVALENT)	7.7		10.1		0.47	mg/kg	27.0	SR>4xRL, Abs Diff>RL, Estimate (J/UJ)

Percent Solids

Sample ID	Percent Solids (%)	Status
NFS-PDI-V13B-0.0-0.5	95.2	ok @50%
NFS-PDI-V13B-10.0-10.5	84.6	ok @50%
NFS-PDI-V13B-12.0-12.5	84.8	ok @50%
NFS-PDI-V13B-14.0-14.5	82.1	ok @50%

Sample ID	Percent Solids (%)	Status
NFS-PDI-V13B-15.0-15.5	56.7	ok @50%
NFS-PDI-V13B-15.5-16.0	25.8	<50%
NFS-PDI-V13B-2.0-2.5	91.5	ok @50%
NFS-PDI-V13B-4.0-4.5	90.1	ok @50%
NFS-PDI-V13B-6.0-6.5	84.4	ok @50%
NFS-PDI-V13B-6.0-6.5X	83.6	ok @50%
NFS-PDI-V13B-8.0-8.5	70.9	ok @50%
NFS-PDI-W14B-14.0-14.5	86.5	ok @50%
NFS-PDI-W14B-14.0-14.5X	84.3	ok @50%
NFS-PDI-W14B-15.5-16.0	82.3	ok @50%
NFS-PDI-W14B-16.0-16.5	77.5	ok @50%
NFS-PDI-X13B-14.5-15.0	88.5	ok @50%
NFS-PDI-X13B-15.0-15.5	85.6	ok @50%
NFS-PDI-X13B-4.5-5.0	79.2	ok @50%
NFS-PDI-X13B-5.0-5.5	81.6	ok @50%
NFS-PDI-X14B-0.2-0.7	89.5	ok @50%
NFS-PDI-X14B-10.0-10.5	83	ok @50%
NFS-PDI-X14B-12.0-12.5	77.3	ok @50%
NFS-PDI-X14B-14.0-14.5	76.6	ok @50%
NFS-PDI-X14B-15.0-15.5	86	ok @50%
NFS-PDI-X14B-15.5-16.0	71.7	ok @50%
NFS-PDI-X14B-16.0-16.5	46.5	<50%
NFS-PDI-X14B-18.0-18.5	82.6	ok @50%
NFS-PDI-X14B-2.0-2.5	88.2	ok @50%
NFS-PDI-X14B-20.0-20.5	86.8	ok @50%
NFS-PDI-X14B-4.0-4.5	86.7	ok @50%
NFS-PDI-X14B-6.0-6.5	81.9	ok @50%
NFS-PDI-X14B-8.0-8.5	80.8	ok @50%

SDG#: JC26685/ Method 7196

Batch: GN51790

Cr+6 ICAL 9/9/16

Soil

(p. 131 of data pkg)

x - concentration	y - response
0	0
0.01	0.008
0.05	0.041
0.1	0.083
0.3	0.243
0.5	0.407
0.8	0.667
1	0.830

(p. 131 of data pkg)

AECOM Calculated Offset	-0.0017	OK	Reported Offset	-0.0017
AECOM Slope	0.8306	OK	Reported Slope	0.8306
AECOM Calculated r	0.99994	OK	Reported r	0.99994

LCS calculation

GP2-B1

P. 82,131

Background Absorbance	0
Total absorbance	0.722
Total absorbance - background	0.722
Instrument Concentration	0.871
Sample weight (mg/kg)	0.0025
Final Volume (L)	0.1
Dilution Factor	1

AECOM Calculated LCS Result (mg/Kg)	34.9	OK	Reported Result (mg/Kg)	34.9
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%R = Found/True*100

GP2-B1

P. 82,131

True Value (mg/kg)	40
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AECOM Calculated %R	87.1	OK, rounding	Reported %R	87.3
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MS calculation

GP2-S2

P. 84,85,131

JC26685-4

Background reading	0
Total absorbance	0.285
Total absorbance - background	0.285
Instrument Concentration	0.3452
Sample weight (mg/kg)	0.0025
Final Volume (L)	0.1
Percent solids	0.848
Dilution Factor	50

AECOM Calculated MS Result (mg/Kg)	814	OK	Reported Result (mg/Kg)	814
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%R = Found/True*100

GP2-S2

P. 84,85,131

JC26685-4

True Value (mg/kg)	1020
Native concentration (mg/Kg)	0

AECOM %R	79.8	OK, rounding	Reported %R	79.5
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Percent Solids	JC26685-4	P. 32	NFS-PDI-V13B-12.0-12.5
Empty dish weight=		23.58	
Wet weight=		30.11	
Dry weight=		29.12	
AECOM %solids =	84.8	OK	Reported %solids= 84.8

Reporting Limit	JC26685-4	P. 19,32,131	NFS-PDI-V13B-12.0-12.5
Low Standard		0.01	
Initial weight (mg/kg)		0.00255	
Final volume (L)		0.1	
Percent solids		0.848	
Dilution Factor		1	
Reporting Limit	0.46	OK, rounding	Reported RL (mg/Kg)= 0.47

Sample Calculations	JC26685-4	P. 19,32,131	NFS-PDI-V13B-12.0-12.5
Background reading		0.018	
Total absorbance		0.022	
Total absorbance - background		0.004	
Instrument Response		0.007	
Sample weight (mg/kg)		0.00255	
Final Volume (L)		0.1	
Percent solids		0.848	
Dilution Factor		1	
AECOM Calculated Result (mg/Kg)	0.32	OK, <MDL, ND	Reported Result (mg/Kg) 0.33 U

Associated w/ samples JC26685-2 through JC26685-16

SDG#: JC26685/ Method 7196

Batch: GN51802

Cr+6 ICAL 9/9/16

Soil

(p. 139 of data pkg)

x - concentration	y - response
0	0
0.01	0.008
0.05	0.041
0.1	0.083
0.3	0.243
0.5	0.407
0.8	0.667
1	0.830

(p. 139 of data pkg)

AECOM Calculated Offset	-0.0017	OK	Reported Offset	-0.0017
AECOM Slope	0.8306	OK	Reported Slope	0.8306
AECOM Calculated r	0.99994	OK	Reported r	0.99994

LCS calculation

GP7-B1

P. 82,139

Background Absorbance	0
Total absorbance	0.716
Total absorbance - background	0.716
Instrument Concentration	0.864
Sample weight (mg/kg)	0.0025
Final Volume (L)	0.1
Dilution Factor	1

AECOM Calculated LCS Result (mg/Kg)	34.6	OK	Reported Result (mg/Kg)	34.6
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%R = Found/True*100

GP7-B1

P. 82,139

True Value (mg/kg)	40
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AECOM Calculated %R	86.4	OK, rounding	Reported %R	86.5
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MS calculation

GP7-S2

P. 84,87,139

JC26685-18

Background reading	0
Total absorbance	0.427
Total absorbance - background	0.427
Instrument Concentration	0.5161
Sample weight (mg/kg)	0.00245
Final Volume (L)	0.1
Percent solids	0.856
Dilution Factor	50

AECOM Calculated MS Result (mg/Kg)	1230	OK	Reported Result (mg/Kg)	1230
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%R = Found/True*100

GP7-S2

P. 84,87,139

JC26685-18

True Value (mg/kg)	1160
Native concentration (mg/Kg)	1.3

AECOM %R	106.0	OK, rounding	Reported %R	106.1
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Percent Solids	JC26685-18	P. 87	NFS-PDI-X13B-15.0-15.5
Empty dish weight=	22.95		
Wet weight=	32.63		
Dry weight=	31.24		
AECOM %solids =	85.6	OK	Reported %solids= 85.6

Reporting Limit	JC26685-18	P. 87,139	NFS-PDI-X13B-15.0-15.5
Low Standard	0.01		
Initial weight (mg/kg)	0.00259		
Final volume (L)	0.1		
Percent solids	0.856		
Dilution Factor	1		
Reporting Limit	0.45	OK, rounding	Reported RL (mg/Kg)= 0.47

Sample Calculations	JC26685-18	P. 87,139	NFS-PDI-X13B-15.0-15.5
Background reading	0.002		
Total absorbance	0.025		
Total absorbance - background	0.023		
Instrument Response	0.030		
Sample weight (mg/kg)	0.00259		
Final Volume (L)	0.1		
Percent solids	0.856		
Dilution Factor	1		
AECOM Calculated Result (mg/Kg)	1.3	OK	Reported Result (mg/Kg) 1.3

Associated w/ samples JC26685-17, -18, -21 through 33

SDG#: JC26685/ Method 7196

Batch: GN51848

Cr+6 ICAL 9/10/16

Soil

(p. 147 of data pkg)

x - concentration	y - response
0	0
0.01	0.008
0.05	0.038
0.1	0.078
0.3	0.244
0.5	0.401
0.8	0.621
1	0.826

(p. 147 of data pkg)

AECOM Calculated Offset	-0.0021	OK	Reported Offset	-0.0021
AECOM Slope	0.8091	OK	Reported Slope	0.8091
AECOM Calculated r	0.99929	OK	Reported r	0.99929

LCS calculation

GP46-B1

P. 82,147

Background Absorbance	0
Total absorbance	0.788
Total absorbance - background	0.788
Instrument Concentration	0.977
Sample weight (mg/kg)	0.0025
Final Volume (L)	0.1
Dilution Factor	1

AECOM Calculated LCS Result (mg/Kg)	39.1	OK	Reported Result (mg/Kg)	39.1
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%R = Found/True*100

GP46-B1

P. 82,147

True Value (mg/kg)	40
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AECOM Calculated %R	97.7	OK, rounding	Reported %R	97.8
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MS calculation

GP46-S2

P. 84,87,147

JC26685-19

Background reading	0
Total absorbance	0.281
Total absorbance - background	0.281
Instrument Concentration	0.3499
Sample weight (mg/kg)	0.00251
Final Volume (L)	0.1
Percent solids	0.792
Dilution Factor	50

AECOM Calculated MS Result (mg/Kg)	880	OK	Reported Result (mg/Kg)	880
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%R = Found/True*100

GP46-S2

P. 84,87,147

JC26685-19

True Value (mg/kg)	1040
Native concentration (mg/Kg)	0

AECOM %R	84.6	OK, rounding	Reported %R	84.9
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Percent Solids	JC26685-19	P. 87	NFS-PDI-X13B-4.5-5.0
Empty dish weight=	22.34		
Wet weight=	29.11		
Dry weight=	27.7		
AECOM %solids =	79.2	OK	Reported %solids= 79.2

Reporting Limit	JC26685-19	P. 34,87,147	NFS-PDI-X13B-4.5-5.0
Low Standard	0.01		
Initial weight (mg/kg)	0.00255		
Final volume (L)	0.1		
Percent solids	0.792		
Dilution Factor	1		
Reporting Limit	0.50	OK, rounding	Reported RL (mg/Kg)= 0.51

Sample Calculations	JC26685-19	P. 34,87,147	NFS-PDI-X13B-4.5-5.0
Background reading	0.063		
Total absorbance	0.066		
Total absorbance - background	0.003		
Instrument Response	0.006		
Sample weight (mg/kg)	0.00255		
Final Volume (L)	0.1		
Percent solids	0.792		
Dilution Factor	1		
AECOM Calculated Result (mg/Kg)	0.31	OK, <MDL, ND	Reported Result (mg/Kg) 0.35 U

Associated w/ samples JC26685-19 and -20

SDG#: JC26685R/ Method 7196

Batch: GN52104

Cr+6 ICAL 9/16/16

Soil

(p. 133 of data pkg)

x - concentration	y - response
0	0
0.01	0.01
0.05	0.042
0.1	0.085
0.3	0.244
0.5	0.415
0.8	0.657
1	0.836

(p. 133 of data pkg)

AECOM Calculated Offset	-0.0001	OK	Reported Offset	-0.0001
AECOM Slope	0.8298	OK	Reported Slope	0.8298
AECOM Calculated r	0.99992	OK	Reported r	0.99992

LCS calculation

GP136-B1

P. 78,133

Background Absorbance	0.002
Total absorbance	0.748
Total absorbance - background	0.746
Instrument Concentration	0.899
Sample weight (mg/kg)	0.0025
Final Volume (L)	0.1
Dilution Factor	1

AECOM Calculated LCS Result (mg/Kg)	36.0	OK	Reported Result (mg/Kg)	36.0
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%R = Found/True*100

GP136-B1

P. 78,133

True Value (mg/kg)	40
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AECOM Calculated %R	89.9	OK, rounding	Reported %R	90.0
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MS calculation

GP136-S2

P. 80,133

JC26685-4R

Background reading	0.005
Total absorbance	0.246
Total absorbance - background	0.241
Instrument Concentration	0.2906
Sample weight (mg/kg)	0.00244
Final Volume (L)	0.1
Percent solids	0.848
Dilution Factor	50

AECOM Calculated MS Result (mg/Kg)	702	OK	Reported Result (mg/Kg)	702
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%R = Found/True*100

GP136-S2

P. 80,133

JC26685-4R

True Value (mg/kg)	894
Native concentration (mg/Kg)	0.35

AECOM %R	78.5	OK, rounding	Reported %R	78.5
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Percent Solids	JC26685-4R	P. 88	NFS-PDI-V13B-12.0-12.5
Empty dish weight=	23.58		
Wet weight=	30.11		
Dry weight=	29.12		
AECOM %solids =	84.8	OK	Reported %solids= 84.8

Reporting Limit	JC26685-4R	P. 16,88,133	NFS-PDI-V13B-12.0-12.5
Low Standard	0.01		
Initial weight (mg/kg)	0.00247		
Final volume (L)	0.1		
Percent solids	0.848		
Dilution Factor	1		
Reporting Limit	0.48	OK, rounding	Reported RL (mg/Kg)= 0.47

Sample Calculations	JC26685-4R	P. 16,88,133	NFS-PDI-V13B-12.0-12.5
Background reading	0.024		
Total absorbance	0.03		
Total absorbance - background	0.006		
Instrument Response	0.007		
Sample weight (mg/kg)	0.00247		
Final Volume (L)	0.1		
Percent solids	0.848		
Dilution Factor	1		
AECOM Calculated Result (mg/Kg)	0.35	OK	Reported Result (mg/Kg) 0.35 B

Associated w/samples JC26685-2R through -16R

SDG#: JC26685R/ Method 7196

Batch: GN52118

Cr+6 ICAL 9/16/16

Soil

(p. 141 of data pkg)

x - concentration	y - response
0	0
0.01	0.01
0.05	0.042
0.1	0.085
0.3	0.244
0.5	0.415
0.8	0.657
1	0.836

(p. 141 of data pkg)

AECOM Calculated Offset	-0.0001	OK	Reported Offset	-0.0001
AECOM Slope	0.8298	OK	Reported Slope	0.8298
AECOM Calculated r	0.99992	OK	Reported r	0.99992

LCS calculation

GP138-B1

P. 78,141

Background Absorbance	0
Total absorbance	0.735
Total absorbance - background	0.735
Instrument Concentration	0.886
Sample weight (mg/kg)	0.0025
Final Volume (L)	0.1
Dilution Factor	1

AECOM Calculated LCS Result (mg/Kg)	35.4	OK	Reported Result (mg/Kg)	35.4
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%R = Found/True*100

GP138-B1

P. 78,141

True Value (mg/kg)	40
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AECOM Calculated %R	88.6	OK, rounding	Reported %R	88.5
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MS calculation

GP138-S2

P. 80,90,141

JC26685-19R

Background reading	0
Total absorbance	0.308
Total absorbance - background	0.308
Instrument Concentration	0.3714
Sample weight (mg/kg)	0.00254
Final Volume (L)	0.1
Percent solids	0.792
Dilution Factor	50

AECOM Calculated MS Result (mg/Kg)	923	OK	Reported Result (mg/Kg)	923
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%R = Found/True*100

GP138-S2

P. 80,90,141

JC26685-19R

True Value (mg/kg)	1450
Native concentration (mg/Kg)	0.43

AECOM %R	63.6	OK, rounding	Reported %R	63.7
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Percent Solids	JC26685-19R	P. 90	NFS-PDI-X13B-4.5-5.0
Empty dish weight=	22.34		
Wet weight=	29.11		
Dry weight=	27.7		
AECOM %solids =	79.2	OK	Reported %solids= 79.2

Reporting Limit	JC26685-19R	P. 31,90,141	NFS-PDI-X13B-4.5-5.0
Low Standard	0.01		
Initial weight (mg/kg)	0.00255		
Final volume (L)	0.1		
Percent solids	0.792		
Dilution Factor	1		
Reporting Limit	0.50	OK, rounding	Reported RL (mg/Kg)= 0.51

Sample Calculations	JC26685-19R	P. 90,141	NFS-PDI-X13B-4.5-5.0
Background reading	0.032		
Total absorbance	0.039		
Total absorbance - background	0.007		
Instrument Response	0.009		
Sample weight (mg/kg)	0.00255		
Final Volume (L)	0.1		
Percent solids	0.792		
Dilution Factor	1		
AECOM Calculated Result (mg/Kg)	0.43	OK	Reported Result (mg/Kg) 0.43 B

Associated w/samples JC26685-19R and -20R

SDG#: JC26685R/ Method 7196

Batch: GN52216

Cr+6 ICAL 9/19/16

Soil

(p. 149 of data pkg)

x - concentration	y - response
0	0
0.01	0.008
0.05	0.041
0.1	0.081
0.3	0.236
0.5	0.4
0.8	0.628
1	0.803

(p. 149 of data pkg)

AECOM Calculated Offset	-0.0001	OK	Reported Offset	-0.0001
AECOM Slope	0.7963	OK	Reported Slope	0.7963
AECOM Calculated r	0.99989	OK	Reported r	0.99989

LCS calculation

GP137-B1 P. 78,149

Background Absorbance	0
Total absorbance	0.711
Total absorbance - background	0.711
Instrument Concentration	0.893
Sample weight (mg/kg)	0.0025
Final Volume (L)	0.1
Dilution Factor	1

AECOM Calculated LCS Result (mg/Kg)	35.7	OK	Reported Result (mg/Kg)	35.7
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%R = Found/True*100

GP137-B1 P. 78,149

True Value (mg/kg)	40
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AECOM Calculated %R	89.3	OK	Reported %R	89.3
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MS calculation

GP137-S2 P. 80,90,149 JC26685-18R

Background reading	0
Total absorbance	0.287
Total absorbance - background	0.287
Instrument Concentration	0.3605
Sample weight (mg/kg)	0.00242
Final Volume (L)	0.1
Percent solids	0.856
Dilution Factor	50

AECOM Calculated MS Result (mg/Kg)	870	OK	Reported Result (mg/Kg)	870
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%R = Found/True*100

GP137-S2 P. 80,90,149 JC26685-18R

True Value (mg/kg)	924
Native concentration (mg/Kg)	2.3

AECOM %R	93.9	OK	Reported %R	93.9
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Percent Solids

JC26685-18R P. 90 NFS-PDI-X13B-15.0-15.5

Empty dish weight=	22.95
Wet weight=	32.63
Dry weight=	31.24

AECOM %solids =	85.6	OK	Reported %solids=	85.6
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Reporting Limit	JC26685-18R	P. 30,90,149	NFS-PDI-X13B-15.0-15.5
Low Standard	0.01		
Initial weight (mg/kg)	0.00245		
Final volume (L)	0.1		
Percent solids	0.848		
Dilution Factor	1		
Reporting Limit	0.48	OK, rounding	Reported RL (mg/Kg)= 0.47

Sample Calculations	JC26685-18R	P. 30,90,149	NFS-PDI-X13B-15.0-15.5
Background reading	0.014		
Total absorbance	0.052		
Total absorbance - background	0.038		
Instrument Response	0.048		
Sample weight (mg/kg)	0.00245		
Final Volume (L)	0.1		
Percent solids	0.848		
Dilution Factor	1		
AECOM Calculated Result (mg/Kg)	2.3	OK	Reported Result (mg/Kg) 2.3

Associated w/samples JC26685-17R, -18R and 21R through -33R

Data Validation Report

Project: PPG - North Forrest Street PDI

Laboratory: SGS/Accutest, Dayton, NJ

Laboratory Job No.: JC27210 and JC27210R

Analysis/Method: Hexavalent Chromium SW846 3060A/7196A

Validation Level: Full

Site Location/Address: 70 Carteret Avenue

AECOM Project No: 60314351.GA.DE.PDI.NFS

Prepared by: Charlene Livingston Flint /AECOM Completed on: 10/03/2016

Reviewed by: Constance Lapite /AECOM File Name: JC27210_R_2016-10-03_DVReport-F

Introduction

The data were reviewed in accordance with the FSP-QAPP and the following NJDEP validation Standard Operating Procedure (SOP):

- NJDEP Office of Data Quality SOP 5.A.10, Rev 3 (September 2009), SOP for Analytical Data Validation of Hexavalent Chromium - for USEPA SW-846 Method 3060A, USEPA SW-846 Method 7196A and USEPA SW-846 Method 7199.

The results of quality control data analyzed with site samples were used to assess the overall reliability of the data. The following qualifiers were used to identify data quality issues:

- U: Indicates the analyte was not detected in the sample above the sample reporting limit.
- J: Indicates the result was an estimated value; the associated numerical value was an approximate concentration of the analyte in the sample.
- UJ: Indicates the analyte was not detected above the reporting limit and the reporting limit was approximate.
- UB: The analyte concentration is less than or equal to three (3) times the concentration in the associated method/prep blank. The presence of the analyte in the sample is negated (UB) due to laboratory contamination.
- JB: The analyte concentration is greater than three (3) times, but less than or equal to ten (10) times the concentration in the associated method/prep blank. The presence of that analyte in the sample is considered "real". The concentration is quantitatively qualified (JB) due to method blank contamination.
- R: The sample result was rejected due to serious deficiencies; the presence or absence of the analyte could not be confirmed.
- RA: The sample result was rejected but is still considered usable.

Sample Information

The samples listed below were collected by AECOM on September 8, 2016 as part of the PPG - North Forrest Street PDI sampling at 70 Carteret Avenue, Jersey City, New Jersey. Only the samples and parameters listed below were validated.

Field ID	Laboratory ID	Matrix	Fraction
NFS-FB20160908 (Equipment Blank)	JC27210-1	Aqueous	Hexavalent Chromium
NFS-PDI-EE16B-0.5-1.0	JC27210-2	Soil	Hexavalent Chromium
NFS-PDI-EE16B-0.5-1.0	JC27210-2R	Soil	Hexavalent Chromium
NFS-PDI-EE16B-11.0-11.5	JC27210-3	Soil	Hexavalent Chromium
NFS-PDI-EE16B-11.0-11.5	JC27210-3R	Soil	Hexavalent Chromium
NFS-PDI-EE16B-SS-0.0-0.5	JC27210-4	Soil	Hexavalent Chromium
NFS-PDI-EE16B-SS-0.0-0.5	JC27210-4R	Soil	Hexavalent Chromium

The samples were collected following the procedures detailed in the Work Order for Garfield Avenue Remedial Action (GARA) at 70 Carteret Avenue and the Field Sampling Plan/Quality Assurance Project Plan for Non-Residential and Residential Chromium Sites Hudson County, New Jersey (December 2011).

General Comments

The data package was complete. Quality control (QC) issues identified during validation are discussed below. Refer to the Target Analyte Summary Hit(s) in Attachment A for a listing of all detected results, qualified results, and associated qualifications, where applicable. The nonconformances for each section discussed below are presented in Attachment B.

MS Results

Sample NFS-PDI-EE16B-SS-0.0-0.5 (JC27210-4) was selected for the soil matrix spike analysis and used for supporting data quality recommendations. The soluble and insoluble matrix spike (MS) recoveries from the initial batch were 61.4% and 94.6%, respectively. The soluble MS recovery did not meet quality control (QC) criteria of 75-125%R. The post digestion spike (PDS) recovery was 87.87%, which met the PDS criteria of 85-115%.

Based on poor MS recoveries, less than 75%R, the MS and associated samples were reanalyzed using Method 7196. The soluble and insoluble matrix spike recoveries from the re-analysis were 85.4% and 96.9%, respectively; which met the quality control criteria of 75-125%. The post spike result for the re-analysis batch was recovered at 100.59%, which met the PDS criteria of 85-115%.

The highest detected hexavalent chromium result or the nondetect result with the lowest reporting limit (RL) was reported for each sample. The hexavalent chromium results reported from the initial analysis were qualified as estimated (J/UJ) because of the poor MS recovery.

Sample Results

Reported results (flagged B by the laboratory) that were less than the reporting limit (RL), but greater than or equal to the method detection limit (MDL) are approximate values and have been qualified as estimated (J).

Data Quality and Usability

In general, these data appear to be valid and may be used for decision-making purposes. No data were rejected. Qualified results, if applicable, are presented in Attachments A and B.

The hexavalent chromium soil result for sample NFS-PDI-EE16B-0.5-1.0 (JC27210-2) is usable as an estimated value with the potential for low bias due to low soluble MS recovery.

Sample results reported between the MDL and RL are usable as estimated values with an unknown directional bias.

ATTACHMENTS

Attachment A: Target Analyte Summary Hitlist(s)

Attachment B: Data Validation Report Form

Attachment A

Target Analyte Summary Hitlist(s)

Soil Target Analyte Summary Hit List (Hexavalent Chromium)

Site Name PPG - North Forrest Street PDI
Sampling Date September 8, 2016
Lab Name/ID SGS/Accutest, Dayton, NJ
SDG No JC27210 and JC27210R
Sample Matrix Soil
Trip Blank ID NA
Field Blank ID NFS-FB20160908

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
NFS-PDI-EE16B-0.5-1.0	JC27210-2	CHROMIUM (HEXAVALENT)	U	1.9	1.9	0.47	Qualify	2
NFS-PDI-EE16B-11.0-11.5	JC27210-3R	CHROMIUM (HEXAVALENT)	U	0.34B	0.34	0.46	Qualify	1
NFS-PDI-EE16B-SS-0.0-0.5	JC27210-4R	CHROMIUM (HEXAVALENT)	U	1.2	1.2	0.41		

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

NJDEP Laboratory Footnote

1. The reported result was greater than the MDL but less than the RL and therefore was estimated.
2. The reported value was qualified because the soluble and/or insoluble matrix recoveries were less than 75%, but greater than 50%.

Attachment B

Data Validation Report Form

Client Name: PPG Industries	Project Number: 60314351.GA.DE.PDI.NFS
Site Location: PPG - North Forrest Street PDI, Jersey City, NJ	Project Manager: Aimee Ruiter
Laboratory: SGS/Accutest, Dayton, NJ	Type of Validation: Full
Laboratory Job No: JC27210 and JC27210R	Date Checked: 10/03/2016
Validator: Charlene Livingston Flint	Peer: Constance Lapite

ITEM	YES	NO	N/A	COMMENTS
Sample results included?	X			
Reporting Limits met project requirements?	X			
Field I.D. included?	X			
Laboratory I.D. included?	X			
Did data package sample IDs match sample IDs on COC?	X			
Did electronic data deliverable (EDD) sample IDs match COC sample IDs?	X			
Did data package sample IDs match electronic data deliverable (EDD) sample IDs?	X			
Sample matrix included?	X			
Sample receipt temperature 2-6°C?	X			5.4° C
Signed COCs included?	X			
Date of sample collection included?	X			
Date of sample digestion included?	X			
Holding time to digestion met criteria? (Soils -30 days from collection to digestion.)	X			
Date of analysis included?	X			
Holding time to analysis met criteria? (Soils -168 hours from digestion to analysis; Aqueous - 24 hours from collection to analysis.)	X			
Method reference included?	X			
Laboratory Case Narrative included?	X			

Definitions: MDL - Method Detection Limit; %R - Percent Recovery; RL - Reporting Limit; RPD - Relative Percent Difference; RSD - Relative Standard Deviation ;Corr - Correlation Coefficient.

ITEM	YES	NO	N/A	COMMENTS
Initial calibration documentation included in lab package?	X			
1) Blank plus 4 standards (7196A) or blank plus 3 standards (7199)	X			
2) Correlation coefficient of =0.995 (7196A) or =0.999 (7199)	X			
3) Calibrate daily or each time instrument is set up.	X			
Calibration Check Standard (CCS) for 7196A and Quality Control Sample (QCS) for 7199 Included in Lab Package?	X			
1) %R criteria met? (90 - 110%)	X			
2) Correct frequency of one per every 10 samples	X			
3) CCS and QCS from independent source and at mid- level of calibration curve	X			
Calibration Blanks	X			
1) Analyzed prior to initial calibration standards and after each CCS/QCS?	X			
2) Absolute value should not exceed MDL.	X			
Method Blank, Field Blanks and/or Equipment Blanks Included in Lab Package?	X			
1) Method blank analyzed with each preparation batch?	X			
2) Absolute value should not exceed MDL.	X			
Eh and pH Data	X			
1) Eh and pH data was included and plotted for all samples?	X			
Soluble Matrix Spike Data Included in Lab Package?	X			JC27210-4,-4R
1) Soluble Matrix %R criteria met? (75-125%R).		X		Initial analysis did not meet QC criteria. Reanalysis OK. No qualifications made.
2) Was the spike concentration 40 mg/Kg or twice the sample concentration?	X			Spiked at 41.5 and 42.4 mg/kg.
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	X			
Insoluble Matrix Spike Data Included in Lab Package?	X			
1) Insoluble Matrix %R criteria met? (75-125%R).	X			
2) Was the spike concentration around 400 to 800 mg/Kg?		X		Spiked at 736 and 1220 mg/kg. No impact on data.
3) Was a sample spiked at the frequency of 1 per batch or 20	X			

samples?				
Post Digestion Spike	X			
1) Post Digestion Spike %R criteria met? (85-115%R).	X			
2) Was the spike concentration 40 mg/Kg or twice the sample concentration?	X			
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	X			
Sample Duplicate Data Included in Lab Package?	X			JC27210-4,-4R
1.) RPD criteria met? (RPD < 20%) if both results are $\geq 4x$ RL or control limit of \pm RL if both results are <4xRL.	X			SR<4xRL, Abs diff <RL
2) Was a sample duplicate analyzed at the frequency of 1 per batch or 20 samples?	X			
Was a Laboratory Control Sample (LCS) Included in Lab Package?	X			
1) %R criteria met? (80-120%R).	X			
2) Was an LCS analyzed at the frequency of 1/batch or 20 samples?	X			
Were any Field Duplicate samples submitted with this SDG?		X		
1) RPD criteria met? (RPD < 20%) if both results are $\geq 4x$ RL or control limit of \pm RL if both results are <4xRL.			X	
Were all sample quantitation and reporting requirements met?	X			
1) Were all solid samples reported with percent solids > 50%?	X			
2) Were any samples analyzed or reported with dilutions?		X		
Miscellaneous Items	X			
1) For soils by 7196A, was the pH within a range of 7.0-8.0?	X			
2) For soils by 7199, was the pH within a range of 9.0-9.5?			X	
3) For aqueous by 7196A, was the pH with a range of 1.5-2.5?	X			
4) For soils (3060A), was the digestion temperature 90-95C for at least 60 minutes?	X			
5) For 7199, was each sample injected twice and was the RPD ≤ 20 ?			X	

Matrix Spikes

Sample ID	Client ID	Analyte	Matrix Spike	% Recovery	Lower Limit	Upper Limit	PDS %	PDS Limits %
NFS-PDI-EE16B-SS-0.0-0.5	JC27210-4	CHROMIUM (HEXAVALENT)	Soluble	61.4	75	125	87.87	85-115
NFS-PDI-EE16B-SS-0.0-0.5	JC27210-4	CHROMIUM (HEXAVALENT)	Insoluble	94.6	75	125		
NFS-PDI-EE16B-SS-0.0-0.5	JC27210-4R	CHROMIUM (HEXAVALENT)	Insoluble	96.9	75	125	100.59	85-115
NFS-PDI-EE16B-SS-0.0-0.5	JC27210-4R	CHROMIUM (HEXAVALENT)	Soluble	85.4	75	125		

Lab Duplicates

Sample ID	Lab ID	Analyte	Sample Result	Qual	Duplicate Result	Qual	QL	Units	RPD	Action
NFS-PDI-EE16B-SS-0.0-0.5	JC27210-4	CHROMIUM (HEXAVALENT)	0.69		0.45		0.41	mg/kg	42.1	SR<4xRL, Abs Diff <RL, Accept
NFS-PDI-EE16B-SS-0.0-0.5	JC27210-4R	CHROMIUM (HEXAVALENT)	1.2		1.1		0.41	mg/kg	8.7	OK

Percent Solids

Sample ID	Percent Solids (%)	Status
NFS-PDI-EE16B-0.5-1.0	84.7	ok @50%
NFS-PDI-EE16B-11.0-11.5	86.3	ok @50%
NFS-PDI-EE16B-SS-0.0-0.5	97.5	ok @50%

SDG#: JC27210/ Method 7196

Batch: GN52092

Cr+6 ICAL 9/15/16

Soil

(p. 43 of data pkg)

x - concentration	y - response
0	0
0.01	0.008
0.05	0.041
0.1	0.082
0.3	0.25
0.5	0.427
0.8	0.657
1	0.840

(p. 43 of data pkg)

AECOM Calculated Offset	-0.0001	OK	Reported Offset	-0.0001
AECOM Slope	0.8355	OK	Reported Slope	0.8355
AECOM Calculated r	0.99984	OK	Reported r	0.99984

LCS calculation

GP106-B1

P. 21,43

Background Absorbance	0
Total absorbance	0.752
Total absorbance - background	0.752
Instrument Concentration	0.900
Sample weight (mg/kg)	0.0025
Final Volume (L)	0.1
Dilution Factor	1

AECOM Calculated LCS Result (mg/Kg)	36.0	OK	Reported Result (mg/Kg)	36.0
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%R = Found/True*100

GP106-B1

P. 21,43

True Value (mg/kg)	40
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AECOM Calculated %R	90.0	OK	Reported %R	90.0
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MS calculation

GP106-S2

P. 23,24,43

JC27210-4

Background reading	0
Total absorbance	0.285
Total absorbance - background	0.285
Instrument Concentration	0.3413
Sample weight (mg/kg)	0.00251
Final Volume (L)	0.1
Percent solids	0.975
Dilution Factor	50

AECOM Calculated MS Result (mg/Kg)	697	OK	Reported Result (mg/Kg)	697
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%R = Found/True*100

GP106-S2

P. 23,24,43

JC27210-4

True Value (mg/kg)	736
Native concentration (mg/Kg)	0.69

AECOM %R	94.6	OK	Reported %R	94.6
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Percent Solids	JC27210-4	P. 24	NFS-PDI-EE16B-SS-0.0-0.5
Empty dish weight=		17.85	
Wet weight=		25.34	
Dry weight=		25.15	
AECOM %solids =		97.5	OK
			Reported %solids= 97.5

Reporting Limit	JC27210-4	P. 11,23,43	NFS-PDI-EE16B-SS-0.0-0.5
Low Standard		0.01	
Initial weight (mg/kg)		0.0025	
Final volume (L)		0.1	
Percent solids		0.975	
Dilution Factor		1	
Reporting Limit		0.41	OK
			Reported RL (mg/Kg)= 0.41

Sample Calculations	JC27210-4	P. 11,23,43	NFS-PDI-EE16B-SS-0.0-0.5
Background reading		0.008	
Total absorbance		0.022	
Total absorbance - background		0.014	
Instrument Response		0.017	
Sample weight (mg/kg)		0.0025	
Final Volume (L)		0.1	
Percent solids		0.975	
Dilution Factor		1	
AECOM Calculated Result (mg/Kg)		0.69	OK
			Reported Result (mg/Kg) 0.69

SDG#: JC27210R/ Method 7196

Batch: GN52589

Cr+6 ICAL 9/27/16

Soil

(p. 64 of data pkg)

x - concentration	y - response
0	0
0.01	0.009
0.05	0.038
0.1	0.08
0.3	0.237
0.5	0.393
0.8	0.621
1	0.811

(p. 64 of data pkg)

AECOM Calculated Offset	-0.0017	OK	Reported Offset	-0.0017
AECOM Slope	0.7979	OK	Reported Slope	0.7979
AECOM Calculated r	0.99963	OK	Reported r	0.99963

LCS calculation

GP333-B1

P. 20,64

Background Absorbance	0
Total absorbance	0.8
Total absorbance - background	0.8
Instrument Concentration	1.005
Sample weight (mg/kg)	0.0025
Final Volume (L)	0.1
Dilution Factor	1

AECOM Calculated LCS Result (mg/Kg)	40.2	OK	Reported Result (mg/Kg)	40.2
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%R = Found/True*100

GP333-B1

P. 20,64

True Value (mg/kg)	40
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AECOM Calculated %R	100.5	OK	Reported %R	100.5
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MS calculation

GP205-S2

P. 22,28,64

JC27210-4R

Background reading	0.003
Total absorbance	0.462
Total absorbance - background	0.459
Instrument Concentration	0.5773
Sample weight (mg/kg)	0.00251
Final Volume (L)	0.1
Percent solids	0.975
Dilution Factor	50

AECOM Calculated MS Result (mg/Kg)	1180	OK	Reported Result (mg/Kg)	1180
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%R = Found/True*100

GP205-S2

P. 22,28,64

JC27210-4R

True Value (mg/kg)	1220
Native concentration (mg/Kg)	1.2

AECOM %R	96.6	OK, rounding	Reported %R	96.9
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Percent Solids	JC27210-4R	P. 28	NFS-PDI-EE16B-SS-0.0-0.5
Empty dish weight=	17.85		
Wet weight=	25.34		
Dry weight=	25.15		
AECOM %solids =	97.5	OK	Reported %solids= 97.5

Reporting Limit	JC27210-4R	P. 10,28,64	NFS-PDI-EE16B-SS-0.0-0.5
Low Standard	0.01		
Initial weight (mg/kg)	0.0025		
Final volume (L)	0.1		
Percent solids	0.975		
Dilution Factor	1		
Reporting Limit	0.41	OK	Reported RL (mg/Kg)= 0.41

Sample Calculations	JC27210-4R	P. 10,28,64	NFS-PDI-EE16B-SS-0.0-0.5
Background reading	0.013		
Total absorbance	0.034		
Total absorbance - background	0.021		
Instrument Response	0.028		
Sample weight (mg/kg)	0.0025		
Final Volume (L)	0.1		
Percent solids	0.975		
Dilution Factor	1		
AECOM Calculated Result (mg/Kg)	1.2	OK	Reported Result (mg/Kg) 1.2

Data Validation Report

Project:	PPG - Forrest Street RI and Sump Sampling
Laboratory:	SGS/Accutest, Dayton, NJ
Laboratory Job No.:	JC27227, JC27227A and JC27227R
Analysis/Method:	Hexavalent Chromium SW846 3060A/7196A TAL Metals SW846 3010A/3050B/6010C
Validation Level:	Full (Hexavalent Chromium) Limited (Vanadium)
Site Location/Address:	70 Carteret Ave, Jersey City, NJ
AECOM Project No:	60279173 GA.RI.FOR.RTC.BOR
Prepared by:	Charlene Livingston Flint /AECOM Completed on: 11/30/2016
Reviewed by:	Mary Kozik /AECOM File Name: JC27227_A_R_2016_11_30_DV Report-F

Introduction

The data were reviewed in accordance with the FSP-QAPP and the following NJDEP validation Standard Operating Procedures (SOP):

- NJDEP Office of Data Quality SOP 5.A.10, Rev 3 (September 2009), SOP for Analytical Data Validation of Hexavalent Chromium - for USEPA SW-846 Method 3060A, USEPA SW-846 Method 7196A and USEPA SW-846 Method 7199;
- NJDEP Office of Data Quality SOP 5.A.16, Rev 1 (May 2002), Quality Assurance Data Validation of Analytical Deliverables for Inorganics (based on USEPA SW-846 Methods)

The results of quality control data analyzed with site samples were used to assess the overall reliability of the data. The following qualifiers were used to identify data quality issues:

- U: Indicates the analyte was not detected in the sample above the sample reporting limit.
- J: Indicates the result was an estimated value; the associated numerical value was an approximate concentration of the analyte in the sample.
- UJ: Indicates the analyte was not detected above the reporting limit and the reporting limit was approximate.
- UB: The analyte concentration is less than or equal to three (3) times the concentration in the associated method/prep blank. The presence of the analyte in the sample is negated (UB) due to laboratory contamination.
- JB: The analyte concentration is greater than three (3) times, but less than or equal to ten (10) times the concentration in the associated method/prep blank. The presence of that analyte in the sample is considered "real". The concentration is quantitatively qualified (JB) due to method blank contamination.

R: The sample result was rejected due to serious deficiencies; the presence or absence of the analyte could not be confirmed.

RA: The sample result was rejected but is still considered usable.

Sample Information

The samples listed below were collected by AECOM on September 8, 2016 as part of the PPG - Forrest Street RI and Sump Sampling at 70 Carteret Ave, Jersey City, New Jersey. Only the samples and parameters listed below were validated.

Field ID	Laboratory ID	Matrix	Fraction*
FS12A-0.0-0.5	JC27227-1A	Soil	TAL Metals
FS12A-2.0-2.5	JC27227-2A	Soil	TAL Metals
FS12B-0.0-0.5	JC27227-3A	Soil	TAL Metals
FS12B-2.0-2.5	JC27227-4A	Soil	TAL Metals
FS12C-0.0-0.5	JC27227-5A	Soil	TAL Metals
FS12C-2.0-2.5	JC27227-6A	Soil	TAL Metals
LD-FS10AHS-1.0-1.5	JC27227-7	Soil	Hexavalent Chromium
LD-FS10AHS-2.5-3.0	JC27227-8	Soil	Hexavalent Chromium
LD-FS10AHS-3.0-3.5	JC27227-9	Soil	Hexavalent Chromium
LD-FS10AHS-4.0-4.5	JC27227-10	Soil	Hexavalent Chromium
LD-FS10AHS-5.0-5.5	JC27227-11	Soil	Hexavalent Chromium
LD-FS10AHS-6.0-6.5	JC27227-12	Soil	Hexavalent Chromium
LD-FS10AHS-7.0-7.5	JC27227-13	Soil	Hexavalent Chromium
LD-FS10AHS-8.0-8.5	JC27227-14	Soil	Hexavalent Chromium
LD-FS10AVN-0.5-1.0	JC27227-15	Soil	Hexavalent Chromium
LD-FS10AVN-10.0-10.5	JC27227-16	Soil	Hexavalent Chromium
LD-FS10AVN-12.0-12.5	JC27227-17	Soil	Hexavalent Chromium
LD-FS10AVN-2.0-2.5	JC27227-18	Soil	Hexavalent Chromium
LD-FS10AVN-2.0-2.5X (Field Duplicate of LD-FS10AVN-2.0-2.5)	JC27227-19	Soil	Hexavalent Chromium
LD-FS10AVN-4.0-4.5	JC27227-20	Soil	Hexavalent Chromium
LD-FS10AVN-6.0-6.5	JC27227-21	Soil	Hexavalent Chromium
LD-FS10AVN-8.0-8.5	JC27227-22	Soil	Hexavalent Chromium
LD-FS10AVS-0.5-1.0	JC27227-23	Soil	Hexavalent Chromium
LD-FS10AVS-0.5-1.0X (Field Duplicate of LD-FS10AVS-0.5-1.0)	JC27227-24	Soil	Hexavalent Chromium
LD-FS10AVS-10.0-10.5	JC27227-25	Soil	Hexavalent Chromium
LD-FS10AVS-12.0-12.5	JC27227-26	Soil	Hexavalent Chromium
LD-FS10AVS-14.0-14.5	JC27227-27	Soil	Hexavalent Chromium
LD-FS10AVS-14.0-14.5	JC27227-27R	Soil	Hexavalent Chromium
LD-FS10AVS-16.0-16.5	JC27227-28	Soil	Hexavalent Chromium
LD-FS10AVS-16.0-16.5	JC27227-28R	Soil	Hexavalent Chromium

Field ID	Laboratory ID	Matrix	Fraction*
LD-FS10AVS-16.5-17.0	JC27227-29	Soil	Hexavalent Chromium
LD-FS10AVS-16.5-17.0	JC27227-29R	Soil	Hexavalent Chromium
LD-FS10AVS-17.0-17.5	JC27227-30	Soil	Hexavalent Chromium
LD-FS10AVS-17.0-17.5	JC27227-30R	Soil	Hexavalent Chromium
LD-FS10AVS-18.0-18.5	JC27227-31	Soil	Hexavalent Chromium
LD-FS10AVS-18.0-18.5	JC27227-31R	Soil	Hexavalent Chromium
LD-FS10AVS-2.0-2.5	JC27227-32	Soil	Hexavalent Chromium
LD-FS10AVS-2.0-2.5	JC27227-32R	Soil	Hexavalent Chromium
LD-FS10AVS-20.0-20.5	JC27227-33	Soil	Hexavalent Chromium
LD-FS10AVS-20.0-20.5	JC27227-33R	Soil	Hexavalent Chromium
LD-FS10AVS-4.0-4.5	JC27227-34	Soil	Hexavalent Chromium
LD-FS10AVS-4.0-4.5	JC27227-34R	Soil	Hexavalent Chromium
LD-FS10AVS-6.0-6.5	JC27227-35	Soil	Hexavalent Chromium
LD-FS10AVS-6.0-6.5	JC27227-35R	Soil	Hexavalent Chromium
LD-FS10AVS-8.0-8.5	JC27227-36	Soil	Hexavalent Chromium
LD-FS10AVS-8.0-8.5	JC27227-36R	Soil	Hexavalent Chromium
LS-FS10AHN-1.0-1.5	JC27227-37	Soil	Hexavalent Chromium
LS-FS10AHN-1.0-1.5	JC27227-37R	Soil	Hexavalent Chromium
LS-FS10AHN-2.0-2.5	JC27227-38	Soil	Hexavalent Chromium
LS-FS10AHN-2.0-2.5	JC27227-38R	Soil	Hexavalent Chromium
LS-FS10AHN-3.0-3.5	JC27227-39	Soil	Hexavalent Chromium
LS-FS10AHN-3.0-3.5	JC27227-39R	Soil	Hexavalent Chromium
LS-FS10AHN-4.0-4.5	JC27227-40	Soil	Hexavalent Chromium
LS-FS10AHN-4.0-4.5	JC27227-40R	Soil	Hexavalent Chromium
LS-FS10AHN-5.0-5.5	JC27227-41	Soil	Hexavalent Chromium
LS-FS10AHN-5.0-5.5	JC27227-41R	Soil	Hexavalent Chromium
LS-FS10AHN-6.0-6.5	JC27227-42	Soil	Hexavalent Chromium
LS-FS10AHN-6.0-6.5	JC27227-42R	Soil	Hexavalent Chromium
LS-FS10AHN-7.0-7.5	JC27227-43	Soil	Hexavalent Chromium
LS-FS10AHN-7.0-7.5	JC27227-43R	Soil	Hexavalent Chromium
LS-FS10AHN-8.0-8.5	JC27227-44	Soil	Hexavalent Chromium
LS-FS10AHN-8.0-8.5	JC27227-44R	Soil	Hexavalent Chromium
NFS-RI-FB20160908 (Equipment Blank)	JC27227-45	Aqueous	Hexavalent Chromium
NFS-RI-FB20160908 (Equipment Blank)	JC27227-45A	Aqueous	TAL Metals
*TAL Metals: Vanadium			

The samples were collected following the procedures detailed in the Work Order for Garfield Avenue Remedial Action (GARA) at 70 Carteret Ave, Jersey City, NJ and the Field Sampling Plan/Quality Assurance Project Plan for Non-Residential and Residential Chromium Sites Hudson County, New Jersey (December 2011).

General Comments

The data package was complete. Quality control (QC) issues identified during validation are discussed below. Refer to the Target Analyte Summary Hitlist(s) in Attachment A for a listing of all detected results, qualified results, and associated qualifications, where applicable. The nonconformances for each section discussed below are presented in Attachment B.

Hexavalent Chromium

MS Results

Two matrix spike (MS) samples, LD-FS10AVS-10.0-10.5 (JC27227-25) and LS-FS10AHN-1.0-1.5 (JC27227-37), were analyzed with the samples in this SDG and were used for supporting data quality recommendations. MS samples are associated with field samples using matrix similarities as the primary criteria, then by analytical preparation batch when no matrix match is possible. The following table summarizes each of the MS samples and field samples associated with each, differentiating between those associated by matrix, and those associated by batch.

Spiked Sample	Samples Associated by Matrix	Samples Associated by Batch
LD-FS10AVS-10.0-10.5 (JC27227-25)	LD-FS10AVN-4.0-4.5 (JC27227-20) LD-FS10AVN-6.0-6.5 (JC27227-21) LD-FS10AVN-8.0-8.5 (JC27227-22) LD-FS10AVS-12.0-12.5 (JC27227-26) LD-FS10AVS-14.0-14.5 (JC27227-27) LS-FS10AHN-2.0-2.5 (JC27227-38) LS-FS10AHN-3.0-3.5 (JC27227-39) LS-FS10AHN-4.0-4.5 (JC27227-40) LS-FS10AHN-5.0-5.5 (JC27227-41)	None
LS-FS10AHN-1.0-1.5 (JC27227-37)	LD-FS10AHS-1.0-1.5 (JC27227-7) LD-FS10AHS-2.5-3.0 (JC27227-8) LD-FS10AHS-3.0-3.5 (JC27227-9) LD-FS10AHS-4.0-4.5 (JC27227-10) LD-FS10AHS-5.0-5.5 (JC27227-11) LD-FS10AHS-6.0-6.5 (JC27227-12) LD-FS10AHS-7.0-7.5 (JC27227-13) LD-FS10AHS-8.0-8.5 (JC27227-14) LD-FS10AVN-0.5-1.0 (JC27227-15) LD-FS10AVN-10.0-10.5 (JC27227-16) LD-FS10AVN-12.0-12.5 (JC27227-17) LD-FS10AVN-2.0-2.5 (JC27227-18) LD-FS10AVN-2.0-2.5X (JC27227-19) LD-FS10AVS-0.5-1.0 (JC27227-23) LD-FS10AVS-0.5-1.0X (JC27227-24) LD-FS10AVS-16.0-16.5 (JC27227-28) LD-FS10AVS-16.5-17.0 (JC27227-29) LD-FS10AVS-2.0-2.5 (JC27227-32) LD-FS10AVS-4.0-4.5 (JC27227-34) LD-FS10AVS-6.0-6.5 (JC27227-35) LD-FS10AVS-8.0-8.5 (JC27227-36) LS-FS10AHN-6.0-6.5 (JC27227-42) LS-FS10AHN-7.0-7.5 (JC27227-43) LS-FS10AHN-8.0-8.5 (JC27227-44)	LD-FS10AVS-17.0-17.5 (JC27227-30) LD-FS10AVS-18.0-18.5 (JC27227-31) LD-FS10AVS-20.0-20.5 (JC27227-33)

MS sample LD-FS10AVS-10.0-10.5 (JC27227-25)

Sample LD-FS10AVS-10.0-10.5, associated with samples as noted above, was selected for the soil matrix spike analysis and used for supporting data quality recommendations. The soluble and insoluble MS recoveries were 81.7% and 113.3%, respectively; which met the quality control criteria (QC) of 75-125%. The post digestion spike (PDS) recovery was 92.39%, which met the PDS criteria of 85-115%. No data qualification was required for the associated samples in this batch on the basis of spike recoveries.

MS sample LS-FS10AHN-1.0-1.5 (JC27227-37)

Sample LS-FS10AHN-1.0-1.5, associated with samples as noted above, was selected for the soil matrix spike analysis and used for supporting data quality recommendations. The soluble and insoluble MS recoveries from the initial batch were 61.0% and 103.7%, respectively. The soluble MS recovery did not meet QC criteria of 75-125%R. The PDS recovery was 93.41%, which met the PDS criteria of 85-115%.

Based on the soluble MS recovery, less than 75%R, the MS and associated samples were reanalyzed using Method 7196. The soluble and insoluble matrix spike recoveries from the re-analysis were 90.3% and 100.5%, respectively; which met the QC criteria of 75-125%. The post spike result for the re-analysis batch was recovered at 98.05%, which met the PDS criteria of 85-115%.

Since the soluble and/or insoluble MS recoveries were within the acceptable QC limit of 75-125%, no qualifications were made on results reported from the reanalysis batch; however, since the highest detected hexavalent chromium result or the nondetect hexavalent chromium result with the lowest reporting limit (RL) was reported for each soil sample from this batch, if the result was reported from the original analysis, then the reported hexavalent chromium results were qualified as estimated (J/UJ) due to the low soluble MS recovery in the original analysis.

Laboratory Duplicate Precision

There were two sets of laboratory duplicates, associated with the samples in this SDG that were selected by the laboratory to demonstrate laboratory precision capabilities:

In sample LD-FS10AVS-10.0-10.5 (JC27227-25), associated with the samples in batch GP107 (samples JC27227-7 through JC27227-26), the relative percent difference for hexavalent chromium exceeded the QC acceptance RPD; therefore, the hexavalent chromium results in the soil samples reported from this batch were qualified as estimated (J).

All QC criteria were met for sample LS-FS10AHN-1.0-1.5 (JC27227-37) which was associated with samples in batch GP121 and GP252 (samples JC27227-27 through JC27227-44). No qualifications were made on the associated samples.

Sample Results

Reported results (flagged B by the laboratory) that were less than the reporting limit (RL), but greater than or equal to the method detection limit (MDL) are approximate values and have been qualified as estimated (J).

TAL Metals

There were no QC nonconformances noted during validation, thus the data were accepted as reported by the laboratory.

Data Quality and Usability

In general, these data appear to be valid and may be used for decision-making purposes. No data were rejected. Qualified results, if applicable, are presented in Attachments A and B.

The hexavalent chromium soil results reported from the original analysis of sample LS-FS10AHN-1.0-1.5 (JC27227-25) in batch GP121 are usable as estimated values with the potential for low bias due to low soluble MS recovery.

Sample results qualified due to poor laboratory duplicate precision are usable as estimated values with an unknown directional bias.

Sample results reported between the MDL and RL are usable as estimated values with an unknown directional bias.

ATTACHMENTS

Attachment A: Target Analyte Summary Hitlist(s)

Attachment B: Data Validation Report Form

Attachment A

Target Analyte Summary Hitlist(s)

Soil Target Analyte Summary Hit List (Hexavalent Chromium)

Site Name PPG - Forrest Street RI and Sump Sampling
Sampling Date September 8, 2016
Lab Name/ID SGS/Accutest, Dayton, NJ
SDG No JC27227 and JC27227R
Sample Matrix Soil
Trip Blank ID NA
Field Blank ID NFS-RI-FB20160908

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
LD-FS10AVS-14.0-14.5	JC27227-27R	CHROMIUM (HEXAVALENT)	U	2.6	2.6	0.51		
LD-FS10AVS-16.5-17.0	JC27227-29R	CHROMIUM (HEXAVALENT)	U	0.42B	0.42	0.47	Qualify	3
LD-FS10AVS-18.0-18.5	JC27227-31R	CHROMIUM (HEXAVALENT)	U	18.3	18.3	0.46		
LD-FS10AVS-2.0-2.5	JC27227-32R	CHROMIUM (HEXAVALENT)	U	4.4	4.4	0.45		
LD-FS10AVS-4.0-4.5	JC27227-34R	CHROMIUM (HEXAVALENT)	U	3.5	3.5	0.45		
LD-FS10AVS-6.0-6.5	JC27227-35R	CHROMIUM (HEXAVALENT)	U	25.2	25.2	0.46		
LS-FS10AHN-3.0-3.5	JC27227-39R	CHROMIUM (HEXAVALENT)	U	5.8	5.8	0.44		
LS-FS10AHN-5.0-5.5	JC27227-41R	CHROMIUM (HEXAVALENT)	U	5.6	5.6	0.45		
LS-FS10AHN-7.0-7.5	JC27227-43R	CHROMIUM (HEXAVALENT)	U	11.8	11.8	0.47		
LS-FS10AHN-8.0-8.5	JC27227-44R	CHROMIUM (HEXAVALENT)	U	20.0	20.0	0.47		
LD-FS10AVS-8.0-8.5	JC27227-36	CHROMIUM (HEXAVALENT)	U	11.8	11.8	0.45	Qualify	1
LS-FS10AHN-1.0-1.5	JC27227-37	CHROMIUM (HEXAVALENT)	U	1.5	1.5	0.41	Qualify	1
LS-FS10AHN-2.0-2.5	JC27227-38	CHROMIUM (HEXAVALENT)	U	2.7	2.7	0.42		
LS-FS10AHN-4.0-4.5	JC27227-40	CHROMIUM (HEXAVALENT)	U	4.1	4.1	0.45		
LS-FS10AHN-6.0-6.5	JC27227-42	CHROMIUM (HEXAVALENT)	U	10.0	10.0	0.47	Qualify	1
LD-FS10AHS-1.0-1.5	JC27227-7	CHROMIUM (HEXAVALENT)	U	6.2	6.2	0.44	Qualify	2
Field Sample ID	Lab Sample ID	Analyte	Method	Laboratory	Validation	RL	Quality	NJDEP

			Blank (mg/kg)	Sample Result (mg/kg)	Sample Result (mg/kg)	(mg/kg)	Assurance Decision	Validation Footnote
LD-FS10AHS-2.5-3.0	JC27227-8	CHROMIUM (HEXAVALENT)	U	11.3	11.3	0.45	Qualify	2
LD-FS10AHS-3.0-3.5	JC27227-9	CHROMIUM (HEXAVALENT)	U	5.1	5.1	0.44	Qualify	2
LD-FS10AHS-4.0-4.5	JC27227-10	CHROMIUM (HEXAVALENT)	U	4.4	4.4	0.45	Qualify	2
LD-FS10AHS-5.0-5.5	JC27227-11	CHROMIUM (HEXAVALENT)	U	1.7	1.7	0.46	Qualify	2
LD-FS10AHS-6.0-6.5	JC27227-12	CHROMIUM (HEXAVALENT)	U	3.3	3.3	0.45	Qualify	2
LD-FS10AHS-7.0-7.5	JC27227-13	CHROMIUM (HEXAVALENT)	U	2.1	2.1	0.44	Qualify	2
LD-FS10AHS-8.0-8.5	JC27227-14	CHROMIUM (HEXAVALENT)	U	1.3	1.3	0.45	Qualify	2
LD-FS10AVN-0.5-1.0	JC27227-15	CHROMIUM (HEXAVALENT)	U	8.4	8.4	0.45	Qualify	2
LD-FS10AVN-10.0-10.5	JC27227-16	CHROMIUM (HEXAVALENT)	U	0.81	0.81	0.45	Qualify	2
LD-FS10AVN-12.0-12.5	JC27227-17	CHROMIUM (HEXAVALENT)	U	6.3	6.3	0.46	Qualify	2
LD-FS10AVN-2.0-2.5	JC27227-18	CHROMIUM (HEXAVALENT)	U	10.0	10.0	0.46	Qualify	2
LD-FS10AVN-2.0-2.5X	JC27227-19	CHROMIUM (HEXAVALENT)	U	9.4	9.4	0.47	Qualify	2
LD-FS10AVN-4.0-4.5	JC27227-20	CHROMIUM (HEXAVALENT)	U	2.3	2.3	0.49	Qualify	2
LD-FS10AVN-6.0-6.5	JC27227-21	CHROMIUM (HEXAVALENT)	U	1.9	1.9	0.46	Qualify	2
LD-FS10AVN-8.0-8.5	JC27227-22	CHROMIUM (HEXAVALENT)	U	3.2	3.2	0.43	Qualify	2
LD-FS10AVS-0.5-1.0	JC27227-23	CHROMIUM (HEXAVALENT)	U	2.1	2.1	0.44	Qualify	2
LD-FS10AVS-0.5-1.0X	JC27227-24	CHROMIUM (HEXAVALENT)	U	1.9	1.9	0.44	Qualify	2
LD-FS10AVS-10.0-10.5	JC27227-25	CHROMIUM (HEXAVALENT)	U	5.3	5.3	0.48	Qualify	2
LD-FS10AVS-12.0-12.5	JC27227-26	CHROMIUM (HEXAVALENT)	U	1.7	1.7	0.48	Qualify	2
LD-FS10AVS-16.0-16.5	JC27227-28	CHROMIUM (HEXAVALENT)	U	0.37B	0.37	0.49	Qualify	1,3
LD-FS10AVS-17.0-17.5	JC27227-30	CHROMIUM (HEXAVALENT)	U	U	U	0.47	Qualify	1
LD-FS10AVS-20.0-20.5	JC27227-33	CHROMIUM (HEXAVALENT)	U	0.50	0.50	0.46	Qualify	1

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

NJDEP Laboratory Footnote

1. The reported value was qualified because the MS recovery was less than 75 %, but greater than 50%.
2. In the Duplicate Sample Analysis, Hexavalent Chromium fell outside the control limits of + 20 percent for sample results > 4xRL or + RL for sample results < 4xRL. Therefore, the result was qualified.
3. The reported result was greater than the MDL but less than the RL and qualified (J) as estimated by the laboratory.

Soil Target Analyte Summary Hit List (TAL Metals)

Site Name PPG - Forrest Street RI and Sump Sampling
Sampling Date September 8, 2016
Lab Name/ID SGS/Accutest, Dayton, NJ
SDG No JC27227A
Sample Matrix Soil
Trip Blank ID NA
Field Blank ID NFS-RI-FB20160908

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
FS12A-0.0-0.5	JC27227-1	VANADIUM	U	42.3	42.3	5.2		
FS12A-2.0-2.5	JC27227-2	VANADIUM	U	30.7	30.7	6.1		
FS12B-0.0-0.5	JC27227-3	VANADIUM	U	38.3	38.3	5.4		
FS12B-2.0-2.5	JC27227-4	VANADIUM	U	33.0	33.0	6.3		
FS12C-0.0-0.5	JC27227-5	VANADIUM	U	39.2	39.2	5.7		
FS12C-2.0-2.5	JC27227-6	VANADIUM	U	16.8	16.8	5.8		

Note: A "U" under Method Blank column indicates a nondetect result.

Attachment B

Data Validation Report Form

Client Name: PPG Industries		Project Number: 60279173 GA.RI.FOR.RTC.BOR			
Site Location: PPG - Forrest Street RI and Sump Sampling , Jersey City, NJ		Project Manager: William Spronz			
Laboratory: SGS/Accutest, Dayton, NJ		Type of Validation: Full (Hexavalent Chromium)			
Laboratory Job No: JC27227 and JC27227R		Date Checked: 11/30/2016			
Validator: Charlene Livingston Flint		Peer: Mary Kozik			
ITEM	YES	NO	N/A	COMMENTS	
Sample results included?	X				
Reporting Limits met project requirements?	X				
Field I.D. included?	X				
Laboratory I.D. included?	X				
Did data package sample IDs match sample IDs on COC?	X				
Did electronic data deliverable (EDD) sample IDs match COC sample IDs?	X				
Did data package sample IDs match electronic data deliverable (EDD) sample IDs?	X				
Sample matrix included?	X				
Sample receipt temperature 2-6°C?	X			5.4° C	
Signed COCs included?	X				
Date of sample collection included?	X				
Date of sample digestion included?	X				
Holding time to digestion met criteria? (Soils -30 days from collection to digestion.)	X				
Date of analysis included?	X				
Holding time to analysis met criteria? (Soils -168 hours from digestion to analysis; Aqueous - 24 hours from collection to analysis.)	X				
Method reference included?	X				
Laboratory Case Narrative included?	X				
Definitions: MDL - Method Detection Limit; %R - Percent Recovery; RL - Reporting Limit; RPD - Relative Percent Difference; RSD - Relative Standard Deviation :Corr - Correlation Coefficient.					

ITEM	YES	NO	N/A	COMMENTS
Initial calibration documentation included in lab package?	X			
1) Blank plus 4 standards (7196A) or blank plus 3 standards (7199)	X			
2) Correlation coefficient of >0.995 (7196A) or >0.999 (7199)	X			
3) Calibrate daily or each time instrument is set up.	X			
Calibration Check Standard (CCS) for 7196A and Quality Control Sample (QCS) for 7199 Included in Lab Package?	X			
1) %R criteria met? (90 - 110%)	X			
2) Correct frequency of one per every 10 samples	X			
3) CCS and QCS from independent source and at mid- level of calibration curve	X			
Calibration Blanks	X			
1) Analyzed prior to initial calibration standards and after each CCS/QCS?	X			
2) Absolute value should not exceed MDL.	X			
Method Blank, Field Blanks and/or Equipment Blanks Included in Lab Package?	X			
1) Method blank analyzed with each preparation batch?	X			
2) Absolute value should not exceed MDL.	X			
Eh and pH Data	X			
1) Eh and pH data was included and plotted for all samples?	X			
Soluble Matrix Spike Data Included in Lab Package?	X			2 Sets. JC27227-25 and JC27727-37, -37R
1) Soluble Matrix %R criteria met? (75-125%R).		X		JC27727-37 did not meet QC criteria of 75-125%. JC27227-25 met QC criteria. See table.
2) Was the spike concentration 40 mg/Kg or twice the sample concentration?		X		Spiked at 50.4, 42 and 40.5 mg/kg. No impact on data.
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	X			
Insoluble Matrix Spike Data Included in Lab Package?	X			
1) Insoluble Matrix %R criteria met? (75-125%R).	X			
2) Was the spike concentration around 400 to 800 mg/Kg?		X		Spiked at 1460, 949 and 1130 mg/kg. No impact on data.
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	X			

Post Digestion Spike	X			
1) Post Digestion Spike %R criteria met? (85-115%R).	X			
2) Was the spike concentration 40 mg/Kg or twice the sample concentration?	X			
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	X			
Sample Duplicate Data Included in Lab Package?	X			2 sets. JC27227-25 and JC27227-37, -37R
1) RPD criteria met? (RPD < 20%) if both results are ≥4x RL or control limit of ± RL if both results are <4xRL.		X		See table.
2) Was a sample duplicate analyzed at the frequency of 1 per batch or 20 samples?	X			
Was a Laboratory Control Sample (LCS) Included in Lab Package?	X			
1) %R criteria met? (80-120%R).	X			
2) Was an LCS analyzed at the frequency of 1/batch or 20 samples?	X			
Were any Field Duplicate samples submitted with this SDG?	X			2 sets. JC27227-18 & JC27227-19 and JC27227-23 & JC27227-24. No qualifications.
1) RPD criteria met? (RPD < 20%) if both results are ≥4x RL or control limit of ± RL if both results are <4xRL.	X			
Were all sample quantitation and reporting requirements met?	X			
1) Were all solid samples reported with percent solids > 50%?	X			
2) Were any samples analyzed or reported with dilutions?		X		
Miscellaneous Items	X			
1) For soils by 7196A, was the pH within a range of 7.0-8.0?	X			
2) For soils by 7199, was the pH within a range of 9.0-9.5?			X	
3) For aqueous by 7196A, was the pH with a range of 1.5-2.5?	X			
4) For soils (3060A), was the digestion temperature 90-95C for at least 60 minutes?	X			
5) For 7199, was each sample injected twice and was the RPD ≤20?			X	
Chromium result greater than corresponding hexavalent chromium result where applicable?			X	

Matrix Spikes

Sample ID	Lab ID	Analyte	Matrix Spike	% Recovery	Lower Limit	Upper Limit	PDS %	PDS Limits %
LS-FS10AHN-1.0-1.5	JC27227-37	CHROMIUM (HEXAVALENT)	Soluble	61.0	75	125	93.41	85-115
LS-FS10AHN-1.0-1.5	JC27227-37	CHROMIUM (HEXAVALENT)	Insoluble	103.7	75	125		
LS-FS10AHN-1.0-1.5	JC27227-37R	CHROMIUM (HEXAVALENT)	Soluble	90.3	75	125	98.05	85-115
LS-FS10AHN-1.0-1.5	JC27227-37R	CHROMIUM (HEXAVALENT)	Insoluble	100.5	75	125		
LD-FS10AVS-10.0-10.5	JC27227-25	CHROMIUM (HEXAVALENT)	Soluble	81.7	75	125	92.39	85-115
LD-FS10AVS-10.0-10.5	JC27227-25	CHROMIUM (HEXAVALENT)	Insoluble	113.3	75	125		

Lab Duplicates

Sample ID	Lab ID	Analyte	Sample Result	Qual	Duplicate Result	Qual	QL	Units	RPD	Action
LD-FS10AVS-10.0-10.5	JC27227-25	CHROMIUM (HEXAVALENT)	5.3		14.4		0.48	mg/kg	92.4	SR>4xRL, Estimate (J/UJ)
LS-FS10AHN-1.0-1.5	JC27227-37	CHROMIUM (HEXAVALENT)	1.5		1.7		0.41	mg/kg	12.5	OK
LS-FS10AHN-1.0-1.5	JC27227-37R	CHROMIUM (HEXAVALENT)	1.3		1.6		0.41	mg/kg	20.7	OK

SDG#: JC27227/ Method 7196

Batch: GN52070

Cr+6 ICAL 9/15/16

Soil

(p. 123 of data pkg)

x - concentration	y - response
0	0
0.01	0.008
0.05	0.041
0.1	0.079
0.3	0.21
0.5	0.364
0.8	0.590
1	0.770

(p. 123 of data pkg)

AECOM Calculated Offset	-0.0028	OK	Reported Offset	-0.0028
AECOM Slope	0.7551	OK	Reported Slope	0.7551
AECOM Calculated r	0.99929	OK	Reported r	0.99929

LCS calculation

GP107-B1

P. 88,123

Background Absorbance	0
Total absorbance	0.711
Total absorbance - background	0.711
Instrument Concentration	0.945
Sample weight (mg/kg)	0.0025
Final Volume (L)	0.1
Dilution Factor	1

AECOM Calculated LCS Result (mg/Kg)	37.8	OK	Reported Result (mg/Kg)	37.8
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%R = Found/True*100

GP107-B1

P. 88,123

True Value (mg/kg)	40
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AECOM Calculated %R	94.5	OK	Reported %R	94.5
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MS calculation

GP107-S1

P. 90,94,123

JC27227-25

Background reading	0.033
Total absorbance	0.726
Total absorbance - background	0.693
Instrument Concentration	0.9214
Sample weight (mg/kg)	0.0024
Final Volume (L)	0.1
Percent solids	0.826
Dilution Factor	1

AECOM Calculated MS Result (mg/Kg)	46.5	OK	Reported Result (mg/Kg)	46.5
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%R = Found/True*100

GP107-S1

P. 90,94,123

JC27227-25

True Value (mg/kg)	50.4
Native concentration (mg/Kg)	5.3

AECOM %R	81.7	OK	Reported %R	81.7
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Percent Solids

JC27227-25

P. 94

LD-FS10AVS-10.0-10.5

Empty dish weight=	20.51
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Wet weight= 25.80
 Dry weight= 24.88

AECOM %solids =	82.6	OK	Reported %solids=	82.6
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Reporting Limit **JC27227-25** **P. 94,123** **LD-FS10AVS-10.0-10.5**

Low Standard 0.01
 Initial weight (mg/kg) 0.0024
 Final volume (L) 0.1
 Percent solids 0.826
 Dilution Factor 1

Reporting Limit	0.50	OK, rounding	Reported RL (mg/Kg)=	0.48
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Sample Calculations

JC27227-25 **P. 94,123** **LD-FS10AVS-10.0-10.5**

Background reading 0.023
 Total absorbance 0.1
 Total absorbance - background 0.077
 Instrument Response 0.106
 Sample weight (mg/kg) 0.0024
 Final Volume (L) 0.1
 Percent solids 0.826
 Dilution Factor 1

AECOM Calculated Result (mg/Kg)	5.3	OK	Reported Result (mg/Kg)	5.3
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Associated with sample JC27227-7 through JC27227-26

SDG#: JC27227/Method 7196

Batch: GN52084

Cr+6 ICAL 9/15/16

Soil

(p. 132 of data pkg)

x - concentration	y - response
0	0
0.01	0.008
0.05	0.041
0.1	0.082
0.3	0.25
0.5	0.427
0.8	0.657
1	0.840

(p. 132 of data pkg)

AECOM Calculated Offset	-0.0001	OK	Reported Offset	-0.0001
AECOM Slope	0.8355	OK	Reported Slope	0.8355
AECOM Calculated r	0.99984	OK	Reported r	0.99984

LCS calculation

GP121-B1

P. 88,132

Background Absorbance	0
Total absorbance	0.751
Total absorbance - background	0.751
Instrument Concentration	0.899
Sample weight (mg/kg)	0.0025
Final Volume (L)	0.1
Dilution Factor	1

AECOM Calculated LCS Result (mg/Kg)	36.0	OK	Reported Result (mg/Kg)	36.0
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%R = Found/True*100

GP121-B1

P. 88,132

True Value (mg/kg)	40
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AECOM Calculated %R	89.9	OK, rounding	Reported %R	90.0
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MS calculation

GP121-S1

P. 90,96,132

JC27227-37

Background reading	0.005
Total absorbance	0.543
Total absorbance - background	0.538
Instrument Concentration	0.6441
Sample weight (mg/kg)	0.00247
Final Volume (L)	0.1
Percent solids	0.964
Dilution Factor	1

AECOM Calculated MS Result (mg/Kg)	27.1	OK	Reported Result (mg/Kg)	27.1
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%R = Found/True*100

GP121-S1

P. 90,96,132

JC27227-37

True Value (mg/kg)	42
Native concentration (mg/Kg)	1.5

AECOM %R	60.8	OK, rounding	Reported %R	61.0
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Percent Solids	JC27227-37	P. 96	LS-FS10AHN-1.0-1.5
Empty dish weight=	17.22		
Wet weight=	24.48		
Dry weight=	24.22		
AECOM %solids =	96.4	OK	Reported %solids= 96.4

Reporting Limit	JC27227-37	P. 47,96,132	LS-FS10AHN-1.0-1.5
Low Standard	0.01		
Initial weight (mg/kg)	0.00244		
Final volume (L)	0.1		
Percent solids	0.964		
Dilution Factor	1		
Reporting Limit	0.43	OK, rounding	Reported RL (mg/Kg)= 0.41

Sample Calculations	JC27227-37	P. 47,96,132	LS-FS10AHN-1.0-1.5
Background reading	0.005		
Total absorbance	0.034		
Total absorbance - background	0.029		
Instrument Response	0.035		
Sample weight (mg/kg)	0.00244		
Final Volume (L)	0.1		
Percent solids	0.964		
Dilution Factor	1		
AECOM Calculated Result (mg/Kg)	1.5	OK	Reported Result (mg/Kg) 1.5

Associated with samples JC27227-27 through JC27227-44

SDG#: JC27227R/ Method 7196

Batch: GN52404

Cr+6 ICAL 9/22/16

Soil

(p. 79 of data pkg)

x - concentration	y - response
0	0
0.01	0.008
0.05	0.041
0.1	0.082
0.3	0.234
0.5	0.399
0.8	0.640
1	0.797

(p. 79 of data pkg)

AECOM Calculated Offset	-0.000001	OK	Reported Offset	-0.000001
AECOM Slope	0.7975	OK	Reported Slope	0.7975
AECOM Calculated r	0.99997	OK	Reported r	0.99997

LCS calculation

GP252-B1 P. 49,79

Background Absorbance	0
Total absorbance	0.718
Total absorbance - background	0.718
Instrument Concentration	0.900
Sample weight (mg/kg)	0.0025
Final Volume (L)	0.1
Dilution Factor	1

AECOM Calculated LCS Result (mg/Kg)	36.0	OK	Reported Result (mg/Kg)	36.0
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%R = Found/True*100

GP252-B1 P. 49,79

True Value (mg/kg)	40
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AECOM Calculated %R	90.0	OK	Reported %R	90.0
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MS calculation

GP662-S1 P. 51,56,79 JC27227-37R

Background reading	0.005
Total absorbance	0.751
Total absorbance - background	0.746
Instrument Concentration	0.9355
Sample weight (mg/kg)	0.00256
Final Volume (L)	0.1
Percent solids	0.964
Dilution Factor	1

AECOM Calculated MS Result (mg/Kg)	37.9	OK	Reported Result (mg/Kg)	37.9
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%R = Found/True*100

GP662-S1 P. 51,56,79 JC27227-37R

True Value (mg/kg)	40.5
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Native concentration (mg/Kg)	1.3
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AECOM %R	90.4	OK, rounding	Reported %R	90.3
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Percent Solids

JC27227-37R P. 56 LS-FS10AHN-1.0-1.5

Empty dish weight=	17.22
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Wet weight=	24.48
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Dry weight=	24.22
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AECOM %solids =	96.4	OK	reported %solids=	96.4
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Reporting Limit **JC27227-37R** **P. 20,56,79** **LS-FS10AHN-1.0-1.5**

Low Standard	0.01
Initial weight (mg/kg)	0.00247
Final volume (L)	0.1
Percent solids	0.964
Dilution Factor	1

Reporting Limit	0.42	OK, rounding	Reported RL (mg/Kg)=	0.41
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Sample Calculations**JC27227-37R** **P. 20,56,79** **LS-FS10AHN-1.0-1.5**

Background reading	0.003
Total absorbance	0.028
Total absorbance - background	0.025
Instrument Response	0.031
Sample weight (mg/kg)	0.00247
Final Volume (L)	0.1
Percent solids	0.964
Dilution Factor	1

AECOM Calculated Result (mg/Kg)	1.3	OK	Reported Result (mg/Kg)	1.3
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Associated with samples JC27227-27R through JC27227-44R

Client Name: PPG Industries		Project Number: 60279173 GA.RI.FOR.RTC.BOR			
Site Location: PPG - Forrest Street RI and Sump Sampling		Project Manager: William Spronz			
Laboratory: SGS/Accutest, Dayton, NJ		Type of Validation: Limited (Vanadium)			
Laboratory Job No: JC27227A		Date Checked: 11/30/2016			
Validator: Charlene Livingston Flint		Peer: Mary Kozik			
ITEM	YES	NO	N/A	COMMENTS	
Sample results included?	X				
Reporting Limits met project requirements?	X				
Field I.D. included?	X				
Laboratory I.D. included?	X				
Did data package sample IDs match sample IDs on COC?	X				
Did electronic data deliverable (EDD) sample IDs match COC sample IDs?	X				
Did data package sample IDs match electronic data deliverable (EDD) sample IDs?	X				
Sample matrix included?	X				
Sample receipt temperature 2-6°C?	X			5.4°C	
Signed COCs included?	X				
Date of sample collection included?	X				
Date of sample digestion included?	X				
Date of analysis included?	X				
Holding time met QC criteria? (Metals -180 days from sample collection; Mercury - 28 days from sample collection. If HT exceeded by 10 days R all results.	X				
Method reference included?	X				
Laboratory Case Narrative included?	X				
<p>Definitions: MDL - Method Detection Limit; %R - Percent Recovery; RL - Reporting Limit; RPD - Relative Percent Difference; RSD - Relative Standard Deviation :Corr - Correlation Coefficient.</p>					

ITEM	YES	NO	N/A	COMMENTS
Sample dilutions?		X		
Initial calibration documentation included in lab package?			X	N/A for Limited Validation
1) Calibrate daily or each time instrument is set up.			X	
2) ICP (6010) -Blank plus 1 standard?			X	
3) Hg (7470/7471) -Blank plus 5 standards?			X	
Initial Calibration Verification Standard (ICV) for ICP (6010) and Initial Calibration Check Standard (ICCS) for Hg (7470/7471) included in lab package?			X	N/A for Limited Validation
1) Analyzed immediately after initial calibration?			X	
2) %R criteria met? (90-110%).			X	
3) Spot check ICV/ICCS results for several analytes.			X	
Continuing Calibration Verification Standard (CCV) for ICP (6010) and Calibration Check Standard (CCS) for Hg (7470/7471) included in Lab Package?			X	N/A for Limited Validation
1) Analyzed immediately after each ICV/ICC/CB and after every 10 samples?			X	
2) CCS and CCV from independent source and at mid- level of calibration curve.			X	
3) %R criteria met? (90-110%R			X	
4) Spot check CCV/CCS results for several analytes.			X	
Low Calibration Standard (CRI) included in Lab Package?			X	N/A for Limited Validation
1) %R criteria met?			X	
Calibration Blanks			X	N/A for Limited Validation
1) Analyzed after daily calibration and after each ICV/ICC/CCV/CCS and after every 10 samples?			X	
2) Absolute value <3xIDL?			X	
Method Blank Included in Lab Package?	X			
1) Method blank analyzed with each preparation batch or every SDG, or 1/20 samples?	X			
2) Method blank analyzed 1/20 samples?	X			
3) MB results nondetect?	X			
4) Negative MB result reported?		X		
Field Blanks/Equipment Blanks Included in Lab Package?	X			

1) FB/EB result non-detect?	X			
ICP Interference Check Sample (ICS) included in Lab Package?			X	N/A for Limited Validation
1) Analyzed at beginning of analytical run?			X	
2) %R criteria met?			X	
3) Spot check accuracy of %Rs			X	
Matrix Spike/Matrix Spike Duplicate Data Included in Lab Package?	X			Batch QC. QC not evaluated.
1) MS/MSD %R (75-125%R) and RPD (+20%) criteria met?			X	
2) Was a sample spiked at the frequency of 1/batch or 20 samples?			X	
3) Was the MS performed on a site sample?		X		
4) Was the MS performed on a FB/EB or TB?			X	
Post Digestion Spike			X	
1) %R criteria met? (75-125%R)			X	
2) Was the spike performed on a FB/EB or TB? If yes, J all sample data.			X	
3) Was a sample spiked at the frequency of 1/batch or 20 samples?			X	
Laboratory Duplicate Data Included in Lab Package?		X		
Aqueous - RPD ≤20%			X	
Soil – RPD≤35%			X	
Was a Laboratory Control Sample (LCS) Included in Lab Package?	X			
1) LCS %R criteria met? (80-120%R).	X			
2) Was an LCS analyzed at the frequency of 1/batch or 20 samples?	X			
Serial Dilution			X	N/A for Limited Validation
1) %D (<10%R) criteria met?			X	
2) Was the frequency 1/batch or 20 samples?			X	
3) Was a site sample used?		X		
4) Was a FB/EB or TB used? If yes, J all sample data.			X	
5) Spot check accuracy of %Ds.			X	

Field Duplicate Data included in Lab Package?		X		
Aqueous - RPD ≤20%			X	
Soil - RPD ≤35%			X	
Percent Solids data included in Lab Package?	X			
1) %Solids criteria (Reg 2 criteria) met? (>=50%)	X			
Chromium result greater than corresponding hexavalent chromium result where applicable?			X	

Data Validation Report

Project:	PPG - North Forest Street PDI
Laboratory:	SGS/Accutest, Dayton, NJ
Laboratory Job No.:	JC27321, JC27321R and JC27321T
Analysis/Method:	Hexavalent Chromium SW846 3060A/7196A
Validation Level:	Full
Site Location/Address:	70 Carteret Avenue
AECOM Project No:	60314351.GA.DE.PDI.NFS
Prepared by:	Charlene Livingston Flint /AECOM
Completed on:	10/05/2016
Reviewed by:	Mary Kozik /AECOM
File Name:	JC27321_R_T_2016-10-05_DVReport-F

Introduction

The data were reviewed in accordance with the FSP-QAPP and the following NJDEP validation Standard Operating Procedure (SOP):

- NJDEP Office of Data Quality SOP 5.A.10, Rev 3 (September 2009), SOP for Analytical Data Validation of Hexavalent Chromium - for USEPA SW-846 Method 3060A, USEPA SW-846 Method 7196A and USEPA SW-846 Method 7199;

The results of quality control data analyzed with site samples were used to assess the overall reliability of the data. The following qualifiers were used to identify data quality issues:

- U: Indicates the analyte was not detected in the sample above the sample reporting limit.
- J: Indicates the result was an estimated value; the associated numerical value was an approximate concentration of the analyte in the sample.
- UJ: Indicates the analyte was not detected above the reporting limit and the reporting limit was approximate.
- UB: The analyte concentration is less than or equal to three (3) times the concentration in the associated method/prep blank. The presence of the analyte in the sample is negated (UB) due to laboratory contamination.
- JB: The analyte concentration is greater than three (3) times, but less than or equal to ten (10) times the concentration in the associated method/prep blank. The presence of that analyte in the sample is considered "real". The concentration is quantitatively qualified (JB) due to method blank contamination.
- R: The sample result was rejected due to serious deficiencies; the presence or absence of the analyte could not be confirmed.
- RA: The sample result was rejected but is still considered usable.

Sample Information

The samples listed below were collected by AECOM on September 2, 2016 and September 9, 2016 as part of the PPG - North Forest Street PDI sampling at 70 Carteret Avenue, Jersey City, New Jersey. Only the samples and parameters listed below were validated.

Field ID	Laboratory ID	Matrix	Fraction
NFS-FB20160909 (Equipment Blank)	JC27321-1	Aqueous	Hexavalent Chromium
NFS-PDI-CC12B-0.0-0.5	JC27321-2, 2R	Soil	Hexavalent Chromium
NFS-PDI-CC12B-10.0-10.5	JC27321-3, 3R	Soil	Hexavalent Chromium
NFS-PDI-CC12B-12.0-12.5	JC27321-4, 4R	Soil	Hexavalent Chromium
NFS-PDI-CC12B-14.0-14.5	JC27321-5, 5R	Soil	Hexavalent Chromium
NFS-PDI-CC12B-16.0-16.5	JC27321-6, 6R	Soil	Hexavalent Chromium
NFS-PDI-CC12B-18.0-18.5	JC27321-7, 7R	Soil	Hexavalent Chromium
NFS-PDI-CC12B-2.0-2.5	JC27321-8, 8R	Soil	Hexavalent Chromium
NFS-PDI-CC12B-20.0-20.5	JC27321-9, 9R	Soil	Hexavalent Chromium
NFS-PDI-CC12B-4.0-4.5	JC27321-10, 10R	Soil	Hexavalent Chromium
NFS-PDI-CC12B-4.0-4.5X (Field Duplicate of NFS-PDI-CC12B-4.0-4.5)	JC27321-11, 11R	Soil	Hexavalent Chromium
NFS-PDI-CC12B-6.0-6.5	JC27321-12, 12R	Soil	Hexavalent Chromium
NFS-PDI-CC12B-8.0-8.5	JC27321-13, 13R	Soil	Hexavalent Chromium
NFS-PDI-CC12B-8.5-9.0	JC27321-14, 14R	Soil	Hexavalent Chromium
NFS-PDI-DD11B-1.0-1.5	JC27321-15, 15R	Soil	Hexavalent Chromium
NFS-PDI-DD11B-10.0-10.5	JC27321-16, 16R	Soil	Hexavalent Chromium
NFS-PDI-DD11B-11.0-11.5	JC27321-17, 17R	Soil	Hexavalent Chromium
NFS-PDI-DD11B-11.0-11.5X (Field Duplicate of NFS-PDI-DD11B-11.0-11.5)	JC27321-18, 18R	Soil	Hexavalent Chromium
NFS-PDI-DD11B-13.0-13.5	JC27321-19, 19R	Soil	Hexavalent Chromium
NFS-PDI-DD11B-15.0-15.5	JC27321-20, 20R	Soil	Hexavalent Chromium
NFS-PDI-DD11B-17.0-17.5	JC27321-21, 21R	Soil	Hexavalent Chromium
NFS-PDI-DD11B-19.0-19.5	JC27321-22	Soil	Hexavalent Chromium
NFS-PDI-DD11B-20.0-20.5	JC27321-23	Soil	Hexavalent Chromium
NFS-PDI-DD11B-3.0-3.5	JC27321-24	Soil	Hexavalent Chromium
NFS-PDI-DD11B-5.0-5.5	JC27321-25	Soil	Hexavalent Chromium
NFS-PDI-DD11B-7.0-7.5	JC27321-26	Soil	Hexavalent Chromium
NFS-PDI-DD11B-9.0-9.5	JC27321-27	Soil	Hexavalent Chromium
NFS-PDI-DD11B-9.5-10.0	JC27321-28	Soil	Hexavalent Chromium
NFS-PDI-T15B-0.5-1.0	JC27321-29	Soil	Hexavalent Chromium
NFS-PDI-T15B-10.0-10.5	JC27321-30	Soil	Hexavalent Chromium
NFS-PDI-T15B-12.0-12.5	JC27321-31	Soil	Hexavalent Chromium
NFS-PDI-T15B-14.0-14.5	JC27321-32	Soil	Hexavalent Chromium
NFS-PDI-T15B-16.0-16.5	JC27321-33	Soil	Hexavalent Chromium
NFS-PDI-T15B-18.0-18.5	JC27321-34	Soil	Hexavalent Chromium
NFS-PDI-T15B-2.0-2.5	JC27321-35	Soil	Hexavalent Chromium

Field ID	Laboratory ID	Matrix	Fraction
NFS-PDI-T15B-4.0-4.5	JC27321-36	Soil	Hexavalent Chromium
NFS-PDI-T15B-6.0-6.5	JC27321-37	Soil	Hexavalent Chromium
NFS-PDI-T15B-6.0-6.5X (Field Duplicate of NFS-PDI-T15B-6.0-6.5)	JC27321-38	Soil	Hexavalent Chromium
NFS-PDI-T15B-8.0-8.5	JC27321-39	Soil	Hexavalent Chromium
NFS-PDI-U15B-0.3-0.8	JC27321-40	Soil	Hexavalent Chromium
NFS-PDI-U15B-10.0-10.5	JC27321-41	Soil	Hexavalent Chromium
NFS-PDI-U15B-12.0-12.5	JC27321-42, 42T	Soil	Hexavalent Chromium
NFS-PDI-U15B-14.0-14.5	JC27321-43, 43T	Soil	Hexavalent Chromium
NFS-PDI-U15B-2.0-2.5	JC27321-44, 44T	Soil	Hexavalent Chromium
NFS-PDI-U15B-4.0-4.5	JC27321-45, 45T	Soil	Hexavalent Chromium
NFS-PDI-U15B-6.0-6.5	JC27321-46, 46T	Soil	Hexavalent Chromium
NFS-PDI-U15B-8.0-8.5	JC27321-47, 47T	Soil	Hexavalent Chromium
NFS-PDI-W16B-0.2-0.7	JC27321-48, 48T	Soil	Hexavalent Chromium
NFS-PDI-W16B-1.0-1.5	JC27321-49, 49T	Soil	Hexavalent Chromium
NFS-PDI-W16B-3.0-3.5	JC27321-50, 50T	Soil	Hexavalent Chromium
NFS-PDI-W16B-5.0-5.5	JC27321-51, 51T	Soil	Hexavalent Chromium
NFS-PDI-W16B-7.0-7.5	JC27321-52, 52T	Soil	Hexavalent Chromium
NFS-PDI-W16B-8.0-8.5	JC27321-53, 53T	Soil	Hexavalent Chromium
NFS-PDI-X16B-10.0-10.5	JC27321-54, 54T	Soil	Hexavalent Chromium
NFS-PDI-X16B-12.0-12.5	JC27321-55, 55T	Soil	Hexavalent Chromium
NFS-PDI-X16B-6.0-6.5	JC27321-56, 56T	Soil	Hexavalent Chromium
NFS-PDI-X16B-8.0-8.5	JC27321-57, 57T	Soil	Hexavalent Chromium

The samples were collected following the procedures detailed in the Work Order for Garfield Avenue Remedial Action (GARA) at 70 Carteret Avenue and the Field Sampling Plan/Quality Assurance Project Plan for Non-Residential and Residential Chromium Sites Hudson County, New Jersey (December 2011).

General Comments

The data package was complete. Quality control (QC) issues identified during validation are discussed below. Refer to the Target Analyte Summary Hit(s) in Attachment A for a listing of all detected results, qualified results, and associated qualifications, where applicable. The nonconformances for each section discussed below are presented in Attachment B.

MS Results

Three matrix spike (MS) samples, NFS-PDI-CC12B-6.0-6.5 (JC27321-12), NFS-PDI-T15B-6.0-6.5 (JC27321-37) and NFS-PDI-X16B-8.0-8.5 (JC27321-57) were analyzed with the samples in this SDG and were used for supporting data quality recommendations. MS samples are associated with field samples using matrix similarities as the primary criteria, then by analytical preparation batch when no matrix match is possible. The following table summarizes each of the MS samples and field samples associated with each, differentiating between those associated by matrix, and those associated by batch.

Spiked Sample	Samples Associated by Matrix	Samples Associated by Batch
NFS-PDI-CC12B-6.0-6.5 (JC27321-12)	NFS-PDI-CC12B-4.0-4.5 (JC27321-10) NFS-PDI-CC12B-4.0-4.5 X (JC27321-11) NFS-PDI-CC12B-6.0-6.5 (JC27321-12) NFS-PDI-DD11B-3.0-3.5 (JC27321-24) NFS-PDI-DD11B-5.0-5.5 (JC27321-25) NFS-PDI-T15B-0.5-1.0 (JC27321-29) NFS-PDI-T15B-2.0-2.5 (JC27321-35) NFS-PDI-U15B-0.3-0.8 (JC27321-40)	NFS-PDI-CC12B-0.0-0.5 (JC27321-2) NFS-PDI-CC12B-2.0-2.5 (JC27321-8) NFS-PDI-DD11B-1.0-1.5 (JC27321-15)
NFS-PDI-T15B-6.0-6.5 (JC27321-37)	NFS-PDI-CC12B-10.0-10.5 (JC27321-3) NFS-PDI-CC12B-12.0-12.5 (JC27321-4) NFS-PDI-CC12B-14.0-14.5 (JC27321-5) NFS-PDI-CC12B-16.0-16.5 (JC27321-6) NFS-PDI-CC12B-18.0-18.5 (JC27321-7) NFS-PDI-CC12B-20.0-20.5 (JC27321-9) NFS-PDI-CC12B-8.0-8.5 (JC27321-13) NFS-PDI-CC12B-8.5-9.0 (JC27321-14) NFS-PDI-DD11B-10.0-10.5 (JC27321-16) NFS-PDI-DD11B-11.0-11.5 (JC27321-17) NFS-PDI-DD11B-11.0-11.5X (JC27321-18) NFS-PDI-DD11B-13.0-13.5 (JC27321-19) NFS-PDI-DD11B-15.0-15.5 (JC27321-20) NFS-PDI-DD11B-17.0-17.5 (JC27321-21) NFS-PDI-DD11B-19.0-19.5 (JC27321-22) NFS-PDI-DD11B-20.0-20.5 (JC27321-23) NFS-PDI-DD11B-7.0-7.5 (JC27321-26) NFS-PDI-DD11B-9.0-9.5 (JC27321-27) NFS-PDI-DD11B-9.5-10.0 (JC27321-28) NFS-PDI-T15B-10.0-10.5 (JC27321-30) NFS-PDI-T15B-12.0-12.5 (JC27321-31) NFS-PDI-T15B-14.0-14.5 (JC27321-32) NFS-PDI-T15B-4.0-4.5 (JC27321-36) NFS-PDI-T15B-6.0-6.5 (JC27321-37) NFS-PDI-T15B-6.0-6.5X (JC27321-38) NFS-PDI-T15B-8.0-8.5 (JC27321-39) NFS-PDI-U15B-10.0-10.5 (JC27321-41) NFS-PDI-U15B-12.0-12.5 (JC27321-42) NFS-PDI-U15B-14.0-14.5 (JC27321-43) NFS-PDI-U15B-2.0-2.5 (JC27321-44) NFS-PDI-U15B-4.0-4.5 (JC27321-45) NFS-PDI-U15B-6.0-6.5 (JC27321-46) NFS-PDI-U15B-8.0-8.5 (JC27321-47) NFS-PDI-W16B-3.0-3.5 (JC27321-50) NFS-PDI-W16B-5.0-5.5 (JC27321-51) NFS-PDI-W16B-7.0-7.5 (JC27321-52) NFS-PDI-W16B-8.0-8.5 (JC27321-53) NFS-PDI-X16B-10.0-10.5 (JC27321-54) NFS-PDI-X16B-12.0-12.5 (JC27321-55)	NFS-PDI-W16B-0.2-0.7 (JC27321-48) NFS-PDI-W16B-1.0-1.5 (JC27321-49)

Spiked Sample	Samples Associated by Matrix	Samples Associated by Batch
NFS-PDI-X16B-8.0-8.5 (JC27321-57)	NFS-PDI-T15B-16.0-16.5 (JC27321-33) NFS-PDI-T15B-18.0-18.5 (JC27321-34) NFS-PDI-X16B-6.0-6.5 (JC27321-56) NFS-PDI-X16B-8.0-8.5 (JC27321-57)	

MS sample NFS-PDI-CC12B-6.0-6.5 (JC27321-12)

Sample NFS-PDI-CC12B-6.0-6.5, associated with samples as noted above, was selected for the soil matrix spike analysis and used for supporting data quality recommendations. The soluble and insoluble MS recoveries from the initial batch were 69.2% and 96.1%, respectively. The soluble MS recovery did not meet quality control (QC) criteria of 75-125%R. The post digestion spike (PDS) recovery was 93.8%, which met the PDS criteria of 85-115%.

Based on the soluble MS recovery less than 75%R, the MS and associated samples were reanalyzed using Method 7196. The soluble and insoluble matrix spike recoveries from the re-analysis were 63.3% and 90.1%, respectively. The soluble MS recovery did not meet the QC criteria of 75-125%R. The post spike result for the re-analysis batch was recovered at 93.27%, which met the PDS criteria of 85-115%.

Since the soluble and/or insoluble MS recoveries were outside the acceptable QC limit of 75-125%, additional parameters were analyzed to determine if possible matrix interferences could be the cause for the poor matrix spike recoveries. All the soil samples were tested for pH and oxidation reduction potential (ORP) and plotted on an Eh/pH phase diagram chart. From this chart, the source sample for the matrix spike analysis was plotted below the phase change line, indicating reducing potential within the sample matrix, incapable of supporting hexavalent chromium. Analyses for ferrous iron, sulfide screen, and total organic carbon (TOC) were performed on the MS source sample to confirm the oxidizing/reducing potential within the sample matrix. The sulfide screen was reported as nondetect, indicating no reducing agents within the sample matrix; however, the ferrous iron (1.3 %) and the TOC results (744 mg/Kg) were positive, indicating potential reducing agents within the sample matrix.

Since the soluble MS recoveries from both the initial and reanalysis did not meet the MS QC requirements, but at least one MS recovery was greater than 50%, the highest detected hexavalent chromium result or the nondetect hexavalent chromium result with the lowest reporting limit (RL) was reported for each soil sample. The reported hexavalent chromium results in the associated soil samples were qualified as estimated (J) due to the low soluble MS recoveries.

MS sample NFS-PDI-T15B-6.0-6.5 (JC27321-37)

Sample NFS-PDI-T15B-6.0-6.5, associated with samples as noted above, was selected for the soil MS analysis and used for supporting data quality recommendations. The soluble and insoluble MS recoveries from the initial batch were 79.6% and 101.1%, respectively; which met the quality control criteria of 75-125%. The PDS recovery was 90.8%, which met the PDS criteria of 85-115%. No data qualification was required on the basis of spike recoveries.

MS sample NFS-PDI-X16B-8.0-8.5 (JC27321-57)

Sample NFS-PDI-X16B-8.0-8.5, associated with samples as noted above, was selected for the soil matrix spike analysis and used for supporting data quality recommendations. The soluble and insoluble MS recoveries from the initial batch were 74.4% and 85.4%, respectively. The soluble MS recovery did not meet QC criteria of 75-125%R. The PDS recovery was 98.08%, which met the PDS criteria of 85-115%.

Based on the soluble MS recovery, less than 75%R, the MS and associated samples were reanalyzed using Method 7196. The soluble and insoluble matrix spike recoveries from the re-analysis were 87.5% and 98.0%, respectively; which met the quality control criteria of 75-125%. The post spike result for the re-analysis batch was recovered at 95.9%, which met the PDS criteria of 85-115%. Based on professional judgment no qualification was applied to these results based on MS recoveries.

Laboratory Duplicate Precision

There were three sets of laboratory duplicates, NFS-PDI-CC12B-6.0-6.5 (JC27321-12,-12R), NFS-PDI-T15B-6.0-6.5 (JC27321-37) and NFS-PDI-X16B-8.0-8.5 (JC27321-57,-57T), that were selected by the laboratory to demonstrate laboratory precision capabilities.

The relative percent difference for hexavalent chromium in sample NFS-PDI-CC12B-6.0-6.5, associated with samples JC27321-2 through JC27321-21, exceeded the QC acceptance RPD in the reanalysis; therefore, the hexavalent chromium results in the associated soil samples reported from the reanalysis were qualified as estimated (J).

All QC criteria were met for sample NFS-PDI-T15B-6.0-6.5, associated with samples JC27321-22 through JC27321-41. No qualifications were made.

Both the sample and duplicate results were less than 4 times the RL and the absolute difference was less than the RL for sample NFS-PDI-X16B-8.0-8.5, associated with samples JC27321-42 through JC27321-57. No qualifications were made.

Field Duplicate Results

Three field duplicate pairs, NFS-PDI-CC12B-4.0-4.5 (JC27321-10R) & NFS-PDI-CC12B-4.0-4.5X (JC27321-11R), NFS-PDI-DD11B-11.0-11.5 (JC27321-17R) & NFS-PDI-DD11B-11.0-11.5X (JC27321-18) and NFS-PDI-T15B-6.0-6.5 (JC27321-37) & NFS-PDI-T15B-6.0-6.5X (JC27321-38), are associated with the samples in this SDG and were used for supporting data quality recommendations. Field duplicate samples are associated with field samples using matrix similarities as the primary criteria, then by analytical preparation batch when no matrix match is possible. The following table summarizes each of the field duplicate samples and field samples associated with each, differentiating between those associated by matrix, and those associated by batch.

Field Duplicate Sample	Samples Associated for Matrix	Samples Associated by Batch
NFS-PDI-CC12B-4.0-4.5/ NFS-PDI-CC12B-4.0-4.5X (JC27321-10R/11R)	NFS-PDI-CC12B-4.0-4.5 (JC27321-10) NFS-PDI-CC12B-4.0-4.5 X (JC27321-11) NFS-PDI-CC12B-6.0-6.5 (JC27321-12) NFS-PDI-CC12B-8.0-8.5 (JC27321-13) NFS-PDI-DD11B-3.0-3.5 (JC27321-24) NFS-PDI-DD11B-5.0-5.5 (JC27321-25) NFS-PDI-T15B-0.5-1.0 (JC27321-29) NFS-PDI-T15B-2.0-2.5 (JC27321-35) NFS-PDI-U15B-0.3-0.8 (JC27321-40) NFS-PDI-U15B-2.0-2.5 (JC27321-44) NFS-PDI-U15B-4.0-4.5 (JC27321-45)	NFS-PDI-CC12B-0.0-0.5 (JC27321-2) NFS-PDI-CC12B-2.0-2.5 (JC27321-8) NFS-PDI-DD11B-1.0-1.5 (JC27321-15)
NFS-PDI-DD11B-11.0-11.5/ NFS-PDI-DD11B-11.0-11.5X	NFS-PDI-CC12B-10.0-10.5 (JC27321-3) NFS-PDI-CC12B-12.0-12.5 (JC27321-4) NFS-PDI-CC12B-14.0-14.5 (JC27321-5) NFS-PDI-CC12B-16.0-16.5 (JC27321-6)	

(JC27321-17R/18)	NFS-PDI-CC12B-18.0-18.5 (JC27321-7) NFS-PDI-CC12B-20.0-20.5 (JC27321-9) NFS-PDI-CC12B-8.5-9.0 (JC27321-14) NFS-PDI-DD11B-10.0-10.5 (JC27321-16) NFS-PDI-DD11B-11.0-11.5 (JC27321-17) NFS-PDI-DD11B-11.0-11.5X (JC27321-18) NFS-PDI-DD11B-13.0-13.5 (JC27321-19) NFS-PDI-DD11B-15.0-15.5 (JC27321-20) NFS-PDI-DD11B-17.0-17.5 (JC27321-21) NFS-PDI-DD11B-19.0-19.5 (JC27321-22) NFS-PDI-DD11B-20.0-20.5 (JC27321-23)	
NFS-PDI-T15B-6.0-6.5 /NFS-PDI-T15B-6.0-6.5X (JC27321-37/38)	NFS-PDI-DD11B-7.0-7.5 (JC27321-26) NFS-PDI-DD11B-9.0-9.5 (JC27321-27) NFS-PDI-DD11B-9.5-10.0 (JC27321-28) NFS-PDI-T15B-4.0-4.5 (JC27321-36) NFS-PDI-T15B-6.0-6.5 (JC27321-37) NFS-PDI-T15B-6.0-6.5X (JC27321-38) NFS-PDI-T15B-8.0-8.5 (JC27321-39) NFS-PDI-U15B-10.0-10.5 (JC27321-41) NFS-PDI-U15B-12.0-12.5 (JC27321-42) NFS-PDI-U15B-14.0-14.5 (JC27321-43) NFS-PDI-U15B-6.0-6.5 (JC27321-46) NFS-PDI-U15B-8.0-8.5 (JC27321-47) NFS-PDI-W16B-3.0-3.5 (JC27321-50) NFS-PDI-W16B-5.0-5.5 (JC27321-51) NFS-PDI-W16B-7.0-7.5 (JC27321-52) NFS-PDI-W16B-8.0-8.5 (JC27321-53) NFS-PDI-X16B-10.0-10.5 (JC27321-54) NFS-PDI-X16B-12.0-12.5 (JC27321-55) NFS-PDI-X16B-6.0-6.5 (JC27321-56) NFS-PDI-X16B-8.0-8.5 (JC27321-57)	NFS-PDI-T15B-10.0-10.5 (JC27321-30) NFS-PDI-T15B-12.0-12.5 (JC27321-31) NFS-PDI-T15B-14.0-14.5 (JC27321-32) NFS-PDI-T15B-16.0-16.5 (JC27321-33) NFS-PDI-T15B-18.0-18.5 (JC27321-34) NFS-PDI-W16B-0.2-0.7 (JC27321-48) NFS-PDI-W16B-1.0-1.5 (JC27321-49)

The field duplicate pairs NFS-PDI-CC12B-4.0-4.5 (JC27321-10R) & NFS-PDI-CC12B-4.0-4.5X (JC27321-11R) and NFS-PDI-DD11B-11.0-11.5 (JC27321-17R) & NFS-PDI-DD11B-11.0-11.5X (JC27321-18), associated with samples as noted above, reported results that were less than 4 times the RL. The absolute difference was less than the RL; therefore, no qualifications were made.

The relative percent difference for the reported hexavalent chromium field duplicate results in the field duplicate pair NFS-PDI-T15B-6.0-6.5 (JC27321-37) & NFS-PDI-T15B-6.0-6.5X (JC27321-38), associated with samples as noted above, exceeded the QC acceptance RPD; therefore, the reported hexavalent chromium results in the associated soil samples were qualified as estimated (J).

Sample Results

Reported results (flagged B by the laboratory) that were less than the reporting limit (RL), but greater than or equal to the method detection limit (MDL) are approximate values and have been qualified as estimated (J).

Sample NFS-PDI-U15B-4.0-4.5 (JC27321-45,-45T) had results that significantly differed between the initial analysis and reanalysis, such that one result exceeded the project action limit of 20 mg/kg. The

highest detected hexavalent chromium result between the initial analysis and reanalysis was reported for each sample in this SDG.

Data Quality and Usability

In general, these data appear to be valid and may be used for decision-making purposes. No data were rejected. Qualified results, if applicable, are presented in Attachments A and B.

The hexavalent chromium soil results in this SDG are usable as estimated values with the potential for low bias due to low soluble MS recovery, and since the MS sample matrix appears to be reducing based on the Eh-pH plot and the presence of TOC and ferrous iron.

Sample results qualified due to poor laboratory duplicate precision and or field duplicate precision, are usable as estimated values with an unknown directional bias.

Sample NFS-PDI-U15B-4.0-4.5 (JC27321-45, -45T) had results that significantly differed between the initial analysis and reanalysis, such that one result exceeded the project action limit of 20 mg/kg. The highest detected hexavalent chromium result between the initial analysis and reanalysis was reported for each sample in this SDG.

Sample results reported between the MDL and RL are usable as estimated values with an unknown directional bias.

ATTACHMENTS

Attachment A: Target Analyte Summary Hitlist(s)

Attachment B: Data Validation Report Form

Attachment A

Target Analyte Summary Hitlist(s)

Soil Target Analyte Summary Hit List (Hexavalent Chromium)

Site Name PPG - North Forest Street PDI
Sampling Date September 2, 2016 and September 9, 2016
Lab Name/ID SGS/Accutest, Dayton, NJ
SDG No JC27321, JC27321R and JC27321T
Sample Matrix Soil
Trip Blank ID NA
Field Blank ID NFS-FB20160909

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
NFS-PDI-CC12B-0.0-0.5	JC27321-2	CHROMIUM (HEXAVALENT)	U	9.3	9.3	0.49	Qualify	1
NFS-PDI-CC12B-10.0-10.5	JC27321-3R	CHROMIUM (HEXAVALENT)	U	1.8	1.8	0.44	Qualify	2
NFS-PDI-CC12B-12.0-12.5	JC27321-4	CHROMIUM (HEXAVALENT)	U	1.3	1.3	0.45		
NFS-PDI-CC12B-14.0-14.5	JC27321-5	CHROMIUM (HEXAVALENT)	U	5.1	5.1	0.48		
NFS-PDI-CC12B-16.0-16.5	JC27321-6R	CHROMIUM (HEXAVALENT)	U	2.8	2.8	0.47	Qualify	2
NFS-PDI-CC12B-18.0-18.5	JC27321-7R	CHROMIUM (HEXAVALENT)	U	5.9	5.9	0.45	Qualify	2
NFS-PDI-CC12B-2.0-2.5	JC27321-8	CHROMIUM (HEXAVALENT)	U	6.6	6.6	0.47	Qualify	1
NFS-PDI-CC12B-20.0-20.5	JC27321-9R	CHROMIUM (HEXAVALENT)	U	39.6	39.6	0.48	Qualify	2
NFS-PDI-CC12B-4.0-4.5	JC27321-10R	CHROMIUM (HEXAVALENT)	U	1.1	1.1	0.52	Qualify	1,2
NFS-PDI-CC12B-4.0-4.5X	JC27321-11R	CHROMIUM (HEXAVALENT)	U	1.4	1.4	0.52	Qualify	1,2
NFS-PDI-CC12B-6.0-6.5	JC27321-12R	CHROMIUM (HEXAVALENT)	U	7.6	7.6	0.51	Qualify	1,2
NFS-PDI-CC12B-8.0-8.5	JC27321-13	CHROMIUM (HEXAVALENT)	U	85.3	85.3	2.4		
NFS-PDI-CC12B-8.5-9.0	JC27321-14	CHROMIUM (HEXAVALENT)	U	15.6	15.6	0.48		
NFS-PDI-DD11B-1.0-1.5	JC27321-15R	CHROMIUM (HEXAVALENT)	U	1.4	1.4	0.47	Qualify	1,2
NFS-PDI-DD11B-11.0-11.5	JC27321-17R	CHROMIUM (HEXAVALENT)	U	1.1	1.1	0.50	Qualify	2
NFS-PDI-DD11B-11.0-11.5X	JC27321-18	CHROMIUM (HEXAVALENT)	U	0.70	0.70	0.51		
NFS-PDI-DD11B-13.0-13.5	JC27321-19R	CHROMIUM (HEXAVALENT)	U	13.3	13.3	0.50	Qualify	2
NFS-PDI-DD11B-15.0-15.5	JC27321-20	CHROMIUM (HEXAVALENT)	U	13.6	13.6	0.48		

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
NFS-PDI-DD11B-17.0-17.5	JC27321-21	CHROMIUM (HEXAVALENT)	U	6.4	6.4	0.47		
NFS-PDI-DD11B-19.0-19.5	JC27321-22	CHROMIUM (HEXAVALENT)	U	13.3	13.3	0.50		
NFS-PDI-DD11B-20.0-20.5	JC27321-23	CHROMIUM (HEXAVALENT)	U	14.3	14.3	0.49		
NFS-PDI-DD11B-3.0-3.5	JC27321-24	CHROMIUM (HEXAVALENT)	U	0.92	0.92	0.54	Qualify	1
NFS-PDI-DD11B-5.0-5.5	JC27321-25	CHROMIUM (HEXAVALENT)	U	1.2	1.2	0.51	Qualify	1
NFS-PDI-DD11B-7.0-7.5	JC27321-26	CHROMIUM (HEXAVALENT)	U	0.38B	0.38	0.52	Qualify	3,4
NFS-PDI-DD11B-9.0-9.5	JC27321-27	CHROMIUM (HEXAVALENT)	U	0.64	0.64	0.52	Qualify	3
NFS-PDI-DD11B-9.5-10.0	JC27321-28	CHROMIUM (HEXAVALENT)	U	0.63	0.63	0.49	Qualify	3
NFS-PDI-T15B-0.5-1.0	JC27321-29	CHROMIUM (HEXAVALENT)	U	5.6	5.6	0.41	Qualify	1
NFS-PDI-T15B-10.0-10.5	JC27321-30	CHROMIUM (HEXAVALENT)	U	4.6	4.6	0.46	Qualify	3
NFS-PDI-T15B-12.0-12.5	JC27321-31	CHROMIUM (HEXAVALENT)	U	2.7	2.7	0.44	Qualify	3
NFS-PDI-T15B-14.0-14.5	JC27321-32	CHROMIUM (HEXAVALENT)	U	1.9	1.9	0.45	Qualify	3
NFS-PDI-T15B-16.0-16.5	JC27321-33	CHROMIUM (HEXAVALENT)	U	11.3	11.3	0.45	Qualify	3
NFS-PDI-T15B-18.0-18.5	JC27321-34	CHROMIUM (HEXAVALENT)	U	18.3	18.3	0.45	Qualify	3
NFS-PDI-T15B-2.0-2.5	JC27321-35	CHROMIUM (HEXAVALENT)	U	6.8	6.8	0.43	Qualify	1
NFS-PDI-T15B-4.0-4.5	JC27321-36	CHROMIUM (HEXAVALENT)	U	44.7	44.7	0.48	Qualify	3
NFS-PDI-T15B-6.0-6.5	JC27321-37	CHROMIUM (HEXAVALENT)	U	1.7	1.7	0.45	Qualify	3
NFS-PDI-T15B-6.0-6.5X	JC27321-38	CHROMIUM (HEXAVALENT)	U	2.8	2.8	0.45	Qualify	3
NFS-PDI-T15B-8.0-8.5	JC27321-39	CHROMIUM (HEXAVALENT)	U	3.3	3.3	0.45	Qualify	3
NFS-PDI-U15B-0.3-0.8	JC27321-40	CHROMIUM (HEXAVALENT)	U	1.2	1.2	0.42	Qualify	1
NFS-PDI-U15B-10.0-10.5	JC27321-41	CHROMIUM (HEXAVALENT)	U	0.99	0.99	0.45	Qualify	3
NFS-PDI-U15B-12.0-12.5	JC27321-42T	CHROMIUM (HEXAVALENT)	U	1.4	1.4	0.45	Qualify	3
NFS-PDI-U15B-14.0-14.5	JC27321-43	CHROMIUM (HEXAVALENT)	U	2.2	2.2	0.45	Qualify	3
NFS-PDI-U15B-2.0-2.5	JC27321-44	CHROMIUM (HEXAVALENT)	U	1.3	1.3	0.45		
NFS-PDI-U15B-4.0-4.5	JC27321-45T	CHROMIUM (HEXAVALENT)	U	28.8	28.8	0.45		

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
NFS-PDI-U15B-6.0-6.5	JC27321-46T	CHROMIUM (HEXAVALENT)	U	8.0	8.0	0.45	Qualify	3
NFS-PDI-U15B-8.0-8.5	JC27321-47T	CHROMIUM (HEXAVALENT)	U	15.1	15.1	0.45	Qualify	3
NFS-PDI-W16B-0.2-0.7	JC27321-48	CHROMIUM (HEXAVALENT)	U	1.4	1.4	0.41	Qualify	3
NFS-PDI-W16B-1.0-1.5	JC27321-49T	CHROMIUM (HEXAVALENT)	U	2.7	2.7	0.42	Qualify	3
NFS-PDI-W16B-3.0-3.5	JC27321-50T	CHROMIUM (HEXAVALENT)	U	5.6	5.6	0.43	Qualify	3
NFS-PDI-W16B-5.0-5.5	JC27321-51	CHROMIUM (HEXAVALENT)	U	1.1	1.1	0.42	Qualify	3
NFS-PDI-W16B-7.0-7.5	JC27321-52T	CHROMIUM (HEXAVALENT)	U	1.1	1.1	0.42	Qualify	3
NFS-PDI-W16B-8.0-8.5	JC27321-53T	CHROMIUM (HEXAVALENT)	U	0.84	0.84	0.43	Qualify	3
NFS-PDI-X16B-10.0-10.5	JC27321-54	CHROMIUM (HEXAVALENT)	U	6.9	6.9	0.49	Qualify	3
NFS-PDI-X16B-12.0-12.5	JC27321-55T	CHROMIUM (HEXAVALENT)	U	4.4	4.4	0.47	Qualify	3
NFS-PDI-X16B-6.0-6.5	JC27321-56T	CHROMIUM (HEXAVALENT)	U	0.38B	0.38	0.45	Qualify	3,4
NFS-PDI-X16B-8.0-8.5	JC27321-57	CHROMIUM (HEXAVALENT)	U	0.65	0.65	0.45	Qualify	3

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

NJDEP Laboratory Footnote

1. The reported value was qualified because the soluble and/or insoluble matrix recoveries were less than 75%, but greater than 50%.
2. In the Duplicate Sample Analysis, Hexavalent Chromium fell outside the control limits of + 20 percent for sample results > 4xRL or + RL for sample results < 4xRL. Therefore, the result was qualified.
3. In the Field Duplicate Sample Analysis, Hexavalent Chromium fell outside the control limits of ≤20% for sample results > 4xRL or + RL for sample results < 4xRL. Therefore, the result was qualified.
4. The reported result was greater than the MDL but less than the RL and therefore was estimated.

Attachment B

Data Validation Report Form

Client Name: PPG Industries		Project Number: 60314351.GA.DE.PDI.NFS			
Site Location: PPG - North Forest Street PDI, Jersey City, NJ		Project Manager: Aimee Ruiter			
Laboratory: SGS/Accutest, Dayton, NJ		Type of Validation: Full			
Laboratory Job No: JC27321, JC27321R and JC27321T		Date Checked: 10/05/2016			
Validator: Charlene Livingston Flint		Peer: Mary Kozik			
ITEM	YES	NO	N/A	COMMENTS	
Sample results included?	X				
Reporting Limits met project requirements?	X				
Field I.D. included?	X				
Laboratory I.D. included?	X				
Did data package sample IDs match sample IDs on COC?	X				
Did electronic data deliverable (EDD) sample IDs match COC sample IDs?	X				
Did data package sample IDs match electronic data deliverable (EDD) sample IDs?	X				
Sample matrix included?	X				
Sample receipt temperature 2-6°C?	X			5.4° C	
Signed COCs included?	X				
Date of sample collection included?	X				
Date of sample digestion included?	X				
Holding time to digestion met criteria? (Soils -30 days from collection to digestion.)	X				
Date of analysis included?	X				
Holding time to analysis met criteria? (Soils -168 hours from digestion to analysis; Aqueous - 24 hours from collection to analysis.)	X				
Method reference included?	X				
Laboratory Case Narrative included?	X				
Definitions: MDL - Method Detection Limit; %R - Percent Recovery; RL - Reporting Limit; RPD - Relative Percent Difference; RSD - Relative Standard Deviation :Corr - Correlation Coefficient.					

ITEM	YES	NO	N/A	COMMENTS
Initial calibration documentation included in lab package?	X			
1) Blank plus 4 standards (7196A) or blank plus 3 standards (7199)	X			
2) Correlation coefficient of =0.995 (7196A) or =0.999 (7199)	X			
3) Calibrate daily or each time instrument is set up.	X			
Calibration Check Standard (CCS) for 7196A and Quality Control Sample (QCS) for 7199 Included in Lab Package?	X			
1) %R criteria met? (90 - 110%)	X			
2) Correct frequency of one per every 10 samples	X			
3) CCS and QCS from independent source and at mid- level of calibration curve	X			
Calibration Blanks	X			
1) Analyzed prior to initial calibration standards and after each CCS/QCS?	X			
2) Absolute value should not exceed MDL.	X			
Method Blank, Field Blanks and/or Equipment Blanks Included in Lab Package?	X			
1) Method blank analyzed with each preparation batch?	X			
2) Absolute value should not exceed MDL.	X			
Eh and pH Data	X			
1) Eh and pH data was included and plotted for all samples?	X			
Soluble Matrix Spike Data Included in Lab Package?	X			3 sets. JC27321-12,-12R, JC27321-37 and JC27321-57, -57T
1) Soluble Matrix %R criteria met? (75-125%R).		X		See nonconformance tables.
2) Was the spike concentration 40 mg/Kg or twice the sample concentration?	X			Spiked at 52.1, 52.8, 45.1, 45.4 and 44.7 mg/kg.
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	X			
Insoluble Matrix Spike Data Included in Lab Package?	X			
1) Insoluble Matrix %R criteria met? (75-125%R).	X			
2) Was the spike concentration around 400 to 800 mg/Kg?		X		Spiked at 1140, 1010, 1050, 945 and 1000 mg/kg. No impact on data.
3) Was a sample spiked at the frequency of 1 per batch or 20	X			

samples?				
Post Digestion Spike	X			
1) Post Digestion Spike %R criteria met? (85-115%R).	X			
2) Was the spike concentration 40 mg/Kg or twice the sample concentration?	X			
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	X			
Sample Duplicate Data Included in Lab Package?	X			3 sets. JC27321-12,-12R, JC27321-37 and JC27321-57, -57T
1) RPD criteria met? (RPD < 20%) if both results are $\geq 4x$ RL or control limit of \pm RL if both results are $< 4xRL$.		X		See nonconformance tables.
2) Was a sample duplicate analyzed at the frequency of 1 per batch or 20 samples?	X			
Was a Laboratory Control Sample (LCS) Included in Lab Package?	X			
1) %R criteria met? (80-120%R).	X			
2) Was an LCS analyzed at the frequency of 1/batch or 20 samples?	X			
Were any Field Duplicate samples submitted with this SDG?	X			3 sets. JC27321-10R & -11R and JC27321-17R & -18, JC27321-37 & -38.
1) RPD criteria met? (RPD < 20%) if both results are $\geq 4x$ RL or control limit of \pm RL if both results are $< 4xRL$.		X		See nonconformance tables.
Were all sample quantitation and reporting requirements met?	X			
1) Were all solid samples reported with percent solids > 50%?	X			
2) Were any samples analyzed or reported with dilutions?	X			Sample JC27321-13 diluted 5x.
Miscellaneous Items	X			
1) For soils by 7196A, was the pH within a range of 7.0-8.0?	X			
2) For soils by 7199, was the pH within a range of 9.0-9.5?			X	
3) For aqueous by 7196A, was the pH with a range of 1.5-2.5?	X			
4) For soils (3060A), was the digestion temperature 90-95C for at least 60 minutes?	X			
5) For 7199, was each sample injected twice and was the RPD ≤ 20 ?			X	

Matrix Spikes

Sample ID	Lab ID	Analyte	Matrix Spike	% Recovery	Lower Limit	Upper Limit	PDS%	PDS Limit %
NFS-PDI-CC12B-6.0-6.5	JC27321-12	CHROMIUM (HEXAVALENT)	Soluble	69.2	75	125	93.8	85-115
NFS-PDI-CC12B-6.0-6.5	JC27321-12	CHROMIUM (HEXAVALENT)	Insoluble	96.1	75	125		
NFS-PDI-CC12B-6.0-6.5	JC27321-12R	CHROMIUM (HEXAVALENT)	Soluble	63.3	75	125	93.27	85-115
NFS-PDI-CC12B-6.0-6.5	JC27321-12R	CHROMIUM (HEXAVALENT)	Insoluble	90.1	75	125		
NFS-PDI-X16B-8.0-8.5	JC27321-57T	CHROMIUM (HEXAVALENT)	Soluble	87.5	75	125	95.9	85-115
NFS-PDI-X16B-8.0-8.5	JC27321-57T	CHROMIUM (HEXAVALENT)	Insoluble	98.0	75	125		
NFS-PDI-X16B-8.0-8.5	JC27321-57	CHROMIUM (HEXAVALENT)	Soluble	74.4	75	125	98.08	85-115
NFS-PDI-X16B-8.0-8.5	JC27321-57	CHROMIUM (HEXAVALENT)	Insoluble	85.4	75	125		
NFS-PDI-T15B-6.0-6.5	JC27321-37	CHROMIUM (HEXAVALENT)	Soluble	79.6	75	125	90.8	85-115
NFS-PDI-T15B-6.0-6.5	JC27321-37	CHROMIUM (HEXAVALENT)	Insoluble	101.1	75	125		

Lab Duplicates

Sample ID	Lab ID	Analyte	Sample Result	Qual	Duplicate Result	Qual	QL	Units	RPD	Action
NFS-PDI-X16B-8.0-8.5	JC27321-57	CHROMIUM (HEXAVALENT)	0.65		0.55		0.45	mg/kg	16.7	OK
NFS-PDI-CC12B-6.0-6.5	JC27321-12R	CHROMIUM (HEXAVALENT)	7.6		1.4		0.51	mg/kg	137.8	SR>4xRL, Abs Diff>RL, Estimate (J)
NFS-PDI-CC12B-6.0-6.5	JC27321-12	CHROMIUM (HEXAVALENT)	3.0		3.1		0.51	mg/kg	3.3	OK
NFS-PDI-X16B-8.0-8.5	JC27321-57T	CHROMIUM (HEXAVALENT)	0.62		0.85		0.45	mg/kg	31.3	SR<4xRL, Abs Diff<RL, Accept
NFS-PDI-T15B-6.0-6.5	JC27321-37	CHROMIUM (HEXAVALENT)	1.7		1.7		0.45	mg/kg	0	OK

Field Duplicates

Sample ID	Duplicate ID	Lab ID	Analyte	Sample Result	Qual	Duplicate Result	Qual	QL	Units	RPD	Action
NFS-PDI-CC12B-4.0-4.5	NFS-PDI-CC12B-4.0-4.5X	JC27321-10R/11R	CHROMIUM (HEXAVALENT)	1.1		1.4		0.52	mg/kg	24.0	SR<4xRL, Abs Diff<RL, Accept
NFS-PDI-DD11B-11.0-11.5	NFS-PDI-DD11B-11.0-11.5X	JC27321-17R/18R	CHROMIUM (HEXAVALENT)	1.1		0.70		0.50	mg/kg	44.4	SR<4xRL, Abs Diff<RL, Accept
NFS-PDI-T15B-6.0-6.5	NFS-PDI-T15B-6.0-6.5X	JC27321-37/38	CHROMIUM (HEXAVALENT)	1.7		2.8		0.45	mg/kg	48.9	SR>4xRL, Abs Diff>RL, Estimate (J)

Percent Solids

Sample ID	Percent Solids (%)	Status
NFS-PDI-CC12B-0.0-0.5	82	ok @50%
NFS-PDI-CC12B-10.0-10.5	90.6	ok @50%
NFS-PDI-CC12B-12.0-12.5	89.7	ok @50%
NFS-PDI-CC12B-14.0-14.5	84	ok @50%
NFS-PDI-CC12B-16.0-16.5	85.5	ok @50%
NFS-PDI-CC12B-18.0-18.5	88.8	ok @50%
NFS-PDI-CC12B-2.0-2.5	84.7	ok @50%
NFS-PDI-CC12B-20.0-20.5	82.9	ok @50%
NFS-PDI-CC12B-4.0-4.5	77.6	ok @50%
NFS-PDI-CC12B-4.0-4.5X	77.6	ok @50%
NFS-PDI-CC12B-6.0-6.5	78.6	ok @50%
NFS-PDI-CC12B-8.0-8.5	82.2	ok @50%

Sample ID	Percent Solids (%)	Status
NFS-PDI-CC12B-8.5-9.0	83.5	ok @50%
NFS-PDI-DD11B-1.0-1.5	85.1	ok @50%
NFS-PDI-DD11B-10.0-10.5	76.9	ok @50%
NFS-PDI-DD11B-11.0-11.5	79.7	ok @50%
NFS-PDI-DD11B-11.0-11.5X	78.9	ok @50%
NFS-PDI-DD11B-13.0-13.5	80.8	ok @50%
NFS-PDI-DD11B-15.0-15.5	82.9	ok @50%
NFS-PDI-DD11B-17.0-17.5	84.9	ok @50%
NFS-PDI-DD11B-19.0-19.5	80.5	ok @50%
NFS-PDI-DD11B-20.0-20.5	81.3	ok @50%
NFS-PDI-DD11B-3.0-3.5	73.4	ok @50%
NFS-PDI-DD11B-5.0-5.5	79.1	ok @50%
NFS-PDI-DD11B-7.0-7.5	77.4	ok @50%
NFS-PDI-DD11B-9.0-9.5	76.5	ok @50%
NFS-PDI-DD11B-9.5-10.0	82.4	ok @50%
NFS-PDI-T15B-0.5-1.0	96.5	ok @50%
NFS-PDI-T15B-10.0-10.5	86.6	ok @50%
NFS-PDI-T15B-12.0-12.5	90.3	ok @50%
NFS-PDI-T15B-14.0-14.5	89.6	ok @50%
NFS-PDI-T15B-16.0-16.5	88.4	ok @50%
NFS-PDI-T15B-18.0-18.5	88.5	ok @50%
NFS-PDI-T15B-2.0-2.5	92.7	ok @50%
NFS-PDI-T15B-4.0-4.5	82.9	ok @50%
NFS-PDI-T15B-6.0-6.5	89.1	ok @50%
NFS-PDI-T15B-6.0-6.5X	88.5	ok @50%
NFS-PDI-T15B-8.0-8.5	88.1	ok @50%
NFS-PDI-U15B-0.3-0.8	96.1	ok @50%
NFS-PDI-U15B-10.0-10.5	89	ok @50%
NFS-PDI-U15B-12.0-12.5	89.3	ok @50%

Sample ID	Percent Solids (%)	Status
NFS-PDI-U15B-14.0-14.5	88.4	ok @50%
NFS-PDI-U15B-2.0-2.5	88	ok @50%
NFS-PDI-U15B-4.0-4.5	89.4	ok @50%
NFS-PDI-U15B-6.0-6.5	88.9	ok @50%
NFS-PDI-U15B-8.0-8.5	88.7	ok @50%
NFS-PDI-W16B-0.2-0.7	96.5	ok @50%
NFS-PDI-W16B-1.0-1.5	94.7	ok @50%
NFS-PDI-W16B-3.0-3.5	93	ok @50%
NFS-PDI-W16B-5.0-5.5	94.6	ok @50%
NFS-PDI-W16B-7.0-7.5	95.4	ok @50%
NFS-PDI-W16B-8.0-8.5	92.4	ok @50%
NFS-PDI-X16B-10.0-10.5	82	ok @50%
NFS-PDI-X16B-12.0-12.5	85.8	ok @50%
NFS-PDI-X16B-6.0-6.5	89.8	ok @50%
NFS-PDI-X16B-8.0-8.5	88.5	ok @50%

SDG#: JC27321/ Method 7196

Batch: GN52103

Cr+6 ICAL 9/16/16

Soil

(p. 172 of data pkg)

x - concentration	y - response
0	0.001
0.01	0.009
0.05	0.041
0.1	0.083
0.3	0.23
0.5	0.401
0.8	0.624
1	0.816

(p. 172 of data pkg)

AECOM Calculated Offset	-0.0011	OK	Reported Offset	-0.0011
AECOM Slope	0.8020	OK	Reported Slope	0.802
AECOM Calculated r	0.99954	OK	Reported r	0.99954

LCS calculation

GP122-B1

P. 130,172

Background Absorbance

0

Total absorbance

0.677

Total absorbance - background

0.677

Instrument Concentration

0.845

Sample weight (mg/kg)

0.0025

Final Volume (L)

0.1

Dilution Factor

1

AECOM Calculated LCS Result (mg/Kg)	33.8	OK	Reported Result (mg/Kg)	33.8
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%R = Found/True*100

GP122-B1

P. 130,172

True Value (mg/kg)

40

AECOM Calculated %R	84.5	OK	Reported %R	84.5
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MS calculation

GP122-S2

P. 132,134,172

JC27321-12

Background reading

0

Total absorbance

0.347

Total absorbance - background

0.347

Instrument Concentration

0.4340

Sample weight (mg/kg)

0.00251

Final Volume (L)

0.1

Percent solids

0.786

Dilution Factor

50

AECOM Calculated MS Result (mg/Kg)	1100	OK	Reported Result (mg/Kg)	1100
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%R = Found/True*100

GP122-S2

P. 132,134,172

JC27321-12

True Value (mg/kg)

1140

Native concentration (mg/Kg)

3

AECOM %R	96.2	OK, rounding	Reported %R	96.1
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Percent Solids	JC27321-12	P. 134	NFS-PDI-CC12B-6.0-6.5
Empty dish weight=		18.97	
Wet weight=		25.76	
Dry weight=		24.31	
AECOM %solids =	78.6	OK	Reported %solids= 78.6

Reporting Limit	JC27321-12	P. 32,134,172	NFS-PDI-CC12B-6.0-6.5
Low Standard		0.01	
Initial weight (mg/kg)		0.00252	
Final volume (L)		0.1	
Percent solids		0.786	
Dilution Factor		1	
Reporting Limit	0.50	OK, rounding	Reported RL (mg/Kg)= 0.51

Sample Calculations	JC27321-12	P. 32,134,172	NFS-PDI-CC12B-6.0-6.5
Background reading		0.001	
Total absorbance		0.047	
Total absorbance - background		0.046	
Instrument Response		0.059	
Sample weight (mg/kg)		0.00252	
Final Volume (L)		0.1	
Percent solids		0.786	
Dilution Factor		1	
AECOM Calculated Result (mg/Kg)	3.0	OK	Reported Result (mg/Kg) 3.0

Associated w/ samples JC27321-2 through JC27321-21

SDG#: JC27321/ Method 7196

Batch: GN52116

Cr+6 ICAL 9/16/16

Soil

(p. 182 of data pkg)

x - concentration	y - response
0	0.001
0.01	0.009
0.05	0.041
0.1	0.083
0.3	0.23
0.5	0.401
0.8	0.624
1	0.816

(p. 182 of data pkg)

AECOM Calculated Offset	-0.0011	OK	Reported Offset	-0.0011
AECOM Slope	0.8020	OK	Reported Slope	0.802
AECOM Calculated r	0.99954	OK	Reported r	0.99954

LCS calculation

GP123-B2

P. 130,182

Background Absorbance	0
Total absorbance	0.43
Total absorbance - background	0.43
Instrument Concentration	0.537
Sample weight (mg/kg)	0.0025
Final Volume (L)	0.1
Dilution Factor	50

AECOM Calculated LCS Result (mg/Kg)	1075	OK, rounding	Reported Result (mg/Kg)	1070
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%R = Found/True*100

GP123-B2

P. 130,182

True Value (mg/kg)	1222.8
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AECOM Calculated %R	87.9	OK, rounding	Reported %R	87.5
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MS calculation

GP85-S2

P. 132,138,182

JC27321-37

Background reading	0
Total absorbance	0.388
Total absorbance - background	0.388
Instrument Concentration	0.4851
Sample weight (mg/kg)	0.00257
Final Volume (L)	0.1
Percent solids	0.891
Dilution Factor	50

AECOM Calculated MS Result (mg/Kg)	1059	OK, rounding	Reported Result (mg/Kg)	1060
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%R = Found/True*100

GP85-S2

P. 132,138,182

JC27321-37

True Value (mg/kg)	1050
Native concentration (mg/Kg)	1.7

AECOM%R	101	OK	Reported %R	101
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Percent Solids	JC27321-37	P. 138	NFS-PDI-T15B-6.0-6.5
Empty dish weight=	21.75		
Wet weight=	31.56		
Dry weight=	30.49		
AECOM %solids =	89.1	OK	Reported %solids= 89.1

Reporting Limit	JC27321-37	P. 57,138,182	NFS-PDI-T15B-6.0-6.5
Low Standard	0.01		
Initial weight (mg/kg)	0.00253		
Final volume (L)	0.1		
Percent solids	0.891		
Dilution Factor	1		
Reporting Limit	0.44	OK, rounding	Reported RL (mg/Kg)= 0.45

Sample Calculations	JC27321-37	P. 57,138,182	NFS-PDI-T15B-6.0-6.5
Background reading	0.003		
Total absorbance	0.032		
Total absorbance - background	0.029		
Instrument Response	0.037		
Sample weight (mg/kg)	0.00253		
Final Volume (L)	0.1		
Percent solids	0.891		
Dilution Factor	1		
AECOM Calculated Result (mg/Kg)	1.7	OK	Reported Result (mg/Kg) 1.7

Associated w/ samples JC27321-22 through JC27321-41

SDG#: JC27321/ Method 7196

Batch: GN52165

Cr+6 ICAL 9/17/16

Soil

(p. 191 of data pkg)

x - concentration	y - response
0	0.001
0.01	0.01
0.05	0.039
0.1	0.08
0.3	0.233
0.5	0.389
0.8	0.628
1	0.796

(p. 191 of data pkg)

AECOM Calculated Offset	-0.0006	OK	Reported Offset	-0.0006
AECOM Slope	0.7902	OK	Reported Slope	0.7902
AECOM Calculated r	0.99992	OK	Reported r	0.99992

LCS calculation

GP124-B1

P. 130,191

Background Absorbance	0
Total absorbance	0.665
Total absorbance - background	0.665
Instrument Concentration	0.842
Sample weight (mg/kg)	0.0025
Final Volume (L)	0.1
Dilution Factor	1

AECOM Calculated LCS Result (mg/Kg)	33.7	OK	Reported Result (mg/Kg)	33.7
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%R = Found/True*100

GP124-B1

P. 130,191

True Value (mg/kg)	40
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AECOM Calculated %R	84.2	OK, rounding	Reported %R	84.3
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MS calculation

GP124-S2

P. 132,142,191

JC27321-57

Background reading	0
Total absorbance	0.282
Total absorbance - background	0.282
Instrument Concentration	0.3577
Sample weight (mg/kg)	0.0025
Final Volume (L)	0.1
Percent solids	0.885
Dilution Factor	50

AECOM Calculated MS Result (mg/Kg)	808	OK	Reported Result (mg/Kg)	808
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%R = Found/True*100

GP124-S2

P. 132,142,191

JC27321-57

True Value (mg/kg)	945
Native concentration (mg/Kg)	0.65

AECOM %R	85.5	OK, rounding	Reported %R	85.4
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Percent Solids	JC27321-57	P. 142	NFS-PDI-X16B-8.0-8.5
Empty dish weight=	20.22		
Wet weight=	29.56		
Dry weight=	28.49		
AECOM %solids =	88.5	OK	Reported %solids= 88.5

Reporting Limit	JC27321-57	P. 77,142,191	NFS-PDI-X16B-8.0-8.5
Low Standard	0.01		
Initial weight (mg/kg)	0.00256		
Final volume (L)	0.1		
Percent solids	0.885		
Dilution Factor	1		
Reporting Limit	0.44	OK, rounding	Reported RL (mg/Kg)= 0.45

Sample Calculations	JC27321-57	P. 77,142,191	NFS-PDI-X16B-8.0-8.5
Background reading	0.015		
Total absorbance	0.026		
Total absorbance - background	0.011		
Instrument Response	0.015		
Sample weight (mg/kg)	0.00256		
Final Volume (L)	0.1		
Percent solids	0.885		
Dilution Factor	1		
AECOM Calculated Result (mg/Kg)	0.65	OK	Reported Result (mg/Kg) 0.65

Associated w/ samples JC27321-42 through JC27321-57

SDG#: JC27321R/ Method 7196

Batch: GN52546

Cr+6 ICAL 9/26/16

Soil

(p. 78 of data pkg)

x - concentration	y - response
0	0
0.01	0.009
0.05	0.041
0.1	0.063
0.3	0.25
0.5	0.371
0.8	0.627
1	0.784

(p. 78 of data pkg)

AECOM Calculated Offset	-0.0020	OK	Reported Offset	-0.002
AECOM Slope	0.7829	OK	Reported Slope	0.7829
AECOM Calculated r	0.99933	OK	Reported r	0.99933

LCS calculation

GP331-B2

P. 64,78

Background Absorbance	0
Total absorbance	0.375
Total absorbance - background	0.375
Instrument Concentration	0.482
Sample weight (mg/kg)	0.0025
Final Volume (L)	0.1
Dilution Factor	50

AECOM Calculated LCS Result (mg/Kg)	963.0	OK	Reported Result (mg/Kg)	963.0
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%R = Found/True*100

GP331-B2

P. 64,78

True Value (mg/kg)	1190.6
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AECOM Calculated %R	80.9	OK	Reported %R	80.9
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MS calculation

GP331-S2

P. 66,71,78

JC27321-12R

Background reading	0
Total absorbance	0.275
Total absorbance - background	0.275
Instrument Concentration	0.3538
Sample weight (mg/kg)	0.00246
Final Volume (L)	0.1
Percent solids	0.786
Dilution Factor	50

AECOM Calculated MS Result (mg/Kg)	915	OK	Reported Result (mg/Kg)	915
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%R = Found/True*100

GP331-S2

P. 66,71,78

JC27321-12R

True Value (mg/kg)	1010
Native concentration (mg/Kg)	7.6

AECOM%R	90	OK	Reported %R	90
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Percent Solids	JC27321-12R	P. 71	NFS-PDI-CC12B-6.0-6.5
Empty dish weight=	18.97		
Wet weight=	25.76		
Dry weight=	24.31		
AECOM %solids =	78.6	OK	Reported %solids= 78.6

Reporting Limit	JC27321-12R	P. 20,71,78	NFS-PDI-CC12B-6.0-6.5
Low Standard	0.01		
Initial weight (mg/kg)	0.00257		
Final volume (L)	0.1		
Percent solids	0.786		
Dilution Factor	1		
Reporting Limit	0.50	OK, rounding	Reported RL (mg/Kg)= 0.51

Sample Calculations	JC27321-12R	P. 20,71,78	NFS-PDI-CC12B-6.0-6.5
Background reading	0.001		
Total absorbance	0.12		
Total absorbance - background	0.119		
Instrument Response	0.155		
Sample weight (mg/kg)	0.00257		
Final Volume (L)	0.1		
Percent solids	0.786		
Dilution Factor	1		
AECOM Calculated Result (mg/Kg)	7.6	OK	Reported Result (mg/Kg) 7.6

Associated w/samples JC27321-2R through JC27321-21R

SDG#: JC27321T/ Method 7196

Batch: GN52609

Cr+6 ICAL 9/27/16

Soil

(p. 77 of data pkg)

x - concentration	y - response
0	0
0.01	0.009
0.05	0.038
0.1	0.08
0.3	0.237
0.5	0.393
0.8	0.621
1	0.811

(p. 77 of data pkg)

AECOM Calculated Offset	-0.0017	OK	Reported Offset	-0.0017
AECOM Slope	0.7979	OK	Reported Slope	0.7979
AECOM Calculated r	0.99963	OK	Reported r	0.99963

LCS calculation

GP351-B1

P. 49,77

Background Absorbance

0

Total absorbance

0.697

Total absorbance - background

0.697

Instrument Concentration

0.876

Sample weight (mg/kg)

0.0025

Final Volume (L)

0.1

Dilution Factor

1

AECOM Calculated LCS Result (mg/Kg)	35.0	OK	Reported Result (mg/Kg)	35.0
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%R = Found/True*100

GP351-B1

P. 49,77

True Value (mg/kg)

40

AECOM Calculated %R	87.6	OK, rounding	Reported %R	87.5
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MS calculation

GP351-S2

P. 51,57,77

JC27321-57T

Background reading

0

Total absorbance

0.341

Total absorbance - background

0.341

Instrument Concentration

0.4294

Sample weight (mg/kg)

0.00247

Final Volume (L)

0.1

Percent solids

0.885

Dilution Factor

50

AECOM Calculated MS Result (mg/Kg)	982	OK	Reported Result (mg/Kg)	982
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%R = Found/True*100

GP351-S2

P. 51,57,77

JC27321-57T

True Value (mg/kg)

1000

Native concentration (mg/Kg)

0.62

AECOM%R	98.2	OK, rounding	Reported %R	98.0
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Percent Solids	JC27321-57T	P. 57	NFS-PDI-X16B-8.0-8.5
Empty dish weight=	20.22		
Wet weight=	29.56		
Dry weight=	28.49		
AECOM %solids =	88.5	OK	Reported %solids= 88.5

Reporting Limit	JC27321-57T	P.25, 57,77	NFS-PDI-X16B-8.0-8.5
Low Standard	0.01		
Initial weight (mg/kg)	0.00243		
Final volume (L)	0.1		
Percent solids	0.885		
Dilution Factor	1		
Reporting Limit	0.46	OK, rounding	Reported RL (mg/Kg)= 0.45

Sample Calculations	JC27321-57T	P.25, 57,77	NFS-PDI-X16B-8.0-8.5
Background reading	0		
Total absorbance	0.009		
Total absorbance - background	0.009		
Instrument Response	0.013		
Sample weight (mg/kg)	0.00243		
Final Volume (L)	0.1		
Percent solids	0.885		
Dilution Factor	1		
AECOM Calculated Result (mg/Kg)	0.62	OK	Reported Result (mg/Kg) 0.62

Associated w/samples JC27321-42T through JC27321-57T

Data Validation Report

Project:	PPG - North Forest Street PDI
Laboratory:	SGS/Accutest, Dayton, NJ
Laboratory Job No.:	JC27321A
Analysis/Method:	Volatile Organic Compounds (VOCs) by GCMS/SW-846 8260C Semivolatile Organic Compounds (SVOCs) by GCMS/SW-846 8270D TAL Metals SW-846 3010A/3050B/6010C/7470A/7471B
Validation Level:	Limited
Site Location/Address:	70 Carteret Avenue
AECOM Project No:	60314351.GA.DE.PDI.NFS
Prepared by:	Charlene Livingston Flint /AECOM Completed on: 10/27/2016
Reviewed by:	Kristin Rutherford /AECOM File Name: JC27321A_2016-10-27_DVReport-F

Introduction

The data were reviewed in accordance with the FSP-QAPP and the following NJDEP and / or Region 2 validation Standard Operating Procedure(s) (SOP):

- NJDEP Office of Data Quality SOP 5.A.16, Rev 1 (May 2002), Quality Assurance Data Validation of Analytical Deliverables for Inorganics (based on USEPA SW-846 Methods);
- ICP-AES Data Validation, SOP No. HW-3a Revision 0 (July 2015);
- Mercury and Cyanide Data Validation, SOP No. HW-3c Revision 0 (July 2015);
- Low/Medium Volatile Data Validation, SOP No. HW-33A Revision 0 (July 2015);
- Semivolatile Data Validation SOP No. HW-35A Revision 0 (June 2015).

The results of quality control data analyzed with site samples were used to assess the overall reliability of the data. The following qualifiers were used to identify data quality issues:

- U: Indicates the analyte was not detected in the sample above the sample reporting limit.
- J: Indicates the result was an estimated value; the associated numerical value was an approximate concentration of the analyte in the sample.
- UJ: Indicates the analyte was not detected above the reporting limit and the reporting limit was approximate.
- UB: The analyte concentration is less than or equal to three (3) times the concentration in the associated method/prep blank. The presence of the analyte in the sample is negated (UB) due to laboratory contamination.

- JB: The analyte concentration is greater than three (3) times, but less than or equal to ten (10) times the concentration in the associated method/prep blank. The presence of that analyte in the sample is considered "real". The concentration is quantitatively qualified (JB) due to method blank contamination.
- R: The sample result was rejected due to serious deficiencies; the presence or absence of the analyte could not be confirmed.
- RA: The sample result was rejected due to NJ specific data validation QC requirements; however, the result is usable for project objectives. Refer to the Data Quality and Usability section in this data validation report for further discussion.

Sample Information

The samples listed below were collected by AECOM on September 9, 2016 as part of the PPG - North Forest Street PDI sampling at 70 Carteret Avenue, Jersey City, New Jersey. Only the samples and parameters listed below were validated.

Field ID	Laboratory ID	Matrix	Fraction
NFS-FB20160909 (Equipment Blank)	JC27321-1A	Aqueous	TAL Metals, SVOCs and VOCs
NFS-PDI-CC12B-0.0-0.5	JC27321-2A	Soil	TAL Metals, SVOCs and VOCs
NFS-PDI-CC12B-10.0-10.5	JC27321-3A	Soil	TAL Metals, SVOCs and VOCs
NFS-PDI-CC12B-12.0-12.5	JC27321-4A	Soil	TAL Metals, SVOCs and VOCs
NFS-PDI-CC12B-14.0-14.5	JC27321-5A	Soil	TAL Metals, SVOCs and VOCs
NFS-PDI-CC12B-16.0-16.5	JC27321-6A	Soil	TAL Metals, SVOCs and VOCs
NFS-PDI-CC12B-18.0-18.5	JC27321-7A	Soil	TAL Metals, SVOCs and VOCs
NFS-PDI-CC12B-2.0-2.5	JC27321-8A	Soil	TAL Metals, SVOCs and VOCs
NFS-PDI-CC12B-20.0-20.5	JC27321-9A	Soil	TAL Metals, SVOCs and VOCs
NFS-PDI-CC12B-4.0-4.5	JC27321-10A	Soil	TAL Metals, SVOCs and VOCs
NFS-PDI-CC12B-4.0-4.5X (Field Duplicate of NFS-PDI-CC12B-4.0-4.5)	JC27321-11A	Soil	TAL Metals, SVOCs and VOCs
NFS-PDI-CC12B-6.0-6.5	JC27321-12A	Soil	TAL Metals, SVOCs and VOCs
NFS-PDI-CC12B-8.0-8.5	JC27321-13A	Soil	TAL Metals, SVOCs and VOCs
NFS-PDI-CC12B-8.5-9.0	JC27321-14A	Soil	TAL Metals, SVOCs and VOCs

The samples were collected following the procedures detailed in the Work Order for Garfield Avenue Remedial Action (GARA) at 70 Carteret Avenue and the Field Sampling Plan/Quality Assurance Project Plan for Non-Residential and Residential Chromium Sites Hudson County, New Jersey (December 2011).

General Comments

The data package was complete. Quality control (QC) issues identified during validation are discussed below. Refer to the Target Analyte Summary Hit List(s) in Attachment A for a listing of all detected results, qualified results, and associated qualifications, where applicable. The nonconformances for each section discussed below are presented in Attachment B.

TAL Metals

Laboratory Blanks/Equipment Blanks

Aluminum, calcium, chromium, copper, iron, manganese, nickel, sodium and zinc were detected in the method blank (MB) MP95954, associated with the soil samples in this data set. These compounds were detected in the associated soil samples at concentrations greater than ten times the amount in the method blank; therefore, no qualifications were made.

Mercury was detected in the soil method blank MP95992, associated with all the soil samples in this SDG. Mercury was detected in soil samples NFS-PDI-CC12B-0.0-0.5 (JC27321-2A), NFS-PDI-CC12B-2.0-2.5 (JC27321-8A), NFS-PDI-CC12B-4.0-4.5 (JC27321-10A), and NFS-PDI-CC12B-4.0-4.5X (JC27321-11A) at concentrations greater than ten times the amount in the method blank. No qualifications were made on these soil samples.

Mercury was detected in sample NFS-PDI-CC12B-6.0-6.5 (JC27321-12A) at a concentration greater than three times but less than ten times the amount in the method blank; therefore, mercury was qualified as estimated (JB) in this sample.

Mercury was also detected in samples NFS-PDI-CC12B-10.0-10.5 (JC27321-3A), NFS-PDI-CC12B-12.0-12.5 (JC27321-4A), NFS-PDI-CC12B-14.0-14.5 (JC27321-5A), NFS-PDI-CC12B-16.0-16.5 (JC27321-6A), NFS-PDI-CC12B-18.0-18.5 (JC27321-7A), NFS-PDI-CC12B-20.0-20.5 (JC27321-9A), NFS-PDI-CC12B-8.0-8.5 (JC27321-13A) and NFS-PDI-CC12B-8.5-9.0 (JC27321-14A) at concentrations less than three times the amount in the method blank. Mercury was negated (UB) at the reporting limit (RL) in these soil samples.

Aluminum was detected in the aqueous method blank, MP95955, associated with the equipment blank NFS-FB20160909 (JC27321-1A), at a concentration greater than the method detection limit (MDL) but less than the RL. Since the result for aluminum in the equipment blank was less than three times the amount in the method blank, the result for aluminum in the equipment blank was negated (UB) at the RL.

Negative instrument drift was detected for magnesium and sodium in the aqueous method blank, MP95955, associated with the equipment blank NFS-FB20160909 (JC27321-1A). The nondetect result for magnesium in the equipment blank was qualified as estimated (UJ) with possible low bias. Since the result for sodium in the equipment blank was less than ten times the negative instrument drift, the result was qualified as estimated (J) with possible low bias.

Barium, calcium, iron, sodium, manganese and zinc were detected in the equipment blank, NFS--FB20160909, associated with the soil samples in this data set. With the exception of sodium, all of these analytes were detected in the associated soil samples at concentrations greater than ten times the amount in the equipment blank; therefore, no qualifications were made.

Sodium was detected at a concentration greater than ten times the amount in the equipment blank in all of the soil samples with the exception of sample NFS-PDI-CC12B-14.0-14.5 (JC27321-5A). Sample NFS-PDI-CC12B-14.0-14.5 detected sodium at a concentration greater than three times but less than ten times the amount in the equipment blank; therefore, the result for sodium was qualified as estimated (J) in this sample. No qualifications were made for sodium in all of the other soil samples.

Refer to the Target Analyte Summary Hit(s) in Attachment A for a listing of all results qualified on the basis of method and equipment blank contamination. Refer to the nonconformance tables in Appendix B for a listing of blank results and associated qualification actions.

Matrix Spike

Sample NFS-PDI-CC12B-6.0-6.5 (JC27321-12A) was analyzed as a matrix spike/matrix spike duplicate (MS/MSD) associated with the soil samples in this SDG. The MS/MSD exceeded the recovery (%R) QC limits for aluminum and iron. Aluminum was qualified as estimated (J) in the parent sample with a possible high bias. Since the sample result for iron was greater than four times the amount spiked, no qualifications were made for iron. The MS/MSD recovery was below QC limits for antimony and manganese. The results for antimony and manganese in the parent sample were qualified (J/UJ) as estimated and may be biased low.

Field Duplicates

Sample NFS-PDI-CC12B-4.0-4.5X (JC27321-11A) was collected as a field duplicate of sample NFS-PDI-CC12B-4.0-4.5 (JC27321-10A) from this site. The relative percent difference (RPD) between the parent sample result and the field duplicate result for manganese and iron did not meet QC criteria of less than 35%; therefore, the results for manganese and iron in the field duplicate pair were qualified (J) as estimated with unknown direction of bias due to poor field duplicate precision.

Sample results qualified for poor field duplicate precision are presented in the Metal Soil Target Analyte Summary Hit List in Attachment A and in the nonconformance table in Attachment B.

Sample Results

Reported results (flagged B by the laboratory) that were less than the RL but greater than or equal to the method detection limit (MDL) are approximate values and have been qualified as estimated (J).

VOCs

Sample Results

Reported results (flagged J by the laboratory) that were less than the RL, but greater than or equal to the MDL, are approximate values and have been qualified as estimated (J).

SVOCs

Laboratory Blanks/Equipment Blanks

Bis(2-ethylhexyl)phthalate was detected in the aqueous method blank associated with the equipment blank, NFS-FB20160909, in this data set. Since bis(2-ethylhexyl)phthalate was not detected in the equipment blank, no qualifications were required.

Field Duplicates

Sample NFS-PDI-CC12B-4.0-4.5X (JC27321-11A) was collected as a field duplicate of NFS-PDI-CC12B-4.0-4.5 (JC27321-10A) from this site. The RPD between the parent sample result and the field duplicate result for carbazole, pyrene, fluoranthene, phenanthrene, acenaphthene, fluorene, naphthalene, 2-methylnaphthalene, 1,1'-biphenyl, anthracene, dibenzofuran, m-dichlorobenzene, benzo(g,h,i)perylene, benzo(a)anthracene, dibenzo(a,h)anthracene, benzo(a)pyrene, acenaphthylene, benzo(k)fluoranthene, benzo(b)fluoranthene, chrysene and indeno(1,2,3-cd)pyrene did not meet QC criteria of less than 50%; therefore, the results for these compounds in the field duplicate pair were qualified (J) as estimated with unknown direction of bias due to poor field duplicate precision.

Sample Results

The nondetect result for 2,4-dinitrophenol in sample NFS-PDI-CC12B-2.0-2.5 (JC27321-2A) exceeded the NJDEP Default Impact to Ground Water Soil Screening Level (DIGWSSL); therefore, the nondetect result may not meet project objectives. Refer to the nonconformance tables in Appendix B for a listing of results exceeding the NJDEP DIGWSSL criteria.

Reported results (flagged J by the laboratory), that were less than the RL, but greater than or equal to the MDL are approximate values and have been qualified as estimated (J).

Data Quality and Usability

The following issues were noted for this sample set:

- The result for aluminum in sample NFS-PDI-CC12B-6.0-6.5 (JC27321-12A) is usable as an estimated result with a possible high bias due to high MS/MSD recovery.
- The results for antimony and manganese in sample NFS-PDI-CC12B-6.0-6.5 (JC27321-12A) are usable as estimated results with possible low bias due to low MS/MSD recovery.
- The result for mercury in sample NFS-PDI-CC12B-6.0-6.5 (JC27321-12A) is usable as an estimated result with possible high bias due to method blank contamination.
- The results for manganese and iron in all soil samples in this data set were estimated with unknown direction of bias due to poor field duplicate precision.
- Mercury was negated at the RL in samples NFS-PDI-CC12B-10.0-10.5 (JC27321-3A), NFS-PDI-CC12B-12.0-12.5 (JC27321-4A), NFS-PDI-CC12B-14.0-14.5 (JC27321-5A), NFS-PDI-CC12B-16.0-16.5 (JC27321-6A), NFS-PDI-CC12B-18.0-18.5 (JC27321-7A), NFS-PDI-CC12B-20.0-20.5 (JC27321-9A), NFS-PDI-CC12B-8.0-8.5 (JC27321-13A), and NFS-PDI-CC12B-8.5-9.0 (JC27321-14A) due to method blank contamination.
- Aluminum was negated at the RL in equipment blank NFS-FB20160909 due to method blank contamination.
- The result for magnesium in equipment blank NFS-FB20160909 is usable as an estimated nondetect result with possible low bias due to negative instrument drift.
- Sodium was estimated in the equipment blank NFS-FB20160909 due to negative instrument drift with a possible low bias.
- Sodium was estimated with possible high bias in sample NFS-PDI-CC12B-14.0-14.5 due to equipment blank contamination.
- The results for carbazole, pyrene, fluoranthene, phenanthrene, acenaphthene, fluorene, naphthalene, 2-methylnaphthalene, 1,1'-biphenyl, anthracene, dibenzofuran, m-dichlorobenzene, benzo(g,h,i)perylene, benzo(a)anthracene, dibenzo(a,h)anthracene, benzo(a)pyrene, acenaphthylene, benzo(k)fluoranthene, benzo(b)fluoranthene, chrysene and indeno(1,2,3-cd)pyrene were estimated in the field duplicate pair with unknown direction of bias due to poor field duplicate precision.
- The nondetect results for selected SVOCs exceeded the NJDEP DIGWSSL levels; therefore, the nondetect results may not meet project objectives.

- Sample results reported between the MDL and RL were estimated with an unknown directional bias.

ATTACHMENTS

Attachment A: Target Analyte Summary Hit List(s)

Attachment B: Data Validation Report Form

Attachment A

Target Analyte Summary Hit List(s)

Soil Target Analyte Summary Hit List (TAL Metals)

Site Name PPG - North Forest Street PDI
Sampling Date September 9, 2016
Lab Name/ID SGS/Accutest, Dayton, NJ
SDG No JC27321A
Sample Matrix Soil
Trip Blank ID NA
Field Blank ID NFS--FB20160909

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
NFS-PDI-CC12B-0.0-0.5	JC27321-2A	ALUMINUM	7.4	7080	7080	64		
NFS-PDI-CC12B-0.0-0.5	JC27321-2A	ANTIMONY	U	1.1B	1.1	2.6	Qualify	5
NFS-PDI-CC12B-0.0-0.5	JC27321-2A	ARSENIC	U	5.0	5.0	2.6		
NFS-PDI-CC12B-0.0-0.5	JC27321-2A	BARIUM	U	145	145	26		
NFS-PDI-CC12B-0.0-0.5	JC27321-2A	BERYLLIUM	U	0.27	0.27	0.26		
NFS-PDI-CC12B-0.0-0.5	JC27321-2A	CADMIUM	U	0.89	0.89	0.64		
NFS-PDI-CC12B-0.0-0.5	JC27321-2A	CALCIUM METAL	14.9	10600	10600	640		
NFS-PDI-CC12B-0.0-0.5	JC27321-2A	CHROMIUM	0.15	192	192	1.3		
NFS-PDI-CC12B-0.0-0.5	JC27321-2A	COBALT	U	11.3	11.3	6.4		
NFS-PDI-CC12B-0.0-0.5	JC27321-2A	COPPER	0.21	88.2	88.2	3.2		
NFS-PDI-CC12B-0.0-0.5	JC27321-2A	IRON	4.3	26100	26100	64		
NFS-PDI-CC12B-0.0-0.5	JC27321-2A	LEAD	U	225	225	2.6		
NFS-PDI-CC12B-0.0-0.5	JC27321-2A	MAGNESIUM	U	4790	4790	640		
NFS-PDI-CC12B-0.0-0.5	JC27321-2A	MANGANESE	0.13	353	353	1.9		
NFS-PDI-CC12B-0.0-0.5	JC27321-2A	NICKEL	0.15	46.8	46.8	5.1		
NFS-PDI-CC12B-0.0-0.5	JC27321-2A	POTASSIUM	U	819B	819	1300	Qualify	5
NFS-PDI-CC12B-0.0-0.5	JC27321-2A	SILVER	U	0.58B	0.58	0.64	Qualify	5

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
NFS-PDI-CC12B-0.0-0.5	JC27321-2A	SODIUM	6.5	406B	406	1300	Qualify	5
NFS-PDI-CC12B-0.0-0.5	JC27321-2A	VANADIUM	U	73.3	73.3	6.4		
NFS-PDI-CC12B-0.0-0.5	JC27321-2A	ZINC	U	333	333	6.4		
NFS-PDI-CC12B-10.0-10.5	JC27321-3A	ALUMINUM	7.4	3800	3800	55		
NFS-PDI-CC12B-10.0-10.5	JC27321-3A	ARSENIC	U	6.7	6.7	2.2		
NFS-PDI-CC12B-10.0-10.5	JC27321-3A	BARIUM	U	31.5	31.5	22		
NFS-PDI-CC12B-10.0-10.5	JC27321-3A	BERYLLIUM	U	0.43	0.43	0.22		
NFS-PDI-CC12B-10.0-10.5	JC27321-3A	CADMIUM	U	0.15B	0.15	0.55	Qualify	5
NFS-PDI-CC12B-10.0-10.5	JC27321-3A	CALCIUM METAL	14.9	7330	7330	550		
NFS-PDI-CC12B-10.0-10.5	JC27321-3A	CHROMIUM	0.15	31.3	31.3	1.1		
NFS-PDI-CC12B-10.0-10.5	JC27321-3A	COBALT	U	4.6B	4.6	5.5	Qualify	5
NFS-PDI-CC12B-10.0-10.5	JC27321-3A	COPPER	0.21	20.3	20.3	2.7		
NFS-PDI-CC12B-10.0-10.5	JC27321-3A	IRON	4.3	12600	12600	55		
NFS-PDI-CC12B-10.0-10.5	JC27321-3A	LEAD	U	34.7	34.7	2.2		
NFS-PDI-CC12B-10.0-10.5	JC27321-3A	MAGNESIUM	U	3030	3030	550		
NFS-PDI-CC12B-10.0-10.5	JC27321-3A	MANGANESE	0.13	214	214	1.6		
NFS-PDI-CC12B-10.0-10.5	JC27321-3A	NICKEL	0.15	11.2	11.2	4.4		
NFS-PDI-CC12B-10.0-10.5	JC27321-3A	POTASSIUM	U	1140	1140	1100		
NFS-PDI-CC12B-10.0-10.5	JC27321-3A	SILVER	U	0.19B	0.19	0.55	Qualify	5
NFS-PDI-CC12B-10.0-10.5	JC27321-3A	SODIUM	6.5	221B	221	1100	Qualify	5
NFS-PDI-CC12B-10.0-10.5	JC27321-3A	VANADIUM	U	21.9	21.9	5.5		
NFS-PDI-CC12B-10.0-10.5	JC27321-3A	ZINC	U	87.6	87.6	5.5		
NFS-PDI-CC12B-12.0-12.5	JC27321-4A	ALUMINUM	7.4	8350	8350	54		
NFS-PDI-CC12B-12.0-12.5	JC27321-4A	ARSENIC	U	10.0	10.0	2.1		

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
NFS-PDI-CC12B-12.0-12.5	JC27321-4A	BARIUM	U	47.8	47.8	21		
NFS-PDI-CC12B-12.0-12.5	JC27321-4A	BERYLLIUM	U	0.57	0.57	0.21		
NFS-PDI-CC12B-12.0-12.5	JC27321-4A	CALCIUM METAL	14.9	8380	8380	540		
NFS-PDI-CC12B-12.0-12.5	JC27321-4A	CHROMIUM	0.15	23.2	23.2	1.1		
NFS-PDI-CC12B-12.0-12.5	JC27321-4A	COBALT	U	9.2	9.2	5.4		
NFS-PDI-CC12B-12.0-12.5	JC27321-4A	COPPER	0.21	20.2	20.2	2.7		
NFS-PDI-CC12B-12.0-12.5	JC27321-4A	IRON	4.3	17800	17800	54		
NFS-PDI-CC12B-12.0-12.5	JC27321-4A	LEAD	U	15.2	15.2	2.1		
NFS-PDI-CC12B-12.0-12.5	JC27321-4A	MAGNESIUM	U	8710	8710	540		
NFS-PDI-CC12B-12.0-12.5	JC27321-4A	MANGANESE	0.13	304	304	1.6		
NFS-PDI-CC12B-12.0-12.5	JC27321-4A	NICKEL	0.15	15.7	15.7	4.3		
NFS-PDI-CC12B-12.0-12.5	JC27321-4A	POTASSIUM	U	1260	1260	1100		
NFS-PDI-CC12B-12.0-12.5	JC27321-4A	SILVER	U	0.31B	0.31	0.54	Qualify	5
NFS-PDI-CC12B-12.0-12.5	JC27321-4A	SODIUM	6.5	413B	413	1100	Qualify	5
NFS-PDI-CC12B-12.0-12.5	JC27321-4A	VANADIUM	U	32.6	32.6	5.4		
NFS-PDI-CC12B-12.0-12.5	JC27321-4A	ZINC	U	44.8	44.8	5.4		
NFS-PDI-CC12B-14.0-14.5	JC27321-5A	ALUMINUM	7.4	4650	4650	57		
NFS-PDI-CC12B-14.0-14.5	JC27321-5A	ARSENIC	U	3.0	3.0	2.3		
NFS-PDI-CC12B-14.0-14.5	JC27321-5A	BARIUM	U	30.7	30.7	23		
NFS-PDI-CC12B-14.0-14.5	JC27321-5A	BERYLLIUM	U	0.45	0.45	0.23		
NFS-PDI-CC12B-14.0-14.5	JC27321-5A	CALCIUM METAL	14.9	1120	1120	570		
NFS-PDI-CC12B-14.0-14.5	JC27321-5A	CHROMIUM	0.15	16.7	16.7	1.1		
NFS-PDI-CC12B-14.0-14.5	JC27321-5A	COBALT	U	4.2B	4.2	5.7	Qualify	5
NFS-PDI-CC12B-14.0-14.5	JC27321-5A	COPPER	0.21	7.9	7.9	2.9		

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
NFS-PDI-CC12B-14.0-14.5	JC27321-5A	IRON	4.3	9310	9310	57		
NFS-PDI-CC12B-14.0-14.5	JC27321-5A	LEAD	U	11.0	11.0	2.3		
NFS-PDI-CC12B-14.0-14.5	JC27321-5A	MAGNESIUM	U	1890	1890	570		
NFS-PDI-CC12B-14.0-14.5	JC27321-5A	MANGANESE	0.13	280	280	1.7		
NFS-PDI-CC12B-14.0-14.5	JC27321-5A	NICKEL	0.15	7.9	7.9	4.6		
NFS-PDI-CC12B-14.0-14.5	JC27321-5A	POTASSIUM	U	909B	909	1100	Qualify	5
NFS-PDI-CC12B-14.0-14.5	JC27321-5A	SODIUM	6.5	81.9B	81.9	1100	Qualify	3,5
NFS-PDI-CC12B-14.0-14.5	JC27321-5A	VANADIUM	U	16.8	16.8	5.7		
NFS-PDI-CC12B-14.0-14.5	JC27321-5A	ZINC	U	30.0	30.0	5.7		
NFS-PDI-CC12B-16.0-16.5	JC27321-6A	ALUMINUM	7.4	3760	3760	58		
NFS-PDI-CC12B-16.0-16.5	JC27321-6A	ARSENIC	U	2.5	2.5	2.3		
NFS-PDI-CC12B-16.0-16.5	JC27321-6A	BARIUM	U	25.4	25.4	23		
NFS-PDI-CC12B-16.0-16.5	JC27321-6A	BERYLLIUM	U	0.42	0.42	0.23		
NFS-PDI-CC12B-16.0-16.5	JC27321-6A	CALCIUM METAL	14.9	1040	1040	580		
NFS-PDI-CC12B-16.0-16.5	JC27321-6A	CHROMIUM	0.15	15.1	15.1	1.2		
NFS-PDI-CC12B-16.0-16.5	JC27321-6A	COBALT	U	3.1B	3.1	5.8	Qualify	5
NFS-PDI-CC12B-16.0-16.5	JC27321-6A	COPPER	0.21	7.4	7.4	2.9		
NFS-PDI-CC12B-16.0-16.5	JC27321-6A	IRON	4.3	7840	7840	58		
NFS-PDI-CC12B-16.0-16.5	JC27321-6A	LEAD	U	7.2	7.2	2.3		
NFS-PDI-CC12B-16.0-16.5	JC27321-6A	MAGNESIUM	U	1850	1850	580		
NFS-PDI-CC12B-16.0-16.5	JC27321-6A	MANGANESE	0.13	251	251	1.8		
NFS-PDI-CC12B-16.0-16.5	JC27321-6A	NICKEL	0.15	6.4	6.4	4.7		
NFS-PDI-CC12B-16.0-16.5	JC27321-6A	POTASSIUM	U	713B	713	1200	Qualify	5
NFS-PDI-CC12B-16.0-16.5	JC27321-6A	SODIUM	6.5	86.9B	86.9	1200	Qualify	5

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
NFS-PDI-CC12B-16.0-16.5	JC27321-6A	VANADIUM	U	13.9	13.9	5.8		
NFS-PDI-CC12B-16.0-16.5	JC27321-6A	ZINC	U	26.3	26.3	5.8		
NFS-PDI-CC12B-18.0-18.5	JC27321-7A	ALUMINIUM	7.4	6500	6500	54		
NFS-PDI-CC12B-18.0-18.5	JC27321-7A	ARSENIC	U	5.4	5.4	2.1		
NFS-PDI-CC12B-18.0-18.5	JC27321-7A	BARIUM	U	42.2	42.2	21		
NFS-PDI-CC12B-18.0-18.5	JC27321-7A	BERYLLIUM	U	0.70	0.70	0.21		
NFS-PDI-CC12B-18.0-18.5	JC27321-7A	CALCIUM METAL	14.9	1960	1960	540		
NFS-PDI-CC12B-18.0-18.5	JC27321-7A	CHROMIUM	0.15	28.9	28.9	1.1		
NFS-PDI-CC12B-18.0-18.5	JC27321-7A	COBALT	U	5.7	5.7	5.4		
NFS-PDI-CC12B-18.0-18.5	JC27321-7A	COPPER	0.21	11.6	11.6	2.7		
NFS-PDI-CC12B-18.0-18.5	JC27321-7A	IRON	4.3	12200	12200	54		
NFS-PDI-CC12B-18.0-18.5	JC27321-7A	LEAD	U	15.6	15.6	2.1		
NFS-PDI-CC12B-18.0-18.5	JC27321-7A	MAGNESIUM	U	2880	2880	540		
NFS-PDI-CC12B-18.0-18.5	JC27321-7A	MANGANESE	0.13	320	320	1.6		
NFS-PDI-CC12B-18.0-18.5	JC27321-7A	NICKEL	0.15	10.3	10.3	4.3		
NFS-PDI-CC12B-18.0-18.5	JC27321-7A	POTASSIUM	U	1220	1220	1100		
NFS-PDI-CC12B-18.0-18.5	JC27321-7A	SILVER	U	0.14B	0.14	0.54	Qualify	5
NFS-PDI-CC12B-18.0-18.5	JC27321-7A	SODIUM	6.5	118B	118	1100	Qualify	5
NFS-PDI-CC12B-18.0-18.5	JC27321-7A	VANADIUM	U	23.5	23.5	5.4		
NFS-PDI-CC12B-18.0-18.5	JC27321-7A	ZINC	U	50.0	50.0	5.4		
NFS-PDI-CC12B-2.0-2.5	JC27321-8A	ALUMINIUM	7.4	4870	4870	59		
NFS-PDI-CC12B-2.0-2.5	JC27321-8A	ANTIMONY	U	0.43B	0.43	2.4	Qualify	5
NFS-PDI-CC12B-2.0-2.5	JC27321-8A	ARSENIC	U	12.0	12.0	2.4		
NFS-PDI-CC12B-2.0-2.5	JC27321-8A	BARIUM	U	54.5	54.5	24		

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
NFS-PDI-CC12B-2.0-2.5	JC27321-8A	BERYLLIUM	U	0.59	0.59	0.24		
NFS-PDI-CC12B-2.0-2.5	JC27321-8A	CADMIUM	U	0.13B	0.13	0.59	Qualify	5
NFS-PDI-CC12B-2.0-2.5	JC27321-8A	CALCIUM METAL	14.9	3800	3800	590		
NFS-PDI-CC12B-2.0-2.5	JC27321-8A	CHROMIUM	0.15	112	112	1.2		
NFS-PDI-CC12B-2.0-2.5	JC27321-8A	COBALT	U	6.2	6.2	5.9		
NFS-PDI-CC12B-2.0-2.5	JC27321-8A	COPPER	0.21	44.6	44.6	3.0		
NFS-PDI-CC12B-2.0-2.5	JC27321-8A	IRON	4.3	14000	14000	59		
NFS-PDI-CC12B-2.0-2.5	JC27321-8A	LEAD	U	68.3	68.3	2.4		
NFS-PDI-CC12B-2.0-2.5	JC27321-8A	MAGNESIUM	U	2310	2310	590		
NFS-PDI-CC12B-2.0-2.5	JC27321-8A	MANGANESE	0.13	237	237	1.8		
NFS-PDI-CC12B-2.0-2.5	JC27321-8A	NICKEL	0.15	15.2	15.2	4.7		
NFS-PDI-CC12B-2.0-2.5	JC27321-8A	POTASSIUM	U	933B	933	1200	Qualify	5
NFS-PDI-CC12B-2.0-2.5	JC27321-8A	SILVER	U	0.38B	0.38	0.59	Qualify	5
NFS-PDI-CC12B-2.0-2.5	JC27321-8A	SODIUM	6.5	106B	106	1200	Qualify	5
NFS-PDI-CC12B-2.0-2.5	JC27321-8A	VANADIUM	U	18.1	18.1	5.9		
NFS-PDI-CC12B-2.0-2.5	JC27321-8A	ZINC	U	201	201	5.9		
NFS-PDI-CC12B-20.0-20.5	JC27321-9A	ALUMINUM	7.4	4980	4980	62		
NFS-PDI-CC12B-20.0-20.5	JC27321-9A	ARSENIC	U	3.4	3.4	2.5		
NFS-PDI-CC12B-20.0-20.5	JC27321-9A	BARIUM	U	33.4	33.4	25		
NFS-PDI-CC12B-20.0-20.5	JC27321-9A	BERYLLIUM	U	0.38	0.38	0.25		
NFS-PDI-CC12B-20.0-20.5	JC27321-9A	CADMIUM	U	0.074B	0.074	0.62	Qualify	5
NFS-PDI-CC12B-20.0-20.5	JC27321-9A	CALCIUM METAL	14.9	1850	1850	620		
NFS-PDI-CC12B-20.0-20.5	JC27321-9A	CHROMIUM	0.15	49.5	49.5	1.2		
NFS-PDI-CC12B-20.0-20.5	JC27321-9A	COBALT	U	4.4B	4.4	6.2	Qualify	5

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
NFS-PDI-CC12B-20.0-20.5	JC27321-9A	COPPER	0.21	10.8	10.8	3.1		
NFS-PDI-CC12B-20.0-20.5	JC27321-9A	IRON	4.3	11300	11300	62		
NFS-PDI-CC12B-20.0-20.5	JC27321-9A	LEAD	U	7.3	7.3	2.5		
NFS-PDI-CC12B-20.0-20.5	JC27321-9A	MAGNESIUM	U	2090	2090	620		
NFS-PDI-CC12B-20.0-20.5	JC27321-9A	MANGANESE	0.13	258	258	1.8		
NFS-PDI-CC12B-20.0-20.5	JC27321-9A	NICKEL	0.15	9.5	9.5	4.9		
NFS-PDI-CC12B-20.0-20.5	JC27321-9A	POTASSIUM	U	1250	1250	1200		
NFS-PDI-CC12B-20.0-20.5	JC27321-9A	SODIUM	6.5	186B	186	1200	Qualify	5
NFS-PDI-CC12B-20.0-20.5	JC27321-9A	VANADIUM	U	17.6	17.6	6.2		
NFS-PDI-CC12B-20.0-20.5	JC27321-9A	ZINC	U	32.5	32.5	6.2		
NFS-PDI-CC12B-4.0-4.5	JC27321-10A	ALUMINUM	7.4	10500	10500	64		
NFS-PDI-CC12B-4.0-4.5	JC27321-10A	ANTIMONY	U	0.38B	0.38	2.6	Qualify	5
NFS-PDI-CC12B-4.0-4.5	JC27321-10A	ARSENIC	U	6.5	6.5	2.6		
NFS-PDI-CC12B-4.0-4.5	JC27321-10A	BARIUM	U	72.6	72.6	26		
NFS-PDI-CC12B-4.0-4.5	JC27321-10A	BERYLLIUM	U	0.48	0.48	0.26		
NFS-PDI-CC12B-4.0-4.5	JC27321-10A	CADMIUM	U	0.37B	0.37	0.64	Qualify	5
NFS-PDI-CC12B-4.0-4.5	JC27321-10A	CALCIUM METAL	14.9	4870	4870	640		
NFS-PDI-CC12B-4.0-4.5	JC27321-10A	CHROMIUM	0.15	21.8	21.8	1.3		
NFS-PDI-CC12B-4.0-4.5	JC27321-10A	COBALT	U	6.6	6.6	6.4		
NFS-PDI-CC12B-4.0-4.5	JC27321-10A	COPPER	0.21	51.1	51.1	3.2		
NFS-PDI-CC12B-4.0-4.5	JC27321-10A	IRON	4.3	16200	16200	64	Qualify	4
NFS-PDI-CC12B-4.0-4.5	JC27321-10A	LEAD	U	156	156	2.6		
NFS-PDI-CC12B-4.0-4.5	JC27321-10A	MAGNESIUM	U	2910	2910	640		
NFS-PDI-CC12B-4.0-4.5	JC27321-10A	MANGANESE	0.13	381	381	1.9	Qualify	4

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
NFS-PDI-CC12B-4.0-4.5	JC27321-10A	NICKEL	0.15	14.4	14.4	5.1		
NFS-PDI-CC12B-4.0-4.5	JC27321-10A	POTASSIUM	U	1010B	1010	1300	Qualify	5
NFS-PDI-CC12B-4.0-4.5	JC27321-10A	SELENIUM	U	0.70B	0.70	2.6	Qualify	5
NFS-PDI-CC12B-4.0-4.5	JC27321-10A	SILVER	U	0.33B	0.33	0.64	Qualify	5
NFS-PDI-CC12B-4.0-4.5	JC27321-10A	SODIUM	6.5	118B	118	1300	Qualify	5
NFS-PDI-CC12B-4.0-4.5	JC27321-10A	VANADIUM	U	17.9	17.9	6.4		
NFS-PDI-CC12B-4.0-4.5	JC27321-10A	ZINC	U	667	667	6.4		
NFS-PDI-CC12B-4.0-4.5X	JC27321-11A	ALUMINUM	7.4	10500	10500	61		
NFS-PDI-CC12B-4.0-4.5X	JC27321-11A	ARSENIC	U	6.2	6.2	2.5		
NFS-PDI-CC12B-4.0-4.5X	JC27321-11A	BARIUM	U	85.5	85.5	25		
NFS-PDI-CC12B-4.0-4.5X	JC27321-11A	BERYLLIUM	U	0.49	0.49	0.25		
NFS-PDI-CC12B-4.0-4.5X	JC27321-11A	CADMIUM	U	0.28B	0.28	0.61	Qualify	5
NFS-PDI-CC12B-4.0-4.5X	JC27321-11A	CALCIUM METAL	14.9	4950	4950	610		
NFS-PDI-CC12B-4.0-4.5X	JC27321-11A	CHROMIUM	0.15	19.0	19.0	1.2		
NFS-PDI-CC12B-4.0-4.5X	JC27321-11A	COBALT	U	7.5	7.5	6.1		
NFS-PDI-CC12B-4.0-4.5X	JC27321-11A	COPPER	0.21	53.4	53.4	3.1		
NFS-PDI-CC12B-4.0-4.5X	JC27321-11A	IRON	4.3	25300	25300	61	Qualify	4
NFS-PDI-CC12B-4.0-4.5X	JC27321-11A	LEAD	U	156	156	2.5		
NFS-PDI-CC12B-4.0-4.5X	JC27321-11A	MAGNESIUM	U	3040	3040	610		
NFS-PDI-CC12B-4.0-4.5X	JC27321-11A	MANGANESE	0.13	663	663	1.8	Qualify	4
NFS-PDI-CC12B-4.0-4.5X	JC27321-11A	NICKEL	0.15	15.2	15.2	4.9		
NFS-PDI-CC12B-4.0-4.5X	JC27321-11A	POTASSIUM	U	1000B	1000	1200	Qualify	5
NFS-PDI-CC12B-4.0-4.5X	JC27321-11A	SILVER	U	0.38B	0.38	0.61	Qualify	5
NFS-PDI-CC12B-4.0-4.5X	JC27321-11A	SODIUM	6.5	128B	128	1200	Qualify	5

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
NFS-PDI-CC12B-4.0-4.5X	JC27321-11A	VANADIUM	U	21.3	21.3	6.1		
NFS-PDI-CC12B-4.0-4.5X	JC27321-11A	ZINC	U	577	577	6.1		
NFS-PDI-CC12B-6.0-6.5	JC27321-12A	ALUMINUM	7.4	9000	9000	62	Qualify	6
NFS-PDI-CC12B-6.0-6.5	JC27321-12A	ANTIMONY	U	U	U	2.5	Qualify	7
NFS-PDI-CC12B-6.0-6.5	JC27321-12A	ARSENIC	U	2.9	2.9	2.5		
NFS-PDI-CC12B-6.0-6.5	JC27321-12A	BARIUM	U	25.1	25.1	25		
NFS-PDI-CC12B-6.0-6.5	JC27321-12A	BERYLLIUM	U	0.33	0.33	0.25		
NFS-PDI-CC12B-6.0-6.5	JC27321-12A	CALCIUM METAL	14.9	695	695	620		
NFS-PDI-CC12B-6.0-6.5	JC27321-12A	CHROMIUM	0.15	36.8	36.8	1.2		
NFS-PDI-CC12B-6.0-6.5	JC27321-12A	COBALT	U	7.1	7.1	6.2		
NFS-PDI-CC12B-6.0-6.5	JC27321-12A	COPPER	0.21	16.5	16.5	3.1		
NFS-PDI-CC12B-6.0-6.5	JC27321-12A	IRON	4.3	16100	16100	62		
NFS-PDI-CC12B-6.0-6.5	JC27321-12A	LEAD	U	6.8	6.8	2.5		
NFS-PDI-CC12B-6.0-6.5	JC27321-12A	MAGNESIUM	U	3360	3360	620		
NFS-PDI-CC12B-6.0-6.5	JC27321-12A	MANGANESE	0.13	483	483	1.9	Qualify	7
NFS-PDI-CC12B-6.0-6.5	JC27321-12A	NICKEL	0.15	13.6	13.6	4.9		
NFS-PDI-CC12B-6.0-6.5	JC27321-12A	POTASSIUM	U	1000B	1000	1200	Qualify	5
NFS-PDI-CC12B-6.0-6.5	JC27321-12A	SILVER	U	0.25B	0.25	0.62	Qualify	5
NFS-PDI-CC12B-6.0-6.5	JC27321-12A	SODIUM	6.5	105B	105	1200	Qualify	5
NFS-PDI-CC12B-6.0-6.5	JC27321-12A	VANADIUM	U	15.4	15.4	6.2		
NFS-PDI-CC12B-6.0-6.5	JC27321-12A	ZINC	U	39.2	39.2	6.2		
NFS-PDI-CC12B-8.0-8.5	JC27321-13A	ALUMINUM	7.4	13400	13400	61		
NFS-PDI-CC12B-8.0-8.5	JC27321-13A	ARSENIC	U	4.7	4.7	2.4		
NFS-PDI-CC12B-8.0-8.5	JC27321-13A	BARIUM	U	43.7	43.7	24		

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
NFS-PDI-CC12B-8.0-8.5	JC27321-13A	BERYLLIUM	U	0.57	0.57	0.24		
NFS-PDI-CC12B-8.0-8.5	JC27321-13A	CALCIUM METAL	14.9	1230	1230	610		
NFS-PDI-CC12B-8.0-8.5	JC27321-13A	CHROMIUM	0.15	153	153	1.2		
NFS-PDI-CC12B-8.0-8.5	JC27321-13A	COBALT	U	5.3B	5.3	6.1	Qualify	5
NFS-PDI-CC12B-8.0-8.5	JC27321-13A	COPPER	0.21	11.4	11.4	3.0		
NFS-PDI-CC12B-8.0-8.5	JC27321-13A	IRON	4.3	16500	16500	61		
NFS-PDI-CC12B-8.0-8.5	JC27321-13A	LEAD	U	10.7	10.7	2.4		
NFS-PDI-CC12B-8.0-8.5	JC27321-13A	MAGNESIUM	U	2740	2740	610		
NFS-PDI-CC12B-8.0-8.5	JC27321-13A	MANGANESE	0.13	194	194	1.8		
NFS-PDI-CC12B-8.0-8.5	JC27321-13A	NICKEL	0.15	11.5	11.5	4.9		
NFS-PDI-CC12B-8.0-8.5	JC27321-13A	POTASSIUM	U	950B	950	1200	Qualify	5
NFS-PDI-CC12B-8.0-8.5	JC27321-13A	SILVER	U	0.17B	0.17	0.61	Qualify	5
NFS-PDI-CC12B-8.0-8.5	JC27321-13A	SODIUM	6.5	151B	151	1200	Qualify	5
NFS-PDI-CC12B-8.0-8.5	JC27321-13A	VANADIUM	U	30.3	30.3	6.1		
NFS-PDI-CC12B-8.0-8.5	JC27321-13A	ZINC	U	29.3	29.3	6.1		
NFS-PDI-CC12B-8.5-9.0	JC27321-14A	ALUMINUM	7.4	9670	9670	59		
NFS-PDI-CC12B-8.5-9.0	JC27321-14A	ARSENIC	U	4.2	4.2	2.3		
NFS-PDI-CC12B-8.5-9.0	JC27321-14A	BARIUM	U	45.3	45.3	23		
NFS-PDI-CC12B-8.5-9.0	JC27321-14A	BERYLLIUM	U	0.60	0.60	0.23		
NFS-PDI-CC12B-8.5-9.0	JC27321-14A	CALCIUM METAL	14.9	1020	1020	590		
NFS-PDI-CC12B-8.5-9.0	JC27321-14A	CHROMIUM	0.15	80.8	80.8	1.2		
NFS-PDI-CC12B-8.5-9.0	JC27321-14A	COBALT	U	5.5B	5.5	5.9	Qualify	5
NFS-PDI-CC12B-8.5-9.0	JC27321-14A	COPPER	0.21	13.5	13.5	2.9		
NFS-PDI-CC12B-8.5-9.0	JC27321-14A	IRON	4.3	16400	16400	59		

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
NFS-PDI-CC12B-8.5-9.0	JC27321-14A	LEAD	U	8.0	8.0	2.3		
NFS-PDI-CC12B-8.5-9.0	JC27321-14A	MAGNESIUM	U	2430	2430	590		
NFS-PDI-CC12B-8.5-9.0	JC27321-14A	MANGANESE	0.13	275	275	1.8		
NFS-PDI-CC12B-8.5-9.0	JC27321-14A	NICKEL	0.15	10.1	10.1	4.7		
NFS-PDI-CC12B-8.5-9.0	JC27321-14A	POTASSIUM	U	971B	971	1200	Qualify	5
NFS-PDI-CC12B-8.5-9.0	JC27321-14A	SILVER	U	0.25B	0.25	0.59	Qualify	5
NFS-PDI-CC12B-8.5-9.0	JC27321-14A	SODIUM	6.5	114B	114	1200	Qualify	5
NFS-PDI-CC12B-8.5-9.0	JC27321-14A	VANADIUM	U	23.5	23.5	5.9		
NFS-PDI-CC12B-8.5-9.0	JC27321-14A	ZINC	U	30.8	30.8	5.9		
NFS-PDI-CC12B-0.0-0.5	JC27321-2A	MERCURY	0.013	0.30	0.30	0.039		
NFS-PDI-CC12B-10.0-10.5	JC27321-3A	MERCURY	0.013	0.034	U	0.034	Negate	2
NFS-PDI-CC12B-12.0-12.5	JC27321-4A	MERCURY	0.013	0.030B	U	0.034	Negate	2
NFS-PDI-CC12B-14.0-14.5	JC27321-5A	MERCURY	0.013	0.033B	U	0.039	Negate	2
NFS-PDI-CC12B-16.0-16.5	JC27321-6A	MERCURY	0.013	0.027B	U	0.036	Negate	2
NFS-PDI-CC12B-18.0-18.5	JC27321-7A	MERCURY	0.013	0.034B	U	0.035	Negate	2
NFS-PDI-CC12B-2.0-2.5	JC27321-8A	MERCURY	0.013	0.22	0.22	0.037		
NFS-PDI-CC12B-20.0-20.5	JC27321-9A	MERCURY	0.013	0.025B	U	0.037	Negate	2
NFS-PDI-CC12B-4.0-4.5	JC27321-10A	MERCURY	0.013	0.88	0.88	0.041		
NFS-PDI-CC12B-4.0-4.5X	JC27321-11A	MERCURY	0.013	0.85	0.85	0.042		
NFS-PDI-CC12B-6.0-6.5	JC27321-12A	MERCURY	0.013	0.080	0.080	0.038	Qualify	1
NFS-PDI-CC12B-8.0-8.5	JC27321-13A	MERCURY	0.013	0.033B	U	0.039	Negate	2
NFS-PDI-CC12B-8.5-9.0	JC27321-14A	MERCURY	0.013	0.039	U	0.039	Negate	2

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

NJDEP Laboratory Footnote

1. The value reported is greater than three (3) but less than ten (10) times the value in the method blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to the method blank contamination. The "B" qualifier alerts the end-user to the presence of this analyte in the method blank.
2. The value reported is less than or equal to 3x the value in the method blank. It is the policy of NJDEP-DPFSR to negate the reported value due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
3. The value reported is greater than three (3) but less than ten (10) times the value in the trip/field blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to the trip/field blank contamination.
4. The reported value was qualified due to poor field duplicate precision with unknown direction of bias.
5. The reported result was greater than the MDL but less than the RL and therefore was estimated.
6. The reported value was qualified because the MS/MSD spike recovery was greater than 125% for metals.
7. The reported value was qualified because the MS/MSD spike recovery was less than 75% for metals.

Aqueous Target Analyte Summary Hit List (TAL Metals)

Site Name PPG - North Forest Street PDI
Sampling Date September 9, 2016
Lab Name/ID SGS/Accutest, Dayton, NJ
SDG No JC27321A
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID NFS-FB20160909

Field Sample ID	Lab Sample ID	Analyte	Method Blank (ug/L)	Laboratory Sample Result (ug/L)	Validation Sample Result (ug/L)	RL (ug/L)	Quality Assurance Decision	NJDEP Validation Footnote
NFS-FB20160909	JC27321-1A	ALUMINUM	30.8	46.4B	U	200	Negate	1
NFS-FB20160909	JC27321-1A	BARIUM	U	2.3B	2.3	200	Qualify	4
NFS-FB20160909	JC27321-1A	CALCIUM METAL	U	121B	121	5000	Qualify	4
NFS-FB20160909	JC27321-1A	IRON	U	81.7B	81.7	100	Qualify	4
NFS-FB20160909	JC27321-1A	MAGNESIUM	-91	U	U	5000	Qualify	3
NFS-FB20160909	JC27321-1A	MANGANESE	U	1.0B	1.0	15	Qualify	4
NFS-FB20160909	JC27321-1A	SODIUM	-27	86.3B	86.3	10000	Qualify	3,4
NFS-FB20160909	JC27321-1A	ZINC	U	5.8B	5.8	20	Qualify	4

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

NJDEP Laboratory Footnote

1. The value reported is less than or equal to 3x the value in the method blank. It is the policy of NJDEP-DPFSR to negate the reported value due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.

2. The value reported is greater than three (3) but less than ten (10) times the value in the method blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to the method blank contamination. The "B" qualifier alerts the end-user to the presence of this analyte in the method blank.
3. The reported value was qualified because of negative instrument drift.
4. The reported result was greater than the MDL but less than the RL and therefore was estimated.

Soil Target Analyte Summary Hit List (VOCs)

Site Name PPG - North Forest Street PDI
Sampling Date September 9, 2016
Lab Name/ID SGS/Accutest, Dayton, NJ
SDG No JC27321A
Sample Matrix Soil
Trip Blank ID NA
Field Blank ID NFS--FB20160909

Field Sample ID	Lab Sample ID	Analyte	Method Blank (ug/kg)	Laboratory Sample Result (ug/kg)	Validation Sample Result (ug/kg)	RL (ug/kg)	Quality Assurance Decision	NJDEP Validation Footnote
NFS-PDI-CC12B-0.0-0.5	JC27321-2A	ACETONE	U	15.2	15.2	15		
NFS-PDI-CC12B-0.0-0.5	JC27321-2A	DICHLOROMETHANE	U	2.1J	2.1	7.3	Qualify	1
NFS-PDI-CC12B-10.0-10.5	JC27321-3A	1,4-DICHLOROBENZENE	U	0.44J	0.44	0.97	Qualify	1
NFS-PDI-CC12B-10.0-10.5	JC27321-3A	DICHLOROMETHANE	U	1.9J	1.9	4.8	Qualify	1
NFS-PDI-CC12B-12.0-12.5	JC27321-4A	DICHLOROMETHANE	U	1.5J	1.5	4.5	Qualify	1
NFS-PDI-CC12B-12.0-12.5	JC27321-4A	METHYL-TERT-BUTYL ETHER	U	0.42J	0.42	0.90	Qualify	1
NFS-PDI-CC12B-12.0-12.5	JC27321-4A	TETRACHLOROETHENE	U	0.40J	0.40	1.8	Qualify	1
NFS-PDI-CC12B-14.0-14.5	JC27321-5A	DICHLOROMETHANE	U	2.2J	2.2	6.0	Qualify	1
NFS-PDI-CC12B-14.0-14.5	JC27321-5A	METHYL-TERT-BUTYL ETHER	U	0.66J	0.66	1.2	Qualify	1
NFS-PDI-CC12B-14.0-14.5	JC27321-5A	TETRACHLOROETHENE	U	0.65J	0.65	2.4	Qualify	1
NFS-PDI-CC12B-16.0-16.5	JC27321-6A	1,4-DICHLOROBENZENE	U	0.27J	0.27	1.0	Qualify	1
NFS-PDI-CC12B-16.0-16.5	JC27321-6A	CARBON DISULFIDE	U	0.49J	0.49	2.1	Qualify	1
NFS-PDI-CC12B-16.0-16.5	JC27321-6A	DICHLOROMETHANE	U	2.0J	2.0	5.1	Qualify	1
NFS-PDI-CC12B-16.0-16.5	JC27321-6A	METHYL-TERT-BUTYL ETHER	U	0.64J	0.64	1.0	Qualify	1
NFS-PDI-CC12B-16.0-16.5	JC27321-6A	TETRACHLOROETHENE	U	0.76J	0.76	2.1	Qualify	1
NFS-PDI-CC12B-18.0-18.5	JC27321-7A	DICHLOROMETHANE	U	1.6J	1.6	4.3	Qualify	1
NFS-PDI-CC12B-18.0-18.5	JC27321-7A	METHYL-TERT-BUTYL ETHER	U	0.60J	0.60	0.87	Qualify	1

Field Sample ID	Lab Sample ID	Analyte	Method Blank (ug/kg)	Laboratory Sample Result (ug/kg)	Validation Sample Result (ug/kg)	RL (ug/kg)	Quality Assurance Decision	NJDEP Validation Footnote
NFS-PDI-CC12B-18.0-18.5	JC27321-7A	TETRACHLOROETHENE	U	0.70J	0.70	1.7	Qualify	1
NFS-PDI-CC12B-2.0-2.5	JC27321-8A	DICHLOROMETHANE	U	1.7J	1.7	7.6	Qualify	1
NFS-PDI-CC12B-20.0-20.5	JC27321-9A	1,2,4-TRICHLOROBENZENE	U	0.44J	0.44	5.2	Qualify	1
NFS-PDI-CC12B-20.0-20.5	JC27321-9A	DICHLOROMETHANE	U	1.8J	1.8	5.2	Qualify	1
NFS-PDI-CC12B-20.0-20.5	JC27321-9A	METHYL-TERT-BUTYL ETHER	U	0.98J	0.98	1.0	Qualify	1
NFS-PDI-CC12B-4.0-4.5	JC27321-10A	2-BUTANONE (MEK)	U	12.0	12.0	12		
NFS-PDI-CC12B-4.0-4.5	JC27321-10A	ACETONE	U	52.9	52.9	12		
NFS-PDI-CC12B-4.0-4.5	JC27321-10A	BENZENE	U	0.52J	0.52	0.61	Qualify	1
NFS-PDI-CC12B-4.0-4.5	JC27321-10A	CARBON DISULFIDE	U	0.43J	0.43	2.4	Qualify	1
NFS-PDI-CC12B-4.0-4.5	JC27321-10A	CHLOROBENZENE	U	5.2	5.2	2.4		
NFS-PDI-CC12B-4.0-4.5	JC27321-10A	TOLUENE	U	0.23J	0.23	1.2	Qualify	1
NFS-PDI-CC12B-4.0-4.5	JC27321-10A	VINYL CHLORIDE	U	0.95J	0.95	2.4	Qualify	1
NFS-PDI-CC12B-4.0-4.5X	JC27321-11A	2-BUTANONE (MEK)	U	10.7J	10.7	12	Qualify	1
NFS-PDI-CC12B-4.0-4.5X	JC27321-11A	ACETONE	U	43.2	43.2	12		
NFS-PDI-CC12B-4.0-4.5X	JC27321-11A	CARBON DISULFIDE	U	0.36J	0.36	2.3	Qualify	1
NFS-PDI-CC12B-6.0-6.5	JC27321-12A	1,4-DICHLOROBENZENE	U	0.92J	0.92	1.1	Qualify	1
NFS-PDI-CC12B-6.0-6.5	JC27321-12A	DICHLOROMETHANE	U	1.9J	1.9	5.5	Qualify	1
NFS-PDI-CC12B-6.0-6.5	JC27321-12A	M-DICHLOROBENZENE	U	0.26J	0.26	1.1	Qualify	1
NFS-PDI-CC12B-8.0-8.5	JC27321-13A	1,4-DICHLOROBENZENE	U	0.27J	0.27	1.0	Qualify	1
NFS-PDI-CC12B-8.0-8.5	JC27321-13A	CHLOROBENZENE	U	0.22J	0.22	2.0	Qualify	1
NFS-PDI-CC12B-8.0-8.5	JC27321-13A	DICHLOROMETHANE	U	1.8J	1.8	5.1	Qualify	1
NFS-PDI-CC12B-8.0-8.5	JC27321-13A	METHYL-TERT-BUTYL ETHER	U	0.71J	0.71	1.0	Qualify	1
NFS-PDI-CC12B-8.0-8.5	JC27321-13A	TETRACHLOROETHENE	U	0.79J	0.79	2.0	Qualify	1
NFS-PDI-CC12B-8.5-9.0	JC27321-14A	DICHLOROMETHANE	U	1.9J	1.9	4.9	Qualify	1

Field Sample ID	Lab Sample ID	Analyte	Method Blank (ug/kg)	Laboratory Sample Result (ug/kg)	Validation Sample Result (ug/kg)	RL (ug/kg)	Quality Assurance Decision	NJDEP Validation Footnote
NFS-PDI-CC12B-8.5-9.0	JC27321-14A	METHYL-TERT-BUTYL ETHER	U	0.62J	0.62	0.98	Qualify	1
NFS-PDI-CC12B-8.5-9.0	JC27321-14A	TETRACHLOROETHENE	U	0.47J	0.47	2.0	Qualify	1

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

NJDEP Laboratory Footnote

1. The reported result was greater than the MDL but less than the RL and therefore was estimated.

Soil Target Analyte Summary Hit List (SVOCs)

Site Name PPG - North Forest Street PDI
Sampling Date September 9, 2016
Lab Name/ID SGS/Accutest, Dayton, NJ
SDG No JC27321A
Sample Matrix Soil
Trip Blank ID NA
Field Blank ID NFS-FB20160909

Field Sample ID	Lab Sample ID	Analyte	Method Blank (ug/kg)	Laboratory Sample Result (ug/kg)	Validation Sample Result (ug/kg)	RL (ug/kg)	Quality Assurance Decision	NJDEP Validation Footnote
NFS-PDI-CC12B-0.0-0.5	JC27321-2A	ACENAPHTHYLENE	U	152J	152	200	Qualify	2
NFS-PDI-CC12B-0.0-0.5	JC27321-2A	ANTHRACENE	U	133J	133	200	Qualify	2
NFS-PDI-CC12B-0.0-0.5	JC27321-2A	BENZO(A)ANTHRACENE	U	377	377	200		
NFS-PDI-CC12B-0.0-0.5	JC27321-2A	BENZO(A)PYRENE	U	488	488	200		
NFS-PDI-CC12B-0.0-0.5	JC27321-2A	BENZO(B)FLUORANTHENE	U	680	680	200		
NFS-PDI-CC12B-0.0-0.5	JC27321-2A	BENZO(G,H,I)PERYLENE	U	447	447	200		
NFS-PDI-CC12B-0.0-0.5	JC27321-2A	BENZO(K)FLUORANTHENE	U	241	241	200		
NFS-PDI-CC12B-0.0-0.5	JC27321-2A	BIS(2-ETHYLHEXYL)PHTHALATE	U	342J	342	390	Qualify	2
NFS-PDI-CC12B-0.0-0.5	JC27321-2A	CARBAZOLE	U	78.1J	78.1	390	Qualify	2
NFS-PDI-CC12B-0.0-0.5	JC27321-2A	CHRYSENE	U	516	516	200		
NFS-PDI-CC12B-0.0-0.5	JC27321-2A	DIBENZO(A,H)ANTHRACENE	U	116J	116	200	Qualify	2
NFS-PDI-CC12B-0.0-0.5	JC27321-2A	FLUORANTHENE	U	936	936	200		
NFS-PDI-CC12B-0.0-0.5	JC27321-2A	INDENO(1,2,3-CD)PYRENE	U	424	424	200		
NFS-PDI-CC12B-0.0-0.5	JC27321-2A	PHENANTHRENE	U	449	449	200		
NFS-PDI-CC12B-0.0-0.5	JC27321-2A	PYRENE	U	727	727	200		

Field Sample ID	Lab Sample ID	Analyte	Method Blank (ug/kg)	Laboratory Sample Result (ug/kg)	Validation Sample Result (ug/kg)	RL (ug/kg)	Quality Assurance Decision	NJDEP Validation Footnote
NFS-PDI-CC12B-10.0-10.5	JC27321-3A	1-1'-BIPHENYL	U	39.0J	39.0	69	Qualify	2
NFS-PDI-CC12B-10.0-10.5	JC27321-3A	2-METHYLNAPHTHALENE	U	94.8	94.8	69		
NFS-PDI-CC12B-10.0-10.5	JC27321-3A	ACENAPHTHENE	U	218	218	35		
NFS-PDI-CC12B-10.0-10.5	JC27321-3A	ACENAPHTHYLENE	U	72.0	72.0	35		
NFS-PDI-CC12B-10.0-10.5	JC27321-3A	ANTHRACENE	U	509	509	35		
NFS-PDI-CC12B-10.0-10.5	JC27321-3A	BENZO(A)ANTHRACENE	U	833	833	35		
NFS-PDI-CC12B-10.0-10.5	JC27321-3A	BENZO(A)PYRENE	U	772	772	35		
NFS-PDI-CC12B-10.0-10.5	JC27321-3A	BENZO(B)FLUORANTHENE	U	969	969	35		
NFS-PDI-CC12B-10.0-10.5	JC27321-3A	BENZO(G,H,I)PERYLENE	U	423	423	35		
NFS-PDI-CC12B-10.0-10.5	JC27321-3A	BENZO(K)FLUORANTHENE	U	336	336	35		
NFS-PDI-CC12B-10.0-10.5	JC27321-3A	CARBAZOLE	U	188	188	69		
NFS-PDI-CC12B-10.0-10.5	JC27321-3A	CHRYSENE	U	811	811	35		
NFS-PDI-CC12B-10.0-10.5	JC27321-3A	DIBENZO(A,H)ANTHRACENE	U	134	134	35		
NFS-PDI-CC12B-10.0-10.5	JC27321-3A	DIBENZOFURAN	U	226	226	69		
NFS-PDI-CC12B-10.0-10.5	JC27321-3A	FLUORANTHENE	U	2000	2000	35		
NFS-PDI-CC12B-10.0-10.5	JC27321-3A	FLUORENE	U	324	324	35		
NFS-PDI-CC12B-10.0-10.5	JC27321-3A	INDENO(1,2,3-CD)PYRENE	U	508	508	35		
NFS-PDI-CC12B-10.0-10.5	JC27321-3A	NAPHTHALENE	U	97.1	97.1	35		
NFS-PDI-CC12B-10.0-10.5	JC27321-3A	PHENANTHRENE	U	2050	2050	35		
NFS-PDI-CC12B-10.0-10.5	JC27321-3A	PYRENE	U	1470	1470	35		
NFS-PDI-CC12B-12.0-12.5	JC27321-4A	ANTHRACENE	U	33.6J	33.6	36	Qualify	2
NFS-PDI-CC12B-12.0-12.5	JC27321-4A	BENZO(A)ANTHRACENE	U	64.6	64.6	36		
NFS-PDI-CC12B-12.0-12.5	JC27321-4A	BENZO(A)PYRENE	U	64.9	64.9	36		
NFS-PDI-CC12B-12.0-12.5	JC27321-4A	BENZO(B)FLUORANTHENE	U	76.8	76.8	36		

Field Sample ID	Lab Sample ID	Analyte	Method Blank (ug/kg)	Laboratory Sample Result (ug/kg)	Validation Sample Result (ug/kg)	RL (ug/kg)	Quality Assurance Decision	NJDEP Validation Footnote
NFS-PDI-CC12B-12.0-12.5	JC27321-4A	BENZO(G,H,I)PERYLENE	U	34.9J	34.9	36	Qualify	2
NFS-PDI-CC12B-12.0-12.5	JC27321-4A	BENZO(K)FLUORANTHENE	U	32.5J	32.5	36	Qualify	2
NFS-PDI-CC12B-12.0-12.5	JC27321-4A	CHRYSENE	U	62.5	62.5	36		
NFS-PDI-CC12B-12.0-12.5	JC27321-4A	FLUORANTHENE	U	171	171	36		
NFS-PDI-CC12B-12.0-12.5	JC27321-4A	FLUORENE	U	21.0J	21.0	36	Qualify	2
NFS-PDI-CC12B-12.0-12.5	JC27321-4A	INDENO(1,2,3-CD)PYRENE	U	40.5	40.5	36		
NFS-PDI-CC12B-12.0-12.5	JC27321-4A	PHENANTHRENE	U	152	152	36		
NFS-PDI-CC12B-12.0-12.5	JC27321-4A	PYRENE	U	113	113	36		
NFS-PDI-CC12B-2.0-2.5	JC27321-8A	1-1'-BIPHENYL	U	94.6	94.6	77		
NFS-PDI-CC12B-2.0-2.5	JC27321-8A	2-METHYLNAPHTHALENE	U	397	397	77		
NFS-PDI-CC12B-2.0-2.5	JC27321-8A	ACENAPHTHENE	U	481	481	39		
NFS-PDI-CC12B-2.0-2.5	JC27321-8A	ACENAPHTHYLENE	U	155	155	39		
NFS-PDI-CC12B-2.0-2.5	JC27321-8A	ACETOPHENONE	U	31.4J	31.4	190	Qualify	2
NFS-PDI-CC12B-2.0-2.5	JC27321-8A	ANTHRACENE	U	1210	1210	39		
NFS-PDI-CC12B-2.0-2.5	JC27321-8A	BENZALDEHYDE	U	81.3J	81.3	190	Qualify	2
NFS-PDI-CC12B-2.0-2.5	JC27321-8A	BENZO(A)ANTHRACENE	U	1930	1930	39		
NFS-PDI-CC12B-2.0-2.5	JC27321-8A	BENZO(A)PYRENE	U	1610	1610	39		
NFS-PDI-CC12B-2.0-2.5	JC27321-8A	BENZO(B)FLUORANTHENE	U	2120	2120	39		
NFS-PDI-CC12B-2.0-2.5	JC27321-8A	BENZO(G,H,I)PERYLENE	U	896	896	39		
NFS-PDI-CC12B-2.0-2.5	JC27321-8A	BENZO(K)FLUORANTHENE	U	742	742	39		
NFS-PDI-CC12B-2.0-2.5	JC27321-8A	CARBAZOLE	U	533	533	77		
NFS-PDI-CC12B-2.0-2.5	JC27321-8A	CHRYSENE	U	2010	2010	39		
NFS-PDI-CC12B-2.0-2.5	JC27321-8A	DIBENZO(A,H)ANTHRACENE	U	320	320	39		
NFS-PDI-CC12B-2.0-2.5	JC27321-8A	DIBENZOFURAN	U	498	498	77		

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NFS-PDI-CC12B-2.0-2.5	JC27321-8A	FLUORANTHENE	U	4500	4500	190		
NFS-PDI-CC12B-2.0-2.5	JC27321-8A	FLUORENE	U	628	628	39		
NFS-PDI-CC12B-2.0-2.5	JC27321-8A	INDENO(1,2,3-CD)PYRENE	U	1030	1030	39		
NFS-PDI-CC12B-2.0-2.5	JC27321-8A	NAPHTHALENE	U	784	784	39		
NFS-PDI-CC12B-2.0-2.5	JC27321-8A	NITROBENZENE	U	26.9J	26.9	77	Qualify	2
NFS-PDI-CC12B-2.0-2.5	JC27321-8A	PHENANTHRENE	U	5630	5630	190		
NFS-PDI-CC12B-2.0-2.5	JC27321-8A	PYRENE	U	3090	3090	39		
NFS-PDI-CC12B-20.0-20.5	JC27321-9A	NAPHTHALENE	U	23.5J	23.5	39	Qualify	2
NFS-PDI-CC12B-4.0-4.5	JC27321-10A	1-1'-BIPHENYL	U	193	193	85	Qualify	1
NFS-PDI-CC12B-4.0-4.5	JC27321-10A	2-METHYLNAPHTHALENE	U	638	638	85	Qualify	1
NFS-PDI-CC12B-4.0-4.5	JC27321-10A	3+4-METHYLPHENOL	U	86.0	86.0	85		
NFS-PDI-CC12B-4.0-4.5	JC27321-10A	ACENAPHTHENE	U	1620	1620	42	Qualify	1
NFS-PDI-CC12B-4.0-4.5	JC27321-10A	ACENAPHTHYLENE	U	153	153	42	Qualify	1
NFS-PDI-CC12B-4.0-4.5	JC27321-10A	ANTHRACENE	U	2770	2770	42	Qualify	1
NFS-PDI-CC12B-4.0-4.5	JC27321-10A	BENZALDEHYDE	U	83.2J	83.2	210	Qualify	2
NFS-PDI-CC12B-4.0-4.5	JC27321-10A	BENZO(A)ANTHRACENE	U	3900	3900	42	Qualify	1
NFS-PDI-CC12B-4.0-4.5	JC27321-10A	BENZO(A)PYRENE	U	3200	3200	42	Qualify	1
NFS-PDI-CC12B-4.0-4.5	JC27321-10A	BENZO(B)FLUORANTHENE	U	3700	3700	42	Qualify	1
NFS-PDI-CC12B-4.0-4.5	JC27321-10A	BENZO(G,H,I)PERYLENE	U	1560	1560	42	Qualify	1
NFS-PDI-CC12B-4.0-4.5	JC27321-10A	BENZO(K)FLUORANTHENE	U	1210	1210	42	Qualify	1
NFS-PDI-CC12B-4.0-4.5	JC27321-10A	CARBAZOLE	U	1400	1400	85	Qualify	1
NFS-PDI-CC12B-4.0-4.5	JC27321-10A	CHRYSENE	U	3480	3480	42	Qualify	1
NFS-PDI-CC12B-4.0-4.5	JC27321-10A	DIBENZO(A,H)ANTHRACENE	U	560	560	42	Qualify	1
NFS-PDI-CC12B-4.0-4.5	JC27321-10A	DIBENZOFURAN	U	1390	1390	85	Qualify	1

Field Sample ID	Lab Sample ID	Analyte	Method Blank (ug/kg)	Laboratory Sample Result (ug/kg)	Validation Sample Result (ug/kg)	RL (ug/kg)	Quality Assurance Decision	NJDEP Validation Footnote
NFS-PDI-CC12B-4.0-4.5	JC27321-10A	FLUORANTHENE	U	10100	10100	210	Qualify	1
NFS-PDI-CC12B-4.0-4.5	JC27321-10A	FLUORENE	U	1620	1620	42	Qualify	1
NFS-PDI-CC12B-4.0-4.5	JC27321-10A	INDENO(1,2,3-CD)PYRENE	U	1890	1890	42	Qualify	1
NFS-PDI-CC12B-4.0-4.5	JC27321-10A	NAPHTHALENE	U	899	899	42	Qualify	1
NFS-PDI-CC12B-4.0-4.5	JC27321-10A	PHENANTHRENE	U	12400	12400	210	Qualify	1
NFS-PDI-CC12B-4.0-4.5	JC27321-10A	PYRENE	U	7950	7950	210	Qualify	1
NFS-PDI-CC12B-4.0-4.5X	JC27321-11A	1-1'-BIPHENYL	U	28.0J	28.0	85	Qualify	1,2
NFS-PDI-CC12B-4.0-4.5X	JC27321-11A	2-METHYLNAPHTHALENE	U	89.8	89.8	85	Qualify	1
NFS-PDI-CC12B-4.0-4.5X	JC27321-11A	ACENAPHTHENE	U	175	175	42	Qualify	1
NFS-PDI-CC12B-4.0-4.5X	JC27321-11A	ACENAPHTHYLENE	U	60.3	60.3	42	Qualify	1
NFS-PDI-CC12B-4.0-4.5X	JC27321-11A	ANTHRACENE	U	331	331	42	Qualify	1
NFS-PDI-CC12B-4.0-4.5X	JC27321-11A	BENZALDEHYDE	U	63.0J	63.0	210	Qualify	2
NFS-PDI-CC12B-4.0-4.5X	JC27321-11A	BENZO(A)ANTHRACENE	U	689	689	42	Qualify	1
NFS-PDI-CC12B-4.0-4.5X	JC27321-11A	BENZO(A)PYRENE	U	668	668	42	Qualify	1
NFS-PDI-CC12B-4.0-4.5X	JC27321-11A	BENZO(B)FLUORANTHENE	U	809	809	42	Qualify	1
NFS-PDI-CC12B-4.0-4.5X	JC27321-11A	BENZO(G,H,I)PERYLENE	U	358	358	42	Qualify	1
NFS-PDI-CC12B-4.0-4.5X	JC27321-11A	BENZO(K)FLUORANTHENE	U	270	270	42	Qualify	1
NFS-PDI-CC12B-4.0-4.5X	JC27321-11A	CARBAZOLE	U	117	117	85	Qualify	1
NFS-PDI-CC12B-4.0-4.5X	JC27321-11A	CHRYSENE	U	698	698	42	Qualify	1
NFS-PDI-CC12B-4.0-4.5X	JC27321-11A	DIBENZO(A,H)ANTHRACENE	U	91.9	91.9	42	Qualify	1
NFS-PDI-CC12B-4.0-4.5X	JC27321-11A	DIBENZOFURAN	U	105	105	85	Qualify	1
NFS-PDI-CC12B-4.0-4.5X	JC27321-11A	FLUORANTHENE	U	1450	1450	42	Qualify	1
NFS-PDI-CC12B-4.0-4.5X	JC27321-11A	FLUORENE	U	151	151	42	Qualify	1
NFS-PDI-CC12B-4.0-4.5X	JC27321-11A	INDENO(1,2,3-CD)PYRENE	U	412	412	42	Qualify	1

Field Sample ID	Lab Sample ID	Analyte	Method Blank (ug/kg)	Laboratory Sample Result (ug/kg)	Validation Sample Result (ug/kg)	RL (ug/kg)	Quality Assurance Decision	NJDEP Validation Footnote
NFS-PDI-CC12B-4.0-4.5X	JC27321-11A	NAPHTHALENE	U	165	165	42	Qualify	1
NFS-PDI-CC12B-4.0-4.5X	JC27321-11A	PHENANTHRENE	U	1210	1210	42	Qualify	1
NFS-PDI-CC12B-4.0-4.5X	JC27321-11A	PYRENE	U	1310	1310	42	Qualify	1
NFS-PDI-CC12B-6.0-6.5	JC27321-12A	NAPHTHALENE	U	23.6J	23.6	41	Qualify	2

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

NJDEP Laboratory Footnote

1. The reported values were estimated due to poor field duplicate precision with unknown direction of bias.
2. The reported result was greater than the MDL but less than the RL and therefore was estimated.

Attachment B

Data Validation Report Form

Client Name: PPG Industries		Project Number: 60314351.GA.DE.PDI.NFS			
Site Location: PPG - North Forest Street PDI, Jersey City, NJ		Project Manager: Aimee Ruitter			
Laboratory: SGS/Accutest, Dayton, NJ		Type of Validation: Limited			
Laboratory Job No: JC27321A		Date Checked: 10/27/2016			
Validator: Charlene Livingston Flint		Peer: Kristin Rutherford			
ITEM	YES	NO	N/A	COMMENTS	
Sample results included?	X				
Reporting Limits met project requirements?	X				
Field I.D. included?	X				
Laboratory I.D. included?	X				
Did data package sample IDs match sample IDs on COC?	X				
Did electronic data deliverable (EDD) sample IDs match COC sample IDs?	X				
Did data package sample IDs match electronic data deliverable (EDD) sample IDs?	X				
Sample matrix included?	X				
Sample receipt temperature 2-6°C?	X			5.4 C	
Signed COCs included?	X				
Date of sample collection included?	X				
Date of sample digestion included?	X				
Date of analysis included?	X				
Holding time met QC criteria? (Metals -180 days from sample collection; Mercury - 28 days from sample collection. If HT exceeded by 10 days R all results.	X				
Method reference included?	X				
Laboratory Case Narrative included?	X				
Definitions: MDL - Method Detection Limit; %R - Percent Recovery; RL - Reporting Limit; RPD - Relative Percent Difference; RSD - Relative Standard Deviation :Corr - Correlation Coefficient.					

ITEM	YES	NO	N/A	COMMENTS
Sample dilutions?		X		
Initial calibration documentation included in lab package?			X	N/A for Limited Validation
1) Calibrate daily or each time instrument is set up.			X	
2) ICP (6010) -Blank plus 1 standard?			X	
3) Hg (7470/7471) -Blank plus 5 standards?			X	
Initial Calibration Verification Standard (ICV) for ICP (6010) and Initial Calibration Check Standard (ICCS) for Hg (7470/7471) included in lab package?			X	N/A for Limited Validation
1) Analyzed immediately after initial calibration?			X	
2) %R criteria met? (90-110%)			X	
3) Spot check ICV/ICCS results for several analytes.			X	
Continuing Calibration Verification Standard (CCV) for ICP (6010) and Calibration Check Standard (CCS) for Hg (7470/7471) included in Lab Package?			X	N/A for Limited Validation
1) Analyzed immediately after each ICV/ICC/CB and after every 10 samples?			X	
2) CCS and CCV from independent source and at mid- level of calibration curve.			X	
3) %R criteria met? (90-110%R).			X	
4) Spot check CCV/CCS results for several analytes.			X	
Low Calibration Standard (CRI) included in Lab Package?			X	N/A for Limited Validation
1) %R criteria met?			X	
Calibration Blanks			X	N/A for Limited Validation
1) Analyzed after daily calibration and after each ICV/ICC/CCV/CCS and after every 10 samples?			X	
2) Absolute value <3xIDL?			X	
Method Blank Included in Lab Package?	X			
1) Method blank analyzed with each preparation batch or every SDG, or 1/20 samples?	X			
2) Method blank analyzed 1/20 samples	X			
3) MB results nondetect?		X		see table below
4) Negative MB result reported?	X			Negative result reported for magnesium and sodium in the Aq MB MP95955.

ITEM	YES	NO	N/A	COMMENTS
Field Blanks/Equipment Blanks Included in Lab Package?	X			NFS--FB20160909
1) FB/EB result non-detect?		X		see table below
ICP Interference Check Sample (ICS) included in Lab Package?			X	N/A for Limited Validation
1) Analyzed at beginning of analytical run?			X	
2) %R criteria met? (80-120%)			X	
3) Spot check accuracy of %Rs			X	
Matrix Spike/Matrix Spike Duplicate Data Included in Lab Package?	X			JC27321-12A
1) MS/MSD %R (75-125%R) and RPD (20%) criteria met?		X		see table below
2) Was a sample spiked at the frequency of 1/batch or 20 samples?	X			
3) Was the MS performed on a site sample?	X			
4) Was the MS performed on a FB/EB or TB?		X		
Post Digestion Spike			X	N/A for Limited Validation
1) %R criteria met? (75-125%R)			X	
2) Was the spike performed on a FB/EB or TB?			X	
3) Was a sample spiked at the frequency of 1/batch or 20 samples?			X	
Laboratory Duplicate Data Included in Lab Package?		X		
Aqueous - RPD criteria met? (20%)			X	
Soil - RPD criteria met? (35%)			X	
Was a Laboratory Control Sample (LCS) Included in Lab Package?	X			
1) LCS %R criteria met? (80-120%R).	X			
2) Was an LCS analyzed at the frequency of 1/batch or 20 samples?	X			
Serial Dilution			X	N/A for Limited Validation
1) %D (<10%R) criteria met? -			X	
2) Was the frequency 1/batch or 20 samples?			X	
3) Was a site sample used?			X	
4) Was a FB/EB or TB used?			X	

ITEM	YES	NO	N/A	COMMENTS
5) Spot check accuracy of %Ds.			X	
Field Duplicate Data included in Lab Package?	X			NFS-PDI-CC12B-4.0-4.5 and NFS-PDI-CC12B-4.0-4.5X (JC27321-10A & -11A)
Aqueous - RPD criteria met? (20%)			X	
Soil - RPD criteria met? (35%)		X		See table below
Percent Solids data included in Lab Package?	X			
1) % Solids criteria (Reg 2 criteria) met? (>/=50%)	X			
Chromium result greater than corresponding hexavalent chromium result where applicable?	X			Hexavalent chromium reported in JC27321_R_T

Blanks

Analyte	Result	3X	10X	Actions	Associated Samples
Soil Method Blank MP95954	(mg/kg)	(mg/kg)	(mg/kg)		
Aluminum	7.4	22.2	74	OK, >10X MB	All soil samples
Calcium	14.9	44.7	149	OK, >10X MB	All soil samples
Chromium	0.15	0.45	1.5	OK, >10X MB	All soil samples
Copper	0.21	0.63	2.1	OK, >10X MB	All soil samples
Iron	4.3	12.9	43	see EB actions	All soil samples
Manganese	0.13	0.39	1.3	OK, >10X MB	All soil samples
Nickel	0.15	0.45	1.5	OK, >10X MB	All soil samples
Sodium	6.5	19.5	65	see EB actions	All soil samples
Zinc	0.44	1.32	4.4	OK, >10X MB	All soil samples
Mercury	0.013	0.039	0.13	OK, >10X MB	NFS-PDI-CC12B-0.0-0.5 (JC27321-2A) NFS-PDI-CC12B-2.0-2.5 (JC27321-8A) NFS-PDI-CC12B-4.0-4.5 (JC27321-10A) NFS-PDI-CC12B-4.0-4.5X (JC27321-11A)
Mercury	0.013	0.039	0.13	>3x but <10X MB Estimate (JB)	NFS-PDI-CC12B-6.0-6.5 (JC27321-12A)
Mercury	0.013	0.039	0.13	<3X MB, Negate (UB)	NFS-PDI-CC12B-10.0-10.5 (JC27321-3A) NFS-PDI-CC12B-12.0-12.5 (JC27321-4A) NFS-PDI-CC12B-14.0-14.5 (JC27321-5A) NFS-PDI-CC12B-16.0-16.5 (JC27321-6A) NFS-PDI-CC12B-18.0-18.5 (JC27321-7A) NFS-PDI-CC12B-20.0-20.5 (JC27321-9A)

Analyte	Result	3X	10X	Actions	Associated Samples
					NFS-PDI-CC12B-8.0-8.5 (JC27321-13A) NFS-PDI-CC12B-8.5-9.0 (JC27321-14A)
Aqueous Method Blank	(ug/l)	(ug/l)	(ug/l)		
Aluminum	30.8	92.4	308	<3X MB, Negate (UB)	NFS-FB20160909
Magnesium	-91	-273	-910	ND, qualify (UJ) for negative drift	NFS-FB20160909
Sodium	-27		-270	<10X negative drift, Estimate (J)	NFS-FB20160909

Analyte	Result	Converted Result*	3X	10X	Actions	Associated Samples
Equipment Blank	(ug/l)	(mg/kg)	(mg/kg)	(mg/kg)		
Calcium	121	12.1	36.3	121	see MB actions	All soil samples
Zinc	5.8	0.58	1.74	5.8	OK, >10X EB	All soil samples
Barium	2.3	0.23	0.69	2.3	OK, >10X EB	All soil samples
Iron	81.7	8.17	24.51	81.7	OK, >10X EB	All soil samples
Sodium	86.3	8.63	25.89	86.3	OK, >10X EB	All soil samples except for NFS-PDI-CC12B-14.0-14.5 (JC27321-5A)
Sodium	86.3	8.63	25.89	86.3	>3x but <10X EB Estimate (J)	NFS-PDI-CC12B-14.0-14.5 (JC27321-5A)
Manganese	1.0	0.10	0.30	1.0	see MB actions	All soil samples

*Note: A nominal weight of 1g and nominal final volume of 0.10L was used to convert aqueous units (ug/L) to soils units (mg/kg) in the absence of a full data deliverable.

Matrix Spikes

Sample ID	Lab ID	Analyte	MS % R	MSD % R	Lower Limit	Upper Limit	RPD	RPD Limit	Actions
NFS-PDI-CC12B-6.0-6.5	JC27321-12A	Aluminum	201.4	176.1	75	125	13.4	20	Qualify (J) pos result in parent sample, bias high
NFS-PDI-CC12B-6.0-6.5	JC27321-12A	Antimony	67.3	66.8	75	125	0.7	20	Qualify (UJ) ND result in parent sample, bias low
NFS-PDI-CC12B-6.0-6.5	JC27321-12A	Iron	184.9	144.6	75	125	24.5	20	SR >4x spike amt. Accept
NFS-PDI-CC12B-6.0-6.5	JC27321-12A	Manganese	75.9	72.3	75	125	4.9	20	Qualify (J) result in parent sample, bias low

Field Duplicates**NFS-PDI-CC12B-4.0-4.5 and NFS-PDI-CC12B-4.0-4.5X**

Analyte	Sample Result (mg/kg)	FD Result (mg/kg)	RL (mg/kg)	RPD (%)	RPD Limit (%)	Abs Diff (mg/kg)	Action
Antimony	0.38	ND	2.6/2.5	200.0	35	0.38	SR<5xRL, ABS Diff <RL, Accept
Mercury	0.88	0.85	0.041/0.042	3.5	35	0.03	OK
Zinc	667	577	6.4/6.1	14.5	35	90	OK
Vanadium	17.9	21.3	6.4/6.1	17.3	35	3.4	OK
Copper	51.5	53.4	3.2/3.1	3.6	35	1.9	OK
Cobalt	6.6	7.5	6.4/6.1	12.8	35	0.9	OK
Chromium	21.8	19.0	1.3/1.2	13.7	35	2.8	OK
Cadmium	0.37	0.28	0.64/0.61	27.7	35	0.09	OK
Beryllium	0.48	0.49	0.26/0.25	2.1	35	0.01	OK
Selenium	0.70	ND	2.6/2.5	200.0	35	0.7	SR<2xRL, ABS Diff <RL, Accept
Arsenic	6.5	6.2	2.6/2.5	4.7	35	0.3	OK
Aluminum	10,500	10,500	64/61	0.0	35	0	OK
Sodium	118	128	1300/1200	8.1	35	10	OK

Analyte	Sample Result (mg/kg)	FD Result (mg/kg)	RL (mg/kg)	RPD (%)	RPD Limit (%)	Abs Diff (mg/kg)	Action
Silver	0.33	0.38	0.64/0.61	14.1	35	0.05	OK
Potassium	1010	1000	1300/1200	1.0	35	10	OK
Nickel	14.4	15.2	5.1/4.9	5.4	35	0.8	OK
Manganese	381	663	1.9/1.8	54.0	35	282	Qualify (J) results in FD pair
Magnesium	2910	3040	640/610	4.4	35	130	OK
Lead	156	156	2.5/2.5	0	35	0	OK
Iron	16,200	25,300	64/61	43.9	35	9100	Qualify (J) results in FD pair
Barium	72.6	85.5	26/25	16.3	35	12.9	OK
Calcium	4870	4950	640/610	1.6	35	80	OK

NC- Not calculated

Percent Solids

Sample ID	Percent Solids (%)	Status
NFS-PDI-CC12B-0.0-0.5	82	ok @50%
NFS-PDI-CC12B-10.0-10.5	90.6	ok @50%
NFS-PDI-CC12B-12.0-12.5	89.7	ok @50%
NFS-PDI-CC12B-14.0-14.5	84	ok @50%
NFS-PDI-CC12B-16.0-16.5	85.5	ok @50%
NFS-PDI-CC12B-18.0-18.5	88.8	ok @50%
NFS-PDI-CC12B-2.0-2.5	84.7	ok @50%
NFS-PDI-CC12B-20.0-20.5	82.9	ok @50%
NFS-PDI-CC12B-4.0-4.5	77.6	ok @50%
NFS-PDI-CC12B-4.0-4.5X	77.6	ok @50%
NFS-PDI-CC12B-6.0-6.5	78.6	ok @50%
NFS-PDI-CC12B-8.0-8.5	82.2	ok @50%
NFS-PDI-CC12B-8.5-9.0	83.5	ok @50%

Client Name: PPG Industries		Project Number: 60314351.GA.DE.PDI.NFS		
Site Location: PPG - North Forest Street PDI, Jersey City, NJ		Project Manager: Aimee Ruiter		
Laboratory: SGS/Accutest, Dayton, NJ		Type of Validation: Limited		
Laboratory Job No: JC27321A		Date Checked: 10/27/2016		
Validator: Charlene Livingston Flint		Peer: Kristin Rutherford		
ITEM	YES	NO	N/A	COMMENTS
Sample results included?	X			
Reporting Limits met project requirements?	X			
Field I.D. included?	X			
Laboratory I.D. included?	X			
Did data package sample IDs match sample IDs on COC?	X			
Did electronic data deliverable (EDD) sample IDs match COC sample IDs?	X			
Did data package sample IDs match electronic data deliverable (EDD) sample IDs?	X			
Sample matrix included?	X			
Sample receipt temperature 2-6°C?	X			5.4 C
Signed COCs included?	X			
Date of sample collection included?	X			
Date of analysis included?	X			
Holding time met QC criteria? (Metals -180 days from sample collection; Mercury - 28 days from sample collection. If HT exceeded by 10 days R all results.	X			
Method reference included?	X			
Laboratory Case Narrative included?	X			
Definitions: MDL - Method Detection Limit; %R - Percent Recovery; RL - Reporting Limit; RPD - Relative Percent Difference; RSD - Relative Standard Deviation ;Corr - Correlation Coefficient.				

ITEM	YES	NO	N/A	COMMENTS
Sample dilutions?		X		No dilutions
Method Blank Included in Lab Package?	X			
1) Method blank analyzed with each preparation batch?	X			
2) Absolute value should not exceed RL.	X			
Trip Blanks/Field Blanks/Equipment Blanks Included in Lab Package?	X			NFS-FB20160909
1) TB/FB/EB results non-detect?	X			
Surrogate Data Included?	X			
1) Is %R criteria (laboratory criteria) met?	X			
Matrix Spike/Matrix Spike Duplicate Data Included in Lab Package?	X			MS/MSD analyzed on JC27321-12A
1) %R and RPD (laboratory criteria) met?	X			
2) Was the spike concentration at the same concentration as the LCS?	X			
3) Was a sample spiked at the frequency of 1 per 20 samples?	X			
Was a Laboratory Control Sample (LCS) Included in Lab Package?	X			
1) LCS %R criteria met? (laboratory criteria)	X			
2) Was an LCS analyzed at the frequency of 1/batch or 20 samples?	X			
Field Duplicate Data included in Lab Package?	X			NFS-PDI-CC12B-4.0-4.5 and NFS-PDI-CC12B-4.0-4.5X (JC27321-10A/11A)
1) %RPD criteria (Reg 2 criteria) met?	X			See table below. No qualifications made.
Percent Solids data included in Lab Package?	X			
1) %Solids criteria (Reg 2 criteria) met? (>=50%)	X			

Field Duplicates

NFS-PDI-CC12B-4.0-4.5 and NFS-PDI-CC12B-4.0-4.5X

Analyte	Sample Result ug/kg	Qual	Duplicate Result ug/kg	Qual	QL	% RPD	Actions
Toluene	0.23	J	1.2	U	1.2/1.2	135.7	None, one result ND, the other <RL
Chlorobenzene	5.2	J	2.3	U	2.4/2.3	77.3	None, one result ND, the other <RL
Acetone	52.9		43.2		12/12	20.2	OK
Benzene	0.52	J	0.59	U	0.61/0.59	12.6	None, one result ND, the other <RL
Vinyl Chloride	0.95	J	2.3	U	2.4/2.3	83.1	None, one result ND, the other <RL
Carbon Disulfide	0.43	J	0.36	J	2.4/2.3	17.7	OK
2-Butanone	12.0		10.7	J	12.0/12.0	11.5	OK

Percent Solids

Sample ID	Percent Solids (%)	Status
NFS-PDI-CC12B-0.0-0.5	82	ok @50%
NFS-PDI-CC12B-10.0-10.5	90.6	ok @50%
NFS-PDI-CC12B-12.0-12.5	89.7	ok @50%
NFS-PDI-CC12B-14.0-14.5	84	ok @50%
NFS-PDI-CC12B-16.0-16.5	85.5	ok @50%
NFS-PDI-CC12B-18.0-18.5	88.8	ok @50%
NFS-PDI-CC12B-2.0-2.5	84.7	ok @50%
NFS-PDI-CC12B-20.0-20.5	82.9	ok @50%
NFS-PDI-CC12B-4.0-4.5	77.6	ok @50%
NFS-PDI-CC12B-4.0-4.5X	77.6	ok @50%
NFS-PDI-CC12B-6.0-6.5	78.6	ok @50%
NFS-PDI-CC12B-8.0-8.5	82.2	ok @50%
NFS-PDI-CC12B-8.5-9.0	83.5	ok @50%

Client Name: PPG Industries		Project Number: 60314351.GA.DE.PDI.NFS		
Site Location: PPG - North Forest Street PDI, Jersey City, NJ		Project Manager: Aimee Ruitter		
Laboratory: SGS/Accutest, Dayton, NJ		Type of Validation: Limited		
Laboratory Job No: JC27321A		Date Checked: 10/27/2016		
Validator: Charlene Livingston Flint		Peer: Kristin Rutherford		
ITEM	YES	NO	N/A	COMMENTS
Sample results included?	X			
Reporting Limits met project requirements?		X		See nonconformance tables
Field I.D. included?	X			
Laboratory I.D. included?	X			
Did data package sample IDs match sample IDs on COC?	X			
Did electronic data deliverable (EDD) sample IDs match COC sample IDs?	X			
Did data package sample IDs match electronic data deliverable (EDD) sample IDs?	X			
Sample matrix included?	X			
Sample receipt temperature 2-6°C?	X			5.4 C
Signed COCs included?	X			
Date of sample collection included?	X			
Date of sample extraction included?	X			
Date of analysis included?	X			
Holding time to analysis met criteria?	X			
Method reference included?	X			
Laboratory Case Narrative included?	X			
Definitions: MDL - Method Detection Limit; %R - Percent Recovery; RL - Reporting Limit; RPD - Relative Percent Difference; RSD - Relative Standard Deviation :Corr - Correlation Coefficient.				

ITEM	YES	NO	N/A	COMMENTS
Sample dilutions?	X			Up to 5X, see table below
Method Blank Included in Lab Package?	X			
1) Method blank analyzed with each preparation batch?	X			
2) Absolute value should not exceed RL.		X		See table below. Aq MB bis(2-ethylhexyl) phthalate >RL, FB ND, no qualification
Trip Blanks/Field Blanks/Equipment Blanks Included in Lab Package?	X			NFS--FB20160909
1) TB/FB/EB results non-detect?	X			
Surrogate Data Included?	X			
1) Is %R criteria (laboratory criteria) met?	X			
Matrix Spike/Matrix Spike Duplicate Data Included in Lab Package?	X			JC27321-12A
1) %R and RPD (laboratory criteria) met?	X			
2) Was the spike concentration at the same concentration as the LCS?	X			Soil LCS @ 50 ug/kg; MS at 54.8 ug/kg.
3) Was a sample spiked at the frequency of 1 per 20 samples?	X			
Was a Laboratory Control Sample (LCS) Included in Lab Package?	X			
1) LCS %R criteria met? (laboratory criteria)	X			
2) Was an LCS analyzed at the frequency of 1/batch or 20 samples?	X			
Field Duplicate Data included in Lab Package?	X			NFS-PDI-CC12B-4.0-4.5 and NFS-PDI-CC12B-4.0-4.5X (JC27321-10A/11A)
1) %RPD criteria (Reg 2 criteria) met?		X		See table below for RPDs >50%.
Percent Solids data included in Lab Package?	X			
1) %Solids criteria (Reg 2 criteria) met? (>=50%)	X			

Method Blank

Analyte	Result	RL	Actions	Associated Samples
Aqueous Method Blank OP97000-MB1	(µg/L)	(µg/L)	(µg/L)	
BIS(2-ETHYLHEXYL)PHTHALATE	2.7	2.0	None, result ND	NFS-FB20160909

Field Duplicates**NFS-PDI-CC12B-4.0-4.5 and NFS-PDI-CC12B-4.0-4.5X**

Analyte	Sample Result ug/kg	Qual	Duplicate Result ug/kg	Qual	QL	% RPD	Actions
CARBAZOLE	1400		117		85	169.1	Qualify (J/UJ) FD pair
PYRENE	7950		1310		210/ 42	143.4	Qualify (J/UJ) FD pair
FLUORANTHENE	10,100		1450		210/ 42	149.8	Qualify (J/UJ) FD pair
PHENANTHRENE	12,400		1210		210/ 42	164.4	Qualify (J/UJ) FD pair
ACENAPHTHENE	1620		175		42	161.0	Qualify (J/UJ) FD pair
FLUORENE	1620		151		42	165.9	Qualify (J/UJ) FD pair
NAPHTHALENE	899		165		42	138.0	Qualify (J/UJ) FD pair
2-METHYLNAPHTHALENE	638		89.8		85	150.6	Qualify (J/UJ) FD pair
1,1'BIPHENYL	193		28.0		85	149.3	Qualify (J/UJ) FD pair
BENZALDEHYDE	83.2		63.0		210	27.6	OK
3,4-METHYLPHENOL	86.0		85	U	85	1.2	OK
ANTHRACENE	2770		331		42	157.3	Qualify (J/UJ) FD pair
DIBENZOFURAN	1390		105		85	171.9	Qualify (J/UJ) FD pair
m-DICHLOROBENZENE	440		170			88.5	Qualify (J/UJ) FD pair
BENZO(G,H,I)PERYLENE	1560		358		42	125.3	Qualify (J/UJ) FD pair
BENZO(A)ANTHRACENE	3900		689		42	139.9	Qualify (J/UJ) FD pair

Analyte	Sample Result ug/kg	Qual	Duplicate Result ug/kg	Qual	QL	% RPD	Actions
DIBENZO(A,H)ANTHRACENE	560		91.9		42	143.6	Qualify (J/UJ) FD pair
BENZO(A)PYRENE	3200		668		42	130.9	Qualify (J/UJ) FD pair
ACENAPHTHYLENE	153		60.3		42	86.9	Qualify (J/UJ) FD pair
BENZO(K)FLUORANTHENE	1210		270		42	127.0	Qualify (J/UJ) FD pair
BENZO(B)FLUORANTHENE	3700		809		42	128.2	Qualify (J/UJ) FD pair
CHRYSENE	3480		698		42	133.2	Qualify (J/UJ) FD pair
INDENO(1,2,3-CD)PYRENE	1890		412		42	128.4	Qualify (J/UJ) FD pair

NC – Not calculated

Percent Solids

Sample ID	Percent Solids (%)	Status
NFS-PDI-CC12B-0.0-0.5	82	ok @50%
NFS-PDI-CC12B-10.0-10.5	90.6	ok @50%
NFS-PDI-CC12B-12.0-12.5	89.7	ok @50%
NFS-PDI-CC12B-14.0-14.5	84	ok @50%
NFS-PDI-CC12B-16.0-16.5	85.5	ok @50%
NFS-PDI-CC12B-18.0-18.5	88.8	ok @50%
NFS-PDI-CC12B-2.0-2.5	84.7	ok @50%
NFS-PDI-CC12B-20.0-20.5	82.9	ok @50%
NFS-PDI-CC12B-4.0-4.5	77.6	ok @50%
NFS-PDI-CC12B-4.0-4.5X	77.6	ok @50%
NFS-PDI-CC12B-6.0-6.5	78.6	ok @50%
NFS-PDI-CC12B-8.0-8.5	82.2	ok @50%
NFS-PDI-CC12B-8.5-9.0	83.5	ok @50%

Sample Dilutions

Sample	Lab ID	Compound	Dilution
NFS-PDI-CC12B-2.0-2.5	JC27321-8A	FLUORANTHENE PHENATHRENE	5X
NFS-PDI-CC12B-4.0-4.5	JC27321-10A	PYRENE FLUORANTHENE PHENATHRENE	5X

SVOC Reporting Limits

Sample ID	Lab ID	Analyte	Result	Detect Flag	Units	DIGWSSL Action Level
NFS-PDI-CC12B-2.0-2.5	JC27321-2A	2,4-DINITROPHENOL	740	N	ug/kg	300

Data Validation Report

Project: PPG - North Forest Street PDI

Laboratory: SGS/Accutest, Dayton, NJ

Laboratory Job No.: JC27483 and JC27483R

Analysis/Method: Hexavalent Chromium SW846 3060A/7196A

Validation Level: Full

Site Location/Address: 70 Carteret Avenue

AECOM Project No: 60314351.GA.DE.PDI.NFS

Prepared by: Charlene Livingston Flint /AECOM Completed on: 10/13/2016

Reviewed by: Mary Kozik /AECOM File Name: JC27483_R_2016-10-13_DVReport-F

Introduction

The data were reviewed in accordance with the FSP-QAPP and the following NJDEP validation Standard Operating Procedure (SOP):

- NJDEP Office of Data Quality SOP 5.A.10, Rev 3 (September 2009), SOP for Analytical Data Validation of Hexavalent Chromium - for USEPA SW-846 Method 3060A, USEPA SW-846 Method 7196A and USEPA SW-846 Method 7199;

The results of quality control data analyzed with site samples were used to assess the overall reliability of the data. The following qualifiers were used to identify data quality issues:

- U: Indicates the analyte was not detected in the sample above the sample reporting limit.
- J: Indicates the result was an estimated value; the associated numerical value was an approximate concentration of the analyte in the sample.
- UJ: Indicates the analyte was not detected above the reporting limit and the reporting limit was approximate.
- UB: The analyte concentration is less than or equal to three (3) times the concentration in the associated method/prep blank. The presence of the analyte in the sample is negated (UB) due to laboratory contamination.
- JB: The analyte concentration is greater than three (3) times, but less than or equal to ten (10) times the concentration in the associated method/prep blank. The presence of that analyte in the sample is considered "real". The concentration is quantitatively qualified (JB) due to method blank contamination.
- R: The sample result was rejected due to serious deficiencies; the presence or absence of the analyte could not be confirmed.
- RA: The sample result was rejected but is still considered usable.

Sample Information

The samples listed below were collected by AECOM on September 13, 2016 as part of the PPG - North Forest Street PDI sampling at 70 Carteret Avenue, Jersey City, New Jersey. Only the samples and parameters listed below were validated.

Field ID	Laboratory ID	Matrix	Fraction
NFS-FB20160913 (Equipment Blank)	JC27483-25	Aqueous	Hexavalent Chromium
NFS-PDI-EE15B-0.0-0.5	JC27483-1	Soil	Hexavalent Chromium
NFS-PDI-EE15B-0.0-0.5	JC27483-1R	Soil	Hexavalent Chromium
NFS-PDI-EE15B-10.0-10.5	JC27483-2	Soil	Hexavalent Chromium
NFS-PDI-EE15B-10.0-10.5	JC27483-2R	Soil	Hexavalent Chromium
NFS-PDI-EE15B-11.5-12.0	JC27483-3	Soil	Hexavalent Chromium
NFS-PDI-EE15B-11.5-12.0	JC27483-3R	Soil	Hexavalent Chromium
NFS-PDI-EE15B-12.0-12.5	JC27483-4	Soil	Hexavalent Chromium
NFS-PDI-EE15B-12.0-12.5	JC27483-4R	Soil	Hexavalent Chromium
NFS-PDI-EE15B-14.0-14.5	JC27483-5	Soil	Hexavalent Chromium
NFS-PDI-EE15B-14.0-14.5	JC27483-5R	Soil	Hexavalent Chromium
NFS-PDI-EE15B-16.0-16.5	JC27483-6	Soil	Hexavalent Chromium
NFS-PDI-EE15B-16.0-16.5	JC27483-6R	Soil	Hexavalent Chromium
NFS-PDI-EE15B-18.0-18.5	JC27483-7	Soil	Hexavalent Chromium
NFS-PDI-EE15B-18.0-18.5	JC27483-7R	Soil	Hexavalent Chromium
NFS-PDI-EE15B-2.0-2.5	JC27483-8	Soil	Hexavalent Chromium
NFS-PDI-EE15B-2.0-2.5	JC27483-8R	Soil	Hexavalent Chromium
NFS-PDI-EE15B-20.0-20.5	JC27483-9	Soil	Hexavalent Chromium
NFS-PDI-EE15B-20.0-20.5	JC27483-9R	Soil	Hexavalent Chromium
NFS-PDI-EE15B-4.0-4.5	JC27483-11	Soil	Hexavalent Chromium
NFS-PDI-EE15B-4.0-4.5	JC27483-11R	Soil	Hexavalent Chromium
NFS-PDI-EE15B-4.0-4.5X (Field Duplicate of NFS-PDI-EE15B-4.0-4.5)	JC27483-10	Soil	Hexavalent Chromium
NFS-PDI-EE15B-4.0-4.5X (Field Duplicate of NFS-PDI-EE15B-4.0-4.5)	JC27483-10R	Soil	Hexavalent Chromium
NFS-PDI-EE15B-6.0-6.5	JC27483-12	Soil	Hexavalent Chromium
NFS-PDI-EE15B-6.0-6.5	JC27483-12R	Soil	Hexavalent Chromium
NFS-PDI-EE15B-8.0-8.5	JC27483-13	Soil	Hexavalent Chromium
NFS-PDI-Z13B-10.0-10.5	JC27483-14	Soil	Hexavalent Chromium
NFS-PDI-Z13B-10.5-11.0	JC27483-15	Soil	Hexavalent Chromium
NFS-PDI-Z13B-11.0-11.5	JC27483-16	Soil	Hexavalent Chromium
NFS-PDI-Z13B-12.0-12.5	JC27483-17	Soil	Hexavalent Chromium
NFS-PDI-Z13B-14.0-14.5	JC27483-18	Soil	Hexavalent Chromium
NFS-PDI-Z13B-16.0-16.5	JC27483-19	Soil	Hexavalent Chromium
NFS-PDI-Z13B-18.0-18.5	JC27483-20	Soil	Hexavalent Chromium
NFS-PDI-Z13B-20.0-20.5	JC27483-21	Soil	Hexavalent Chromium
NFS-PDI-Z13B-4.0-4.5	JC27483-22	Soil	Hexavalent Chromium

Field ID	Laboratory ID	Matrix	Fraction
NFS-PDI-Z13B-6.0-6.5	JC27483-23	Soil	Hexavalent Chromium
NFS-PDI-Z13B-8.0-8.5	JC27483-24	Soil	Hexavalent Chromium

The samples were collected following the procedures detailed in the Work Order for Garfield Avenue Remedial Action (GARA) at 70 Carteret Avenue and the Field Sampling Plan/Quality Assurance Project Plan for Non-Residential and Residential Chromium Sites Hudson County, New Jersey (December 2011).

General Comments

The data package was complete. The sample ID listed on the chain-of-custody for JC 27483-10, NFS-PDI-EE15B-4.0-4.0X was corrected to NFS-PDI-EE15B-4.0-4.5X after submission of samples to the laboratory. Quality control (QC) issues identified during validation are discussed below. Refer to the Target Analyte Summary Hit(s) in Attachment A for a listing of all detected results, qualified results, and associated qualifications, where applicable. The

MS Results

Two matrix spike (MS) samples, NFS-PDI-EE15B-12.0-12.5 (JC27483-4) and NFS-PDI-Z13B-11.0-11.5 (JC27483-16), were analyzed with the samples in this SDG and were used for supporting data quality recommendations. MS samples are associated with field samples using matrix similarities as the primary criteria, then by analytical preparation batch when no matrix match is possible. The following table summarizes each of the MS samples and field samples associated with each, differentiating between those associated by matrix, and those associated by batch.

Spiked Sample	Samples Associated by Matrix	Samples Associated by Batch
NFS-PDI-EE15B-12.0-12.5 (JC27483-4)	NFS-PDI-EE15B-11.5-12.0 (JC27483-3) NFS-PDI-EE15B-14.0-14.5 (JC27483-5) NFS-PDI-EE15B-16.0-16.5 (JC27483-6) NFS-PDI-EE15B-18.0-18.5 (JC27483-7) NFS-PDI-EE15B-8.0-8.5 (JC27483-13)	NFS-PDI-EE15B-0.0-0.5 (JC27483-1) NFS-PDI-EE15B-10.0-10.5 (JC27483-2) NFS-PDI-EE15B-2.0-2.5 (JC27483-8) NFS-PDI-EE15B-20.0-20.5 (JC27483-9) NFS-PDI-EE15B-4.0-4.5X (JC27483-10) NFS-PDI-EE15B-4.0-4.5 (JC27483-11) NFS-PDI-EE15B-6.0-6.5 (JC27483-12)
NFS-PDI-Z13B-11.0-11.5 (JC27483-16)	NFS-PDI-Z13B-12.0-12.5 (JC27483-17) NFS-PDI-Z13B-14.0-14.5 (JC27483-18) NFS-PDI-Z13B-16.0-16.5 (JC27483-19) NFS-PDI-Z13B-18.0-18.5 (JC27483-20) NFS-PDI-Z13B-20.0-20.5 (JC27483-21)	NFS-PDI-Z13B-10.0-10.5 (JC27483-14) NFS-PDI-Z13B-10.5-11.0 (JC27483-15) NFS-PDI-Z13B-4.0-4.5 (JC27483-22) NFS-PDI-Z13B-6.0-6.5 (JC27483-23) NFS-PDI-Z13B-8.0-8.5 (JC27483-24)

MS sample NFS-PDI-EE15B-12.0-12.5 (JC27483-4)

For the MS on sample NFS-PDI-EE15B-12.0-12.5, associated with samples as noted above, the soluble and insoluble MS recoveries from the initial batch were 1.1% and 100.3%, respectively. The soluble MS recovery did not meet quality control (QC) criteria of 75-125%R and exceeded the QC limit. The post digestion spike (PDS) recovery was 99.21%, which met the PDS criteria of 85-115%.

Based on the soluble MS recovery, the MS and associated samples were reanalyzed using Method 7196. The soluble and insoluble matrix spike recoveries were 77.1% and 91.3%, respectively; which met the QC criteria of 75-125%R. The PDS result was 90.4% which met the PDS criteria of 85-115%. No data qualification was required on the basis of spike recoveries for samples reported from

the reanalysis; samples reported from the initial analysis were qualified as estimated (J/UJ) based on the low soluble spike recovery.

MS sample NFS-PDI-Z13B-11.0-11.5 (JC27483-16)

Sample NFS-PDI-Z13B-11.0-11.5, associated with samples as noted above, was selected for the MS analysis and was used for supporting data quality recommendations. The soluble and insoluble MS recoveries were 77.8% and 90.2%, respectively; which met the quality control criteria of 75-125%. The post digestion spike (PDS) recovery was 95.9%, which met the PDS criteria of 85-115%. No data qualification was required on the basis of spike recoveries.

Sample Results

Reported results (flagged B by the laboratory) that were less than the reporting limit (RL), but greater than or equal to the method detection limit (MDL) are approximate values and have been qualified as estimated (J).

Data Quality and Usability

In general, these data appear to be valid and may be used for decision-making purposes. No data were rejected. Qualified results, if applicable, are presented in Attachments A and B.

Sample results reported between the MDL and RL are usable as estimated values with an unknown directional bias.

ATTACHMENTS

Attachment A: Target Analyte Summary Hitlist(s)

Attachment B: Data Validation Report Form

Attachment A

Target Analyte Summary Hitlist(s)

Soil Target Analyte Summary Hit List (Hexavalent Chromium)

Site Name PPG - North Forest Street PDI
Sampling Date September 13, 2016
Lab Name/ID SGS/Accutest, Dayton, NJ
SDG No JC27483 and JC27483R
Sample Matrix Soil
Trip Blank ID NA
Field Blank ID NFS-FB20160913

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
NFS-PDI-EE15B-0.0-0.5	JC27483-1R	CHROMIUM (HEXAVALENT)	U	1.1	1.1	0.42		
NFS-PDI-EE15B-10.0-10.5	JC27483-2R	CHROMIUM (HEXAVALENT)	U	0.58	0.58	0.45		
NFS-PDI-EE15B-12.0-12.5	JC27483-4R	CHROMIUM (HEXAVALENT)	U	0.37B	0.37	0.46	Qualify	1
NFS-PDI-EE15B-14.0-14.5	JC27483-5R	CHROMIUM (HEXAVALENT)	U	0.32B	0.32	0.45	Qualify	1
NFS-PDI-EE15B-2.0-2.5	JC27483-8R	CHROMIUM (HEXAVALENT)	U	0.46	0.46	0.45		
NFS-PDI-EE15B-20.0-20.5	JC27483-9R	CHROMIUM (HEXAVALENT)	U	0.38B	0.38	0.47	Qualify	1
NFS-PDI-EE15B-4.0-4.5X	JC27483-10	CHROMIUM (HEXAVALENT)	U	0.34B	0.34	0.46	Qualify	1,2
NFS-PDI-EE15B-6.0-6.5	JC27483-12R	CHROMIUM (HEXAVALENT)	U	0.72	0.72	0.51		
NFS-PDI-Z13B-10.5-11.0	JC27483-15	CHROMIUM (HEXAVALENT)	U	0.69	0.69	0.49		
NFS-PDI-Z13B-11.0-11.5	JC27483-16	CHROMIUM (HEXAVALENT)	U	0.38B	0.38	0.48	Qualify	1
NFS-PDI-Z13B-12.0-12.5	JC27483-17	CHROMIUM (HEXAVALENT)	U	0.61	0.61	0.54		
NFS-PDI-Z13B-14.0-14.5	JC27483-18	CHROMIUM (HEXAVALENT)	U	0.42B	0.42	0.48	Qualify	1
NFS-PDI-Z13B-18.0-18.5	JC27483-20	CHROMIUM (HEXAVALENT)	U	0.35B	0.35	0.45	Qualify	1
NFS-PDI-Z13B-20.0-20.5	JC27483-21	CHROMIUM (HEXAVALENT)	U	0.71	0.71	0.46		
NFS-PDI-Z13B-4.0-4.5	JC27483-22	CHROMIUM (HEXAVALENT)	U	0.69	0.69	0.53		
NFS-PDI-Z13B-6.0-6.5	JC27483-23	CHROMIUM (HEXAVALENT)	U	0.54	0.54	0.52		
NFS-PDI-Z13B-8.0-8.5	JC27483-24	CHROMIUM (HEXAVALENT)	U	0.53	0.53	0.52		

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

NJDEP Laboratory Footnote

1. The reported result was greater than the MDL but less than the RL and qualified (J) as estimated by the laboratory.
2. The reported result was qualified because the soluble spike was less than 50%.

Attachment B

Data Validation Report Form

Client Name: PPG Industries	Project Number: 60314351.GA.DE.PDI.NFS
Site Location: PPG - North Forest Street PDI, Jersey City, NJ	Project Manager: Aimee Ruiter
Laboratory: SGS/Accutest, Dayton, NJ	Type of Validation: Full
Laboratory Job No: JC27483 and JC27483R	Date Checked: 10/13/2016
Validator: Charlene Livingston Flint	Peer: Mary Kozik

ITEM	YES	NO	N/A	COMMENTS
Sample results included?	X			
Reporting Limits met project requirements?	X			
Field I.D. included?	X			
Laboratory I.D. included?	X			
Did data package sample IDs match sample IDs on COC?	X			
Did electronic data deliverable (EDD) sample IDs match COC sample IDs?	X			
Did data package sample IDs match electronic data deliverable (EDD) sample IDs?	X			
Sample matrix included?	X			
Sample receipt temperature 2-6°C?	X			6.0 °C
Signed COCs included?	X			
Date of sample collection included?	X			
Date of sample digestion included?	X			
Holding time to digestion met criteria? (Soils -30 days from collection to digestion.)	X			
Date of analysis included?	X			
Holding time to analysis met criteria? (Soils -168 hours from digestion to analysis; Aqueous - 24 hours from collection to analysis.)	X			
Method reference included?	X			
Laboratory Case Narrative included?	X			

Definitions: MDL - Method Detection Limit; %R - Percent Recovery; RL - Reporting Limit; RPD - Relative Percent Difference; RSD - Relative Standard Deviation ;Corr - Correlation Coefficient.

ITEM	YES	NO	N/A	COMMENTS
Initial calibration documentation included in lab package?	X			
1) Blank plus 4 standards (7196A) or blank plus 3 standards (7199)	X			
2) Correlation coefficient of =0.995 (7196A) or =0.999 (7199)	X			
3) Calibrate daily or each time instrument is set up.	X			
Calibration Check Standard (CCS) for 7196A and Quality Control Sample (QCS) for 7199 Included in Lab Package?	X			
1) %R criteria met? (90 - 110%)	X			
2) Correct frequency of one per every 10 samples	X			
3) CCS and QCS from independent source and at mid- level of calibration curve	X			
Calibration Blanks	X			
1) Analyzed prior to initial calibration standards and after each CCS/QCS?	X			
2) Absolute value should not exceed MDL.	X			
Method Blank, Field Blanks and/or Equipment Blanks Included in Lab Package?	X			
1) Method blank analyzed with each preparation batch?	X			
2) Absolute value should not exceed MDL.	X			
Eh and pH Data	X			
1) Eh and pH data was included and plotted for all samples?	X			
Soluble Matrix Spike Data Included in Lab Package?	X			2 Sets. JC27483-4,-4R and JC27483-16
1) Soluble Matrix %R criteria met? (75-125%R).		X		JC27483-4 below QC limits. Reanalysis met QC. No qualifications made.
2) Was the spike concentration 40 mg/Kg or twice the sample concentration?	X			Spiked at 45.6, 47.1 and 48.6 mg/kg.
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	X			
Insoluble Matrix Spike Data Included in Lab Package?	X			
1) Insoluble Matrix %R criteria met? (75-125%R).	X			
2) Was the spike concentration around 400 to 800 mg/Kg?		X		Spiked at 1300, 850 and 2540 mg/kg. No impact on data.
3) Was a sample spiked at the frequency of 1 per batch or 20	X			

samples?				
Post Digestion Spike	X			
1) Post Digestion Spike %R criteria met? (85-115%R).	X			
2) Was the spike concentration 40 mg/Kg or twice the sample concentration?	X			
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	X			
Sample Duplicate Data Included in Lab Package?	X			JC27483-4,-4R and JC27483-16
1) RPD criteria met? (RPD < 20%) if both results are $\geq 4x$ RL or control limit of \pm RL if both results are <4xRL.	X			
2) Was a sample duplicate analyzed at the frequency of 1 per batch or 20 samples?	X			
Was a Laboratory Control Sample (LCS) Included in Lab Package?	X			
1) %R criteria met? (80-120%R).	X			
2) Was an LCS analyzed at the frequency of 1/batch or 20 samples?	X			
Were any Field Duplicate samples submitted with this SDG?	X			JC27483-10 & JC27483-11
1) RPD criteria met? (RPD < 20%) if both results are $\geq 4x$ RL or control limit of \pm RL if both results are <4xRL.	X			SR>4xRL, Abs Diff <RL
Were all sample quantitation and reporting requirements met?	X			
1) Were all solid samples reported with percent solids > 50%?	X			
2) Were any samples analyzed or reported with dilutions?		X		
Miscellaneous Items	X			
1) For soils by 7196A, was the pH within a range of 7.0-8.0?	X			
2) For soils by 7199, was the pH within a range of 9.0-9.5?			X	
3) For aqueous by 7196A, was the pH with a range of 1.5-2.5?	X			
4) For soils (3060A), was the digestion temperature 90-95C for at least 60 minutes?	X			
5) For 7199, was each sample injected twice and was the RPD ≤ 20 ?			X	

Matrix Spikes

Sample ID	Lab ID	Analyte	Matrix Spike	% Recovery	Lower Limit	Upper Limit	PDS%	PDS Limit %
NFS-PDI-EE15B-12.0-12.5	JC27483-4	CHROMIUM (HEXAVALENT)	Soluble	1.1	75	125	99.21	85-115
NFS-PDI-EE15B-12.0-12.5	JC27483-4	CHROMIUM (HEXAVALENT)	Insoluble	100.3	75	125		
NFS-PDI-Z13B-11.0-11.5	JC27483-16	CHROMIUM (HEXAVALENT)	Soluble	77.8	75	125	95.9	85-115
NFS-PDI-Z13B-11.0-11.5	JC27483-16	CHROMIUM (HEXAVALENT)	Insoluble	90.2	75	125		
NFS-PDI-EE15B-12.0-12.5	JC27483-4R	CHROMIUM (HEXAVALENT)	Soluble	77.1	75	125	90.4	85-115
NFS-PDI-EE15B-12.0-12.5	JC27483-4R	CHROMIUM (HEXAVALENT)	Insoluble	91.3	75	125		

Lab Duplicates

Sample ID	Lab ID	Analyte	Sample Result	Qual	Duplicate Result	Qual	QL	Units	RPD	Action
NFS-PDI-EE15B-12.0-12.5	JC27483-4	CHROMIUM (HEXAVALENT)	0.32	U	0.46	U	0.46	mg/kg	NC	Both ND, Accept
NFS-PDI-Z13B-11.0-11.5	JC27483-16	CHROMIUM (HEXAVALENT)	0.38	B	0.37	B	0.48	mg/kg	2.7	OK
NFS-PDI-EE15B-12.0-12.5	JC27483-4	CHROMIUM (HEXAVALENT)	0.37	B	0.43	U	0.46	mg/kg	15.0	OK

NC- not calculated

Field Duplicates

Sample ID	Duplicate ID	Analyte	Sample Result	Qual	Duplicate Result	Qual	QL	Units	RPD	Action
NFS-PDI-EE15B-4.0-4.5	NFS-PDI-EE15B-4.0-4.5X	CHROMIUM (HEXAVALENT)	0.34	B	0.46	U	0.46	mg/kg	NC	SR,4xRL, Abs Diff <RL, Accept

NC- not calculated

Percent Solids

Sample ID	Percent Solids (%)	Status
NFS-PDI-Z13B-11.0-11.5	83.6	ok @50%
NFS-PDI-Z13B-12.0-12.5	74.2	ok @50%
NFS-PDI-Z13B-14.0-14.5	83.4	ok @50%
NFS-PDI-Z13B-16.0-16.5	84.2	ok @50%
NFS-PDI-Z13B-18.0-18.5	89	ok @50%
NFS-PDI-Z13B-20.0-20.5	86.5	ok @50%
NFS-PDI-Z13B-4.0-4.5	76.1	ok @50%
NFS-PDI-Z13B-6.0-6.5	76.7	ok @50%
NFS-PDI-Z13B-8.0-8.5	76.5	ok @50%
NFS-PDI-EE15B-0.0-0.5	96.2	ok @50%
NFS-PDI-EE15B-10.0-10.5	88.7	ok @50%
NFS-PDI-EE15B-11.5-12.0	86.3	ok @50%
NFS-PDI-EE15B-12.0-12.5	87.7	ok @50%
NFS-PDI-EE15B-14.0-14.5	88.1	ok @50%
NFS-PDI-EE15B-16.0-16.5	77.2	ok @50%
NFS-PDI-EE15B-18.0-18.5	84.6	ok @50%
NFS-PDI-EE15B-2.0-2.5	89.5	ok @50%
NFS-PDI-EE15B-20.0-20.5	84.7	ok @50%
NFS-PDI-EE15B-4.0-4.5	88.1	ok @50%
NFS-PDI-EE15B-4.0-4.5X	87.7	ok @50%
NFS-PDI-EE15B-6.0-6.5	77.9	ok @50%
NFS-PDI-EE15B-8.0-8.5	86.3	ok @50%
NFS-PDI-Z13B-10.0-10.5	79.6	ok @50%
NFS-PDI-Z13B-10.5-11.0	82.1	ok @50%

SDG#: JC27483/ Method 7196

Batch: GN52298

Cr+6 ICAL 9/20/16

Soil

(p. 108 of data pkg)

x - concentration	y - response
0	0
0.01	0.009
0.05	0.041
0.1	0.085
0.3	0.251
0.5	0.412
0.8	0.669
1	0.834

(p. 108 of data pkg)

AECOM Calculated Offset	0.00003	OK	Reported Offset	0.00003
AECOM Slope	0.8336	OK	Reported Slope	0.8336
AECOM Calculated r	0.99998	OK	Reported r	0.99998

LCS calculation

GP182-B1

P. 74,108

Background Absorbance	0
Total absorbance	0.812
Total absorbance - background	0.812
Instrument Concentration	0.974
Sample weight (mg/kg)	0.0025
Final Volume (L)	0.1
Dilution Factor	1

AECOM Calculated LCS Result (mg/Kg)	39.0	OK	Reported Result (mg/Kg)	39.0
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%R = Found/True*100

GP182-B1

P. 74,108

True Value (mg/kg)	40
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AECOM Calculated %R	97.4	OK, rounding	Reported %R	97.5
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MS calculation

GP182-S2

P. 76,77,108

JC27483-4

Background reading	0
Total absorbance	0.478
Total absorbance - background	0.478
Instrument Concentration	0.5734
Sample weight (mg/kg)	0.00252
Final Volume (L)	0.1
Percent solids	0.877
Dilution Factor	50

AECOM Calculated MS Result (mg/Kg)	1297	OK, rounding	Reported Result (mg/Kg)	1300
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%R = Found/True*100

GP182-S2

P. 76,77,108

JC27483-4

True Value (mg/kg)	1300
Native concentration (mg/Kg)	0

AECOM %R	99.8	OK, rounding	Reported %R	100
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Percent Solids	JC27483-4	P. 77	NFS-PDI-EE15B-12.0-12.5
Empty dish weight=		26.83	
Wet weight=		35.18	
Dry weight=		34.15	
AECOM %solids =		87.7	OK
			Reported %solids= 87.7

Reporting Limit	JC27483-4	P. 18,77,108	NFS-PDI-EE15B-12.0-12.5
Low Standard		0.01	
Initial weight (mg/kg)		0.0024	
Final volume (L)		0.1	
Percent solids		0.877	
Dilution Factor		1	
Reporting Limit		0.48	OK, rounding
			Reported RL (mg/Kg)= 0.46

Sample Calculations	JC27483-4	P. 18,77,108	NFS-PDI-EE15B-12.0-12.5
Background reading		0.002	
Total absorbance		0.007	
Total absorbance - background		0.005	
Instrument Response		0.006	
Sample weight (mg/kg)		0.0024	
Final Volume (L)		0.1	
Percent solids		0.877	
Dilution Factor		1	
AECOM Calculated Result (mg/Kg)		0.28	OK, <MDL, ND
			Reported Result (mg/Kg) 0.32 U

Associated w/ samples JC27483-1 through JC27483-12

SDG#: JC27483/ Method 7196

Batch: GN52315

Cr+6 ICAL 9/21/16

Soil

(p. 116 of data pkg)

x - concentration	y - response
0	0.001
0.01	0.008
0.05	0.039
0.1	0.08
0.3	0.241
0.5	0.405
0.8	0.637
1	0.820

(p. 116 of data pkg)

AECOM Calculated Offset	-0.0012	OK	Reported Offset	-0.0012
AECOM Slope	0.8119	OK	Reported Slope	0.8119
AECOM Calculated r	0.99984	OK	Reported r	0.99984

LCS calculation

GP196-B1

P. 74,116

Background Absorbance	0
Total absorbance	0.753
Total absorbance - background	0.753
Instrument Concentration	0.929
Sample weight (mg/kg)	0.0025
Final Volume (L)	0.1
Dilution Factor	1

AECOM Calculated LCS Result (mg/Kg)	37.2	OK	Reported Result (mg/Kg)	37.2
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%R = Found/True*100

GP196-B1

P. 74,116

True Value (mg/kg)	40
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AECOM Calculated %R	92.9	OK, rounding	Reported %R	93.0
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MS calculation

GP196-S2

P. 76,79,116

JC27483-16

Background reading	0
Total absorbance	0.396
Total absorbance - background	0.396
Instrument Concentration	0.4893
Sample weight (mg/kg)	0.00241
Final Volume (L)	0.1
Percent solids	0.836
Dilution Factor	50

AECOM Calculated MS Result (mg/Kg)	1214	OK, rounding	Reported Result (mg/Kg)	1210
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%R = Found/True*100

GP196-S2

P. 76,79,116

JC27483-16

True Value (mg/kg)	1340
Native concentration (mg/Kg)	0.38

AECOM %R	90.6	OK, rounding	Reported %R	90.2
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Percent Solids	JC27483-16	P. 79	NFS-PDI-Z13B-11.0-11.5
Empty dish weight=	17.95		
Wet weight=	23.32		
Dry weight=	22.44		
AECOM %solids =	83.6	OK	Reported %solids= 83.6

Reporting Limit	JC27483-16	P. 79,116	NFS-PDI-Z13B-11.0-11.5
Low Standard	0.01		
Initial weight (mg/kg)	0.00243		
Final volume (L)	0.1		
Percent solids	0.836		
Dilution Factor	1		
Reporting Limit	0.49	OK, rounding	Reported RL (mg/Kg)= 0.48

Sample Calculations	JC27483-16	P. 79,116	NFS-PDI-Z13B-11.0-11.5
Background reading	0		
Total absorbance	0.005		
Total absorbance - background	0.005		
Instrument Response	0.008		
Sample weight (mg/kg)	0.00243		
Final Volume (L)	0.1		
Percent solids	0.836		
Dilution Factor	1		
AECOM Calculated Result (mg/Kg)	0.38	OK	Reported Result (mg/Kg) 0.38 B

Associated w/ samples JC27483-13 through JC27483-24

SDG#: JC27483R/ Method 7196

Batch: GN53068

Cr+6 ICAL 10/6/16

Soil

(p. 89 of data pkg)

x - concentration	y - response
0	0
0.01	0.008
0.05	0.04
0.1	0.082
0.3	0.252
0.5	0.431
0.8	0.677
1	0.846

(p. 89 of data pkg)

AECOM Calculated Offset	-0.0008	OK	Reported Offset	-0.0008
AECOM Slope	0.8488	OK	Reported Slope	0.8488
AECOM Calculated r	0.99995	OK	Reported r	0.99995

LCS calculation

GP524-B1

P. 46,89

Background Absorbance	0
Total absorbance	0.789
Total absorbance - background	0.789
Instrument Concentration	0.931
Sample weight (mg/kg)	0.0025
Final Volume (L)	0.1
Dilution Factor	1

AECOM Calculated LCS Result (mg/Kg)	37.2	OK	Reported Result (mg/Kg)	37.2
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%R = Found/True*100

GP524-B1

P. 46,89

True Value (mg/kg)	40
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AECOM Calculated %R	93.1	OK, rounding	Reported %R	93.0
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MS calculation

GP524-S2

P. 48,54,89

JC27483-4R

Background reading	0
Total absorbance	0.281
Total absorbance - background	0.281
Instrument Concentration	0.3320
Sample weight (mg/kg)	0.00244
Final Volume (L)	0.1
Percent solids	0.877
Dilution Factor	50

AECOM Calculated MS Result (mg/Kg)	776	OK	Reported Result (mg/Kg)	776
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%R = Found/True*100

GP524-S2

P. 48,54,89

JC27483-4R

True Value (mg/kg)	850
Native concentration (mg/Kg)	0.37

AECOM%R	91.2	OK, rounding	Reported %R	91.3
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Percent Solids	JC27483-4R	P. 54	NFS-PDI-EE15B-12.0-12.5
Empty dish weight=	26.83		
Wet weight=	35.18		
Dry weight=	34.15		
AECOM %solids =	87.7	OK	Reported %solids= 87.7

Reporting Limit	JC27483-4R	P. 12,54,89	NFS-PDI-EE15B-12.0-12.5
Low Standard	0.01		
Initial weight (mg/kg)	0.00247		
Final volume (L)	0.1		
Percent solids	0.877		
Dilution Factor	1		
Reporting Limit	0.46	OK	Reported RL (mg/Kg)= 0.46

Sample Calculations	JC27483-4R	P. 12,54,89	NFS-PDI-EE15B-12.0-12.5
Background reading	0		
Total absorbance	0.006		
Total absorbance - background	0.006		
Instrument Response	0.008		
Sample weight (mg/kg)	0.00247		
Final Volume (L)	0.1		
Percent solids	0.877		
Dilution Factor	1		
AECOM Calculated Result (mg/Kg)	0.37	OK	Reported Result (mg/Kg) 0.37 B

Associated w/ samples JC27483-2R through JC27438-12R

Data Validation Report

Project:	PPG - North Forest Street PDI	
Laboratory:	SGS/Accutest, Dayton, NJ	
Laboratory Job No.:	JC27483A	
Analysis/Method:	Volatile Organic Compounds (VOCs) by GCMS/SW-846 8260C Semivolatile Organic Compounds (SVOCs) by GCMS/SW-846 8270D TAL Metals SW-846 3010A/3050B/6010C/7470A/7471B	
Validation Level:	Limited	
Site Location/Address:	70 Carteret Avenue	
AECOM Project No:	60314351.GA.DE.PDI.NFS	
Prepared by:	Paula DiMattei/AECOM	Completed on: 11/1/2016
Reviewed by:	Kristin Rutherford /AECOM	File Name: JC27483_DVReport-F

Introduction

The data were reviewed in accordance with the FSP-QAPP and the following NJDEP and / or Region 2 validation Standard Operating Procedure(s) (SOP):

- NJDEP Office of Data Quality SOP 5.A.16, Rev 1 (May 2002), Quality Assurance Data Validation of Analytical Deliverables for Inorganics (based on USEPA SW-846 Methods);
- ICP-AES Data Validation, SOP No. HW-3a Revision 0 (July 2015);
- Mercury and Cyanide Data Validation, SOP No. HW-3c Revision 0 (July 2015) ISM02.2;
- Low/Medium Volatile Data Validation, SOP No. HW-33A Revision 0 (July 2015) SOM02.2;
- Semivolatile Data Validation SOP No. HW-35A Revision 0 (June 2015) SOM02.2.

The results of quality control data analyzed with site samples were used to assess the overall reliability of the data. The following qualifiers were used to identify data quality issues:

- U: Indicates the analyte was not detected in the sample above the sample reporting limit.
- J: Indicates the result was an estimated value; the associated numerical value was an approximate concentration of the analyte in the sample.
- UJ: Indicates the analyte was not detected above the reporting limit and the reporting limit was approximate.
- R: The sample result was rejected due to serious deficiencies; the presence or absence of the analyte could not be confirmed.

RA: The sample result was rejected due to NJ specific data validation QC requirements; however, the result is usable for project objectives. Refer to the Data Quality and Usability section in this data validation report for further discussion.

Sample Information

The samples listed below were collected by AECOM on September 13, 2016 as part of the PPG - North Forest Street PDI sampling at 70 Carteret Avenue, Jersey City, New Jersey. Only the samples and parameters listed below were validated.

Field ID	Laboratory ID	Matrix	Fraction
NFS-FB20160913 (Field blank)	JC27483-25A	Aqueous	TAL Metals, SVOCs and VOCs
NFS-PDI-EE15B-0.0-0.5	JC27483-1A	Soil	TAL Metals, SVOCs and VOCs
NFS-PDI-EE15B-10.0-10.5	JC27483-2A	Soil	TAL Metals, SVOCs and VOCs
NFS-PDI-EE15B-11.5-12.0	JC27483-3A	Soil	TAL Metals, SVOCs and VOCs
NFS-PDI-EE15B-12.0-12.5	JC27483-4A	Soil	TAL Metals, SVOCs and VOCs
NFS-PDI-EE15B-14.0-14.5	JC27483-5A	Soil	TAL Metals, SVOCs and VOCs
NFS-PDI-EE15B-16.0-16.5	JC27483-6A	Soil	TAL Metals, SVOCs and VOCs
NFS-PDI-EE15B-18.0-18.5	JC27483-7A	Soil	TAL Metals, SVOCs and VOCs
NFS-PDI-EE15B-2.0-2.5	JC27483-8A	Soil	TAL Metals, SVOCs and VOCs
NFS-PDI-EE15B-20.0-20.5	JC27483-9A	Soil	TAL Metals, SVOCs and VOCs
NFS-PDI-EE15B-4.0-4.5X [Field duplicate of NFS-PDI-EE15B-4.0-4.5]	JC27483-10A	Soil	TAL Metals, SVOCs and VOCs
NFS-PDI-EE15B-4.0-4.5	JC27483-11A	Soil	TAL Metals, SVOCs and VOCs
NFS-PDI-EE15B-6.0-6.5	JC27483-12A	Soil	TAL Metals, SVOCs and VOCs
NFS-PDI-EE15B-8.0-8.5	JC27483-13A	Soil	TAL Metals, SVOCs and VOCs

The samples were collected following the procedures detailed in the Work Order for Garfield Avenue Remedial Action (GARA) at 70 Carteret Avenue and the Field Sampling Plan/Quality Assurance Project Plan for Non-Residential and Residential Chromium Sites Hudson County, New Jersey (December 2011).

General Comments

The data package was complete. The sample ID listed on the chain-of-custody for JC 27483-10A, NFS-PDI-EE15B-4.0-4.0X was corrected to NFS-PDI-EE15B-4.0-4.5X after submission of samples to the laboratory. No other discrepancies were noted.

Quality control (QC) issues identified during validation are discussed below. Refer to the Target Analyte Summary Hit List(s) in Attachment A for a listing of all detected results, qualified results, and associated qualifications, where applicable. The nonconformances for each section discussed below are presented in Attachment B.

TAL Metals

Laboratory Blanks/Field Blank

Aluminum, barium, calcium, copper, iron, and zinc were detected in the method blank associated with the soil samples in this data set. These analytes were detected in the associated soil samples at concentrations greater than ten times the concentration found in the method blank; therefore, no qualifications were made.

Iron, sodium, and zinc were detected in the method blank associated with the equipment blank in this data set. The result for zinc in NFS-FB20160913 was less than three times the method blank concentration; therefore, the result was negated (UB) at the sample reporting limit. The result for sodium in NFS-FB20160913 was greater than three times but less than ten times the method blank concentration; therefore, the result was qualified (JB) as estimated. Iron was not detected in the equipment blank; therefore, no qualifications were required.

Manganese, nickel, and potassium were detected in equipment blank NFS-FB20160913. Since the results for these analytes in the associated soils samples were greater than ten times the equipment blank contamination, no qualifications were required.

Refer to the Target Analyte Summary Hit List(s) in Attachment A for a listing of all results qualified on the basis of method blank contamination. Refer to the nonconformance tables in Appendix B for a listing of blank results and associated qualification actions.

Matrix Spike/Matrix Spike Duplicate (MS/MSD) Results

The percent recovery (%R) for aluminum exceeded the QC acceptance limits in the MS/MSD analysis performed on sample NFS-PDI-EE15B-12.0-12.5. The positive result for aluminum in sample NFS-PDI-EE15B-12.0-12.5 was qualified as estimated (J). Additionally, the %R for antimony and magnesium fell below the QC acceptance limits in the MS and/or MSD analysis. The positive and nondetect results for antimony and magnesium in sample NFS-PDI-EE15B-12.0-12.5 were qualified as estimated (J/UJ).

Refer to the Target Analyte Summary Hit List(s) in Attachment A for a listing of all results qualified on the basis of MS/MSD nonconformances. Refer to the nonconformance tables in Appendix B for a listing of qualification actions.

Field Duplicates

Samples NFS-PDI-EE15B-4.0-4.5 and NFS-PDI-EE15B-4.0-4.5X are the field duplicate pair analyzed in this data set. The relative percent difference (RPD) for lead exceeded the QC acceptance limit. The positive results for lead in samples NFS-PDI-EE15B-4.0-4.5 and NFS-PDI-EE15B-4.0-4.5X were qualified as estimated (J).

Refer to the Target Analyte Summary Hit List(s) in Attachment A for a listing of all results qualified on the basis of field duplicate nonconformances. Refer to the nonconformance tables in Appendix B for a listing of qualification actions.

Sample Results

Reported results (flagged B by the laboratory) that were less than the RL, but greater than or equal to the MDL, are approximate values and have been qualified as estimated (J).

VOCs

Laboratory Blanks

Methylene chloride was found in the method blank associated with soil samples NFS-PDI-EE15B-12.0-12.5 and NFS-PDI-EE15B-6.0-6.5. Methylene chloride was negated (U) at the sample reporting limit in soil samples NFS-PDI-EE15B-12.0-12.5 and NFS-PDI-EE15B-6.0-6.5.

Refer to the Target Analyte Summary Hit List(s) in Attachment A for a listing of all results qualified on the basis of method blank contamination. Refer to the nonconformance tables in Appendix B for a listing of blank results and associated qualification actions.

Field Duplicates

Samples NFS-PDI-EE15B-4.0-4.5 and NFS-PDI-EE15B-4.0-4.5X are the field duplicate pair analyzed in this data set. The RPD for methylcyclohexane exceeded the QC acceptance limit. The positive results for methylcyclohexane in samples NFS-PDI-EE15B-4.0-4.5 and NFS-PDI-EE15B-4.0-4.5X were qualified as estimated (J). The RPD for cis-1,2-dichloroethene was not calculable since this compound was not detected in the field duplicate sample. Professional judgment was used to qualify the positive and nondetect results for cis-1,2-dichloroethene in samples NFS-PDI-EE15B-4.0-4.5 and NFS-PDI-EE15B-4.0-4.5X as estimated (J/UJ).

Refer to the Target Analyte Summary Hit List(s) in Attachment A for a listing of all results qualified on the basis of field duplicate nonconformances. Refer to the nonconformance tables in Appendix B for a listing of qualification actions.

Sample Results

The nondetect result for select VOCs in sample NFS-PDI-EE15B-4.0-4.5 exceeded the NJDEP DIGWSSL or RDCSRS action levels; therefore, the nondetect results may not meet project objectives. Refer to the nonconformance tables in Appendix B for a listing of results exceeding the NJDEP DIGWSSL and RDCSRS criteria.

Reported results (flagged J by the laboratory) that were less than the RL but greater than or equal to the MDL are approximate values. This qualifier was retained during data validation.

SVOCs

Field Duplicates

Samples NFS-PDI-EE15B-4.0-4.5 and NFS-PDI-EE15B-4.0-4.5X are the field duplicate pair analyzed in this data set. The RPDs for pyrene, fluoranthene, benzo(a)pyrene, benzo(a)anthracene, phenanthrene and naphthalene exceeded the QC acceptance limit. The positive results for these compounds in samples NFS-PDI-EE15B-4.0-4.5 and NFS-PDI-EE15B-4.0-4.5X were qualified as estimated (J).

Refer to the Target Analyte Summary Hit List(s) in Attachment A for a listing of all results qualified on the basis of field duplicate nonconformances. Refer to the nonconformance tables in Appendix B for a listing of qualification actions.

Sample Results

The nondetect result for 2,4-dinitrophenol in samples NFS-PDI-EE15B-2.0-2.5 and NFS-PDI-EE15B-6.0-6.5 exceeded the NJDEP DIGWSSL action levels; therefore, the nondetect result may not meet

project objectives. Refer to the nonconformance tables in Appendix B for a listing of results exceeding the NJDEP DIGWSSL criteria.

Reported results (flagged J by the laboratory) that were less than the RL but greater than or equal to the MDL, are approximate values. This qualifier was retained during data validation.

Data Quality and Usability

The following issues were noted for this sample set:

- Zinc in the equipment blank sample NFS-FB20160913 is usable as a nondetect result due to method blank contamination.
- Sodium in equipment blank sample NFS-FB20160913 is usable as an estimated result due to method blank contamination.
- The positive result for aluminum in sample NFS-PDI-EE15B-12.0-12.5 is usable as an estimated result that may be biased high due to the high MS/MSD recoveries.
- The positive and nondetect results for antimony and magnesium in sample NFS-PDI-EE15B-12.0-12.5 are usable as estimated results that may be biased low due to the low MS and/or MSD recoveries.
- The positive and nondetect results for lead, methylcyclohexane, cis-1,2-dichloroethene, pyrene, fluoranthene, benzo(a)pyrene, benzo(a)anthracene, phenanthrene and naphthalene in the field duplicate pair, NFS-PDI-EE15B-4.0-4.5 and NFS-PDI-EE15B-4.0-4.5X, are usable as estimated results with an unknown direction of bias due to field duplicate imprecision.
- The nondetect results for select VOCs and SVOCs exceeded the NJDEP DIGWSSL or RDCSRS action levels; therefore, the nondetect results may not meet project objectives.
- Sample results reported between the MDL and RL are usable as estimated values with an unknown directional bias.

ATTACHMENTS

Attachment A: Target Analyte Summary Hit List(s)

Attachment B: Data Validation Report Form

Attachment A

Target Analyte Summary Hit List(s)

Soil Target Analyte Summary Hit List (TAL Metals)

Site Name PPG - North Forest Street PDI
Sampling Date September 13, 2016
Lab Name/ID SGS/Accutest, Dayton, NJ
SDG No JC27483A
Sample Matrix Soil
Trip Blank ID NA
Field Blank ID NFS-FB20160913

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
NFS-PDI-EE15B-4.0-4.5X	JC27483-10A	ALUMINUM	3.7	6310	6310	57		
NFS-PDI-EE15B-4.0-4.5	JC27483-11A	ALUMINUM	3.7	7030	7030	58		
NFS-PDI-EE15B-6.0-6.5	JC27483-12A	ALUMINUM	3.7	14100	14100	64		
NFS-PDI-EE15B-8.0-8.5	JC27483-13A	ALUMINUM	3.7	9020	9020	57		
NFS-PDI-EE15B-0.0-0.5	JC27483-1A	ALUMINUM	3.7	5040	5040	51		
NFS-PDI-EE15B-10.0-10.5	JC27483-2A	ALUMINUM	3.7	8770	8770	54		
NFS-PDI-EE15B-11.5-12.0	JC27483-3A	ALUMINUM	3.7	10100	10100	56		
NFS-PDI-EE15B-12.0-12.5	JC27483-4A	ALUMINUM	3.7	8590	8590	56	Qualify	1
NFS-PDI-EE15B-14.0-14.5	JC27483-5A	ALUMINUM	3.7	5710	5710	57		
NFS-PDI-EE15B-16.0-16.5	JC27483-6A	ALUMINUM	3.7	4890	4890	63		
NFS-PDI-EE15B-18.0-18.5	JC27483-7A	ALUMINUM	3.7	3960	3960	59		
NFS-PDI-EE15B-2.0-2.5	JC27483-8A	ALUMINUM	3.7	4280	4280	55		
NFS-PDI-EE15B-20.0-20.5	JC27483-9A	ALUMINUM	3.7	5420	5420	58		
NFS-PDI-EE15B-12.0-12.5	JC27483-4A	ANTIMONY	U	U	U	2.2	Qualify	1
NFS-PDI-EE15B-2.0-2.5	JC27483-8A	ANTIMONY	U	2.4	2.4	2.2		
NFS-PDI-EE15B-4.0-4.5X	JC27483-10A	ARSENIC	U	5.0	5.0	2.3		
NFS-PDI-EE15B-4.0-4.5	JC27483-11A	ARSENIC	U	5.0	5.0	2.3		

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
NFS-PDI-EE15B-6.0-6.5	JC27483-12A	ARSENIC	U	4.2	4.2	2.6		
NFS-PDI-EE15B-8.0-8.5	JC27483-13A	ARSENIC	U	5.9	5.9	2.3		
NFS-PDI-EE15B-0.0-0.5	JC27483-1A	ARSENIC	U	12.0	12.0	2.1		
NFS-PDI-EE15B-10.0-10.5	JC27483-2A	ARSENIC	U	16.1	16.1	2.2		
NFS-PDI-EE15B-11.5-12.0	JC27483-3A	ARSENIC	U	4.5	4.5	2.2		
NFS-PDI-EE15B-12.0-12.5	JC27483-4A	ARSENIC	U	3.3	3.3	2.2		
NFS-PDI-EE15B-14.0-14.5	JC27483-5A	ARSENIC	U	4.8	4.8	2.3		
NFS-PDI-EE15B-16.0-16.5	JC27483-6A	ARSENIC	U	2.3B	2.3	2.5	Qualify	3
NFS-PDI-EE15B-18.0-18.5	JC27483-7A	ARSENIC	U	1.9B	1.9	2.4	Qualify	3
NFS-PDI-EE15B-2.0-2.5	JC27483-8A	ARSENIC	U	21.7	21.7	2.2		
NFS-PDI-EE15B-20.0-20.5	JC27483-9A	ARSENIC	U	2.8	2.8	2.3		
NFS-PDI-EE15B-4.0-4.5X	JC27483-10A	BARIUM	0.18	63.7	63.7	23		
NFS-PDI-EE15B-4.0-4.5	JC27483-11A	BARIUM	0.18	83.4	83.4	23		
NFS-PDI-EE15B-6.0-6.5	JC27483-12A	BARIUM	0.18	51.6	51.6	26		
NFS-PDI-EE15B-8.0-8.5	JC27483-13A	BARIUM	0.18	25.8	25.8	23		
NFS-PDI-EE15B-0.0-0.5	JC27483-1A	BARIUM	0.18	30.6	30.6	21		
NFS-PDI-EE15B-10.0-10.5	JC27483-2A	BARIUM	0.18	46.6	46.6	22		
NFS-PDI-EE15B-11.5-12.0	JC27483-3A	BARIUM	0.18	36.6	36.6	22		
NFS-PDI-EE15B-12.0-12.5	JC27483-4A	BARIUM	0.18	32.8	32.8	22		
NFS-PDI-EE15B-14.0-14.5	JC27483-5A	BARIUM	0.18	32.5	32.5	23		
NFS-PDI-EE15B-16.0-16.5	JC27483-6A	BARIUM	0.18	21.9B	21.9	25	Qualify	3
NFS-PDI-EE15B-18.0-18.5	JC27483-7A	BARIUM	0.18	17.6B	17.6	24	Qualify	3
NFS-PDI-EE15B-2.0-2.5	JC27483-8A	BARIUM	0.18	258	258	22		
NFS-PDI-EE15B-20.0-20.5	JC27483-9A	BARIUM	0.18	43.6	43.6	23		
NFS-PDI-EE15B-4.0-4.5X	JC27483-10A	BERYLLIUM	U	0.33	0.33	0.23		

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
NFS-PDI-EE15B-4.0-4.5	JC27483-11A	BERYLLIUM	U	0.37	0.37	0.23		
NFS-PDI-EE15B-6.0-6.5	JC27483-12A	BERYLLIUM	U	0.71	0.71	0.26		
NFS-PDI-EE15B-8.0-8.5	JC27483-13A	BERYLLIUM	U	0.68	0.68	0.23		
NFS-PDI-EE15B-0.0-0.5	JC27483-1A	BERYLLIUM	U	0.47	0.47	0.21		
NFS-PDI-EE15B-10.0-10.5	JC27483-2A	BERYLLIUM	U	0.56	0.56	0.22		
NFS-PDI-EE15B-11.5-12.0	JC27483-3A	BERYLLIUM	U	0.88	0.88	0.22		
NFS-PDI-EE15B-12.0-12.5	JC27483-4A	BERYLLIUM	U	0.67	0.67	0.22		
NFS-PDI-EE15B-14.0-14.5	JC27483-5A	BERYLLIUM	U	1.2	1.2	0.23		
NFS-PDI-EE15B-16.0-16.5	JC27483-6A	BERYLLIUM	U	0.45	0.45	0.25		
NFS-PDI-EE15B-18.0-18.5	JC27483-7A	BERYLLIUM	U	0.47	0.47	0.24		
NFS-PDI-EE15B-2.0-2.5	JC27483-8A	BERYLLIUM	U	0.49	0.49	0.22		
NFS-PDI-EE15B-20.0-20.5	JC27483-9A	BERYLLIUM	U	0.58	0.58	0.23		
NFS-PDI-EE15B-4.0-4.5X	JC27483-10A	CADMIUM	U	0.36B	0.36	0.57	Qualify	3
NFS-PDI-EE15B-4.0-4.5	JC27483-11A	CADMIUM	U	0.38B	0.38	0.58	Qualify	3
NFS-PDI-EE15B-2.0-2.5	JC27483-8A	CADMIUM	U	1.2	1.2	0.55		
NFS-PDI-EE15B-20.0-20.5	JC27483-9A	CADMIUM	U	0.069B	0.069	0.58	Qualify	3
NFS-PDI-EE15B-4.0-4.5X	JC27483-10A	CALCIUM METAL	11.4	14100	14100	570		
NFS-PDI-EE15B-4.0-4.5	JC27483-11A	CALCIUM METAL	11.4	12500	12500	580		
NFS-PDI-EE15B-6.0-6.5	JC27483-12A	CALCIUM METAL	11.4	1250	1250	640		
NFS-PDI-EE15B-8.0-8.5	JC27483-13A	CALCIUM METAL	11.4	635	635	570		
NFS-PDI-EE15B-0.0-0.5	JC27483-1A	CALCIUM METAL	11.4	3630	3630	510		
NFS-PDI-EE15B-10.0-10.5	JC27483-2A	CALCIUM METAL	11.4	3470	3470	540		
NFS-PDI-EE15B-11.5-12.0	JC27483-3A	CALCIUM METAL	11.4	982	982	560		
NFS-PDI-EE15B-12.0-12.5	JC27483-4A	CALCIUM METAL	11.4	871	871	560		
NFS-PDI-EE15B-14.0-14.5	JC27483-5A	CALCIUM METAL	11.4	1030	1030	570		

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
NFS-PDI-EE15B-16.0-16.5	JC27483-6A	CALCIUM METAL	11.4	792	792	630		
NFS-PDI-EE15B-18.0-18.5	JC27483-7A	CALCIUM METAL	11.4	841	841	590		
NFS-PDI-EE15B-2.0-2.5	JC27483-8A	CALCIUM METAL	11.4	9500	9500	550		
NFS-PDI-EE15B-20.0-20.5	JC27483-9A	CALCIUM METAL	11.4	2220	2220	580		
NFS-PDI-EE15B-4.0-4.5X	JC27483-10A	CHROMIUM	U	12.6	12.6	1.1		
NFS-PDI-EE15B-4.0-4.5	JC27483-11A	CHROMIUM	U	19.9	19.9	1.2		
NFS-PDI-EE15B-6.0-6.5	JC27483-12A	CHROMIUM	U	15.0	15.0	1.3		
NFS-PDI-EE15B-8.0-8.5	JC27483-13A	CHROMIUM	U	16.8	16.8	1.1		
NFS-PDI-EE15B-0.0-0.5	JC27483-1A	CHROMIUM	U	41.8	41.8	1.0		
NFS-PDI-EE15B-10.0-10.5	JC27483-2A	CHROMIUM	U	31.5	31.5	1.1		
NFS-PDI-EE15B-11.5-12.0	JC27483-3A	CHROMIUM	U	18.7	18.7	1.1		
NFS-PDI-EE15B-12.0-12.5	JC27483-4A	CHROMIUM	U	20.5	20.5	1.1		
NFS-PDI-EE15B-14.0-14.5	JC27483-5A	CHROMIUM	U	16.3	16.3	1.1		
NFS-PDI-EE15B-16.0-16.5	JC27483-6A	CHROMIUM	U	10.6	10.6	1.3		
NFS-PDI-EE15B-18.0-18.5	JC27483-7A	CHROMIUM	U	9.9	9.9	1.2		
NFS-PDI-EE15B-2.0-2.5	JC27483-8A	CHROMIUM	U	31.9	31.9	2.2		
NFS-PDI-EE15B-20.0-20.5	JC27483-9A	CHROMIUM	U	13.6	13.6	1.2		
NFS-PDI-EE15B-4.0-4.5X	JC27483-10A	COBALT	U	4.5B	4.5	5.7	Qualify	3
NFS-PDI-EE15B-4.0-4.5	JC27483-11A	COBALT	U	4.8B	4.8	5.8	Qualify	3
NFS-PDI-EE15B-6.0-6.5	JC27483-12A	COBALT	U	10.1	10.1	6.4		
NFS-PDI-EE15B-8.0-8.5	JC27483-13A	COBALT	U	5.9	5.9	5.7		
NFS-PDI-EE15B-0.0-0.5	JC27483-1A	COBALT	U	7.2	7.2	5.1		
NFS-PDI-EE15B-10.0-10.5	JC27483-2A	COBALT	U	7.5	7.5	5.4		
NFS-PDI-EE15B-11.5-12.0	JC27483-3A	COBALT	U	5.5B	5.5	5.6	Qualify	3
NFS-PDI-EE15B-12.0-12.5	JC27483-4A	COBALT	U	5.8	5.8	5.6		

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
NFS-PDI-EE15B-14.0-14.5	JC27483-5A	COBALT	U	3.8B	3.8	5.7	Qualify	3
NFS-PDI-EE15B-16.0-16.5	JC27483-6A	COBALT	U	2.8B	2.8	6.3	Qualify	3
NFS-PDI-EE15B-18.0-18.5	JC27483-7A	COBALT	U	2.3B	2.3	5.9	Qualify	3
NFS-PDI-EE15B-2.0-2.5	JC27483-8A	COBALT	U	8.0	8.0	5.5		
NFS-PDI-EE15B-20.0-20.5	JC27483-9A	COBALT	U	4.6B	4.6	5.8	Qualify	3
NFS-PDI-EE15B-4.0-4.5X	JC27483-10A	COPPER	0.26	23.8	23.8	2.9		
NFS-PDI-EE15B-4.0-4.5	JC27483-11A	COPPER	0.26	28.0	28.0	2.9		
NFS-PDI-EE15B-6.0-6.5	JC27483-12A	COPPER	0.26	13.5	13.5	3.2		
NFS-PDI-EE15B-8.0-8.5	JC27483-13A	COPPER	0.26	10.9	10.9	2.9		
NFS-PDI-EE15B-0.0-0.5	JC27483-1A	COPPER	0.26	27.2	27.2	5.1		
NFS-PDI-EE15B-10.0-10.5	JC27483-2A	COPPER	0.26	30.0	30.0	5.4		
NFS-PDI-EE15B-11.5-12.0	JC27483-3A	COPPER	0.26	14.7	14.7	2.8		
NFS-PDI-EE15B-12.0-12.5	JC27483-4A	COPPER	0.26	9.6	9.6	2.8		
NFS-PDI-EE15B-14.0-14.5	JC27483-5A	COPPER	0.26	10.6	10.6	2.9		
NFS-PDI-EE15B-16.0-16.5	JC27483-6A	COPPER	0.26	10.4	10.4	3.1		
NFS-PDI-EE15B-18.0-18.5	JC27483-7A	COPPER	0.26	10.6	10.6	3.0		
NFS-PDI-EE15B-2.0-2.5	JC27483-8A	COPPER	0.26	176	176	5.5		
NFS-PDI-EE15B-20.0-20.5	JC27483-9A	COPPER	0.26	8.8	8.8	2.9		
NFS-PDI-EE15B-4.0-4.5X	JC27483-10A	IRON	4.1	12800	12800	57		
NFS-PDI-EE15B-4.0-4.5	JC27483-11A	IRON	4.1	14500	14500	58		
NFS-PDI-EE15B-6.0-6.5	JC27483-12A	IRON	4.1	15800	15800	64		
NFS-PDI-EE15B-8.0-8.5	JC27483-13A	IRON	4.1	17300	17300	57		
NFS-PDI-EE15B-0.0-0.5	JC27483-1A	IRON	4.1	36700	36700	100		
NFS-PDI-EE15B-10.0-10.5	JC27483-2A	IRON	4.1	33200	33200	110		
NFS-PDI-EE15B-11.5-12.0	JC27483-3A	IRON	4.1	20000	20000	56		

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NFS-PDI-EE15B-12.0-12.5	JC27483-4A	IRON	4.1	18300	18300	56		
NFS-PDI-EE15B-14.0-14.5	JC27483-5A	IRON	4.1	16600	16600	57		
NFS-PDI-EE15B-16.0-16.5	JC27483-6A	IRON	4.1	10800	10800	63		
NFS-PDI-EE15B-18.0-18.5	JC27483-7A	IRON	4.1	9830	9830	59		
NFS-PDI-EE15B-2.0-2.5	JC27483-8A	IRON	4.1	33100	33100	110		
NFS-PDI-EE15B-20.0-20.5	JC27483-9A	IRON	4.1	11900	11900	58		
NFS-PDI-EE15B-4.0-4.5X	JC27483-10A	LEAD	U	55.5	55.5	2.3	Qualify	2
NFS-PDI-EE15B-4.0-4.5	JC27483-11A	LEAD	U	413	413	2.3	Qualify	2
NFS-PDI-EE15B-6.0-6.5	JC27483-12A	LEAD	U	16.0	16.0	2.6		
NFS-PDI-EE15B-8.0-8.5	JC27483-13A	LEAD	U	12.4	12.4	2.3		
NFS-PDI-EE15B-0.0-0.5	JC27483-1A	LEAD	U	6.0	6.0	4.1		
NFS-PDI-EE15B-10.0-10.5	JC27483-2A	LEAD	U	28.7	28.7	4.3		
NFS-PDI-EE15B-11.5-12.0	JC27483-3A	LEAD	U	14.8	14.8	2.2		
NFS-PDI-EE15B-12.0-12.5	JC27483-4A	LEAD	U	9.5	9.5	2.2		
NFS-PDI-EE15B-14.0-14.5	JC27483-5A	LEAD	U	16.3	16.3	2.3		
NFS-PDI-EE15B-16.0-16.5	JC27483-6A	LEAD	U	9.3	9.3	2.5		
NFS-PDI-EE15B-18.0-18.5	JC27483-7A	LEAD	U	6.9	6.9	2.4		
NFS-PDI-EE15B-2.0-2.5	JC27483-8A	LEAD	U	849	849	4.4		
NFS-PDI-EE15B-20.0-20.5	JC27483-9A	LEAD	U	9.6	9.6	2.3		
NFS-PDI-EE15B-4.0-4.5X	JC27483-10A	MAGNESIUM	U	2020	2020	570		
NFS-PDI-EE15B-4.0-4.5	JC27483-11A	MAGNESIUM	U	2140	2140	580		
NFS-PDI-EE15B-6.0-6.5	JC27483-12A	MAGNESIUM	U	2550	2550	640		
NFS-PDI-EE15B-8.0-8.5	JC27483-13A	MAGNESIUM	U	2650	2650	570		
NFS-PDI-EE15B-0.0-0.5	JC27483-1A	MAGNESIUM	U	3350	3350	510		
NFS-PDI-EE15B-10.0-10.5	JC27483-2A	MAGNESIUM	U	2830	2830	540		

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NFS-PDI-EE15B-11.5-12.0	JC27483-3A	MAGNESIUM	U	3700	3700	560		
NFS-PDI-EE15B-12.0-12.5	JC27483-4A	MAGNESIUM	U	3650	3650	560	Qualify	1
NFS-PDI-EE15B-14.0-14.5	JC27483-5A	MAGNESIUM	U	2700	2700	570		
NFS-PDI-EE15B-16.0-16.5	JC27483-6A	MAGNESIUM	U	1660	1660	630		
NFS-PDI-EE15B-18.0-18.5	JC27483-7A	MAGNESIUM	U	1560	1560	590		
NFS-PDI-EE15B-2.0-2.5	JC27483-8A	MAGNESIUM	U	1740	1740	550		
NFS-PDI-EE15B-20.0-20.5	JC27483-9A	MAGNESIUM	U	2720	2720	580		
NFS-PDI-EE15B-4.0-4.5X	JC27483-10A	MANGANESE	U	621	621	1.7		
NFS-PDI-EE15B-4.0-4.5	JC27483-11A	MANGANESE	U	703	703	1.7		
NFS-PDI-EE15B-6.0-6.5	JC27483-12A	MANGANESE	U	194	194	1.9		
NFS-PDI-EE15B-8.0-8.5	JC27483-13A	MANGANESE	U	124	124	1.7		
NFS-PDI-EE15B-0.0-0.5	JC27483-1A	MANGANESE	U	175	175	3.1		
NFS-PDI-EE15B-10.0-10.5	JC27483-2A	MANGANESE	U	421	421	3.3		
NFS-PDI-EE15B-11.5-12.0	JC27483-3A	MANGANESE	U	190	190	1.7		
NFS-PDI-EE15B-12.0-12.5	JC27483-4A	MANGANESE	U	182	182	1.7		
NFS-PDI-EE15B-14.0-14.5	JC27483-5A	MANGANESE	U	112	112	1.7		
NFS-PDI-EE15B-16.0-16.5	JC27483-6A	MANGANESE	U	107	107	1.9		
NFS-PDI-EE15B-18.0-18.5	JC27483-7A	MANGANESE	U	67.4	67.4	1.8		
NFS-PDI-EE15B-2.0-2.5	JC27483-8A	MANGANESE	U	404	404	3.3		
NFS-PDI-EE15B-20.0-20.5	JC27483-9A	MANGANESE	U	394	394	1.7		
NFS-PDI-EE15B-4.0-4.5X	JC27483-10A	MERCURY	U	0.19	0.19	0.034		
NFS-PDI-EE15B-4.0-4.5	JC27483-11A	MERCURY	U	0.19	0.19	0.037		
NFS-PDI-EE15B-6.0-6.5	JC27483-12A	MERCURY	U	0.030B	0.030	0.033	Qualify	3
NFS-PDI-EE15B-8.0-8.5	JC27483-13A	MERCURY	U	0.011B	0.011	0.035	Qualify	3
NFS-PDI-EE15B-0.0-0.5	JC27483-1A	MERCURY	U	0.0098B	0.0098	0.032	Qualify	3

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NFS-PDI-EE15B-10.0-10.5	JC27483-2A	MERCURY	U	0.16	0.16	0.035		
NFS-PDI-EE15B-11.5-12.0	JC27483-3A	MERCURY	U	0.0083B	0.0083	0.035	Qualify	3
NFS-PDI-EE15B-16.0-16.5	JC27483-6A	MERCURY	U	0.018B	0.018	0.034	Qualify	3
NFS-PDI-EE15B-2.0-2.5	JC27483-8A	MERCURY	U	1.6	1.6	0.072		
NFS-PDI-EE15B-4.0-4.5X	JC27483-10A	NICKEL	U	12.4	12.4	4.6		
NFS-PDI-EE15B-4.0-4.5	JC27483-11A	NICKEL	U	13.5	13.5	4.6		
NFS-PDI-EE15B-6.0-6.5	JC27483-12A	NICKEL	U	14.1	14.1	5.1		
NFS-PDI-EE15B-8.0-8.5	JC27483-13A	NICKEL	U	9.9	9.9	4.6		
NFS-PDI-EE15B-0.0-0.5	JC27483-1A	NICKEL	U	16.4	16.4	4.1		
NFS-PDI-EE15B-10.0-10.5	JC27483-2A	NICKEL	U	14.8	14.8	4.3		
NFS-PDI-EE15B-11.5-12.0	JC27483-3A	NICKEL	U	12.2	12.2	4.5		
NFS-PDI-EE15B-12.0-12.5	JC27483-4A	NICKEL	U	14.8	14.8	4.5		
NFS-PDI-EE15B-14.0-14.5	JC27483-5A	NICKEL	U	9.0	9.0	4.6		
NFS-PDI-EE15B-16.0-16.5	JC27483-6A	NICKEL	U	7.2	7.2	5.0		
NFS-PDI-EE15B-18.0-18.5	JC27483-7A	NICKEL	U	6.5	6.5	4.7		
NFS-PDI-EE15B-2.0-2.5	JC27483-8A	NICKEL	U	181	181	4.4		
NFS-PDI-EE15B-20.0-20.5	JC27483-9A	NICKEL	U	11.5	11.5	4.6		
NFS-PDI-EE15B-4.0-4.5X	JC27483-10A	POTASSIUM	U	762B	762	1100	Qualify	3
NFS-PDI-EE15B-4.0-4.5	JC27483-11A	POTASSIUM	U	876B	876	1200	Qualify	3
NFS-PDI-EE15B-6.0-6.5	JC27483-12A	POTASSIUM	U	764B	764	1300	Qualify	3
NFS-PDI-EE15B-8.0-8.5	JC27483-13A	POTASSIUM	U	1010B	1010	1100	Qualify	3
NFS-PDI-EE15B-0.0-0.5	JC27483-1A	POTASSIUM	U	885B	885	1000	Qualify	3
NFS-PDI-EE15B-10.0-10.5	JC27483-2A	POTASSIUM	U	1000B	1000	1100	Qualify	3
NFS-PDI-EE15B-11.5-12.0	JC27483-3A	POTASSIUM	U	1260	1260	1100		
NFS-PDI-EE15B-12.0-12.5	JC27483-4A	POTASSIUM	U	1310	1310	1100		

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
NFS-PDI-EE15B-14.0-14.5	JC27483-5A	POTASSIUM	U	969B	969	1100	Qualify	3
NFS-PDI-EE15B-16.0-16.5	JC27483-6A	POTASSIUM	U	732B	732	1300	Qualify	3
NFS-PDI-EE15B-18.0-18.5	JC27483-7A	POTASSIUM	U	678B	678	1200	Qualify	3
NFS-PDI-EE15B-2.0-2.5	JC27483-8A	POTASSIUM	U	515B	515	1100	Qualify	3
NFS-PDI-EE15B-20.0-20.5	JC27483-9A	POTASSIUM	U	1400	1400	1200		
NFS-PDI-EE15B-4.0-4.5X	JC27483-10A	SELENIUM	U	0.57B	0.57	2.3	Qualify	3
NFS-PDI-EE15B-4.0-4.5	JC27483-11A	SELENIUM	U	0.64B	0.64	2.3	Qualify	3
NFS-PDI-EE15B-8.0-8.5	JC27483-13A	SELENIUM	U	0.59B	0.59	2.3	Qualify	3
NFS-PDI-EE15B-11.5-12.0	JC27483-3A	SELENIUM	U	0.54B	0.54	2.2	Qualify	3
NFS-PDI-EE15B-2.0-2.5	JC27483-8A	SELENIUM	U	1.8B	1.8	4.4	Qualify	3
NFS-PDI-EE15B-4.0-4.5X	JC27483-10A	SILVER	U	0.76	0.76	0.57		
NFS-PDI-EE15B-4.0-4.5	JC27483-11A	SILVER	U	0.83	0.83	0.58		
NFS-PDI-EE15B-6.0-6.5	JC27483-12A	SILVER	U	0.50B	0.50	0.64	Qualify	3
NFS-PDI-EE15B-8.0-8.5	JC27483-13A	SILVER	U	0.84	0.84	0.57		
NFS-PDI-EE15B-0.0-0.5	JC27483-1A	SILVER	U	1.1	1.1	1.0		
NFS-PDI-EE15B-10.0-10.5	JC27483-2A	SILVER	U	1.2	1.2	1.1		
NFS-PDI-EE15B-11.5-12.0	JC27483-3A	SILVER	U	0.56	0.56	0.56		
NFS-PDI-EE15B-12.0-12.5	JC27483-4A	SILVER	U	1.5	1.5	0.56		
NFS-PDI-EE15B-14.0-14.5	JC27483-5A	SILVER	U	0.64	0.64	0.57		
NFS-PDI-EE15B-16.0-16.5	JC27483-6A	SILVER	U	0.42B	0.42	0.63	Qualify	3
NFS-PDI-EE15B-18.0-18.5	JC27483-7A	SILVER	U	0.45B	0.45	0.59	Qualify	3
NFS-PDI-EE15B-2.0-2.5	JC27483-8A	SILVER	U	2.0	2.0	1.1		
NFS-PDI-EE15B-20.0-20.5	JC27483-9A	SILVER	U	0.56B	0.56	0.58	Qualify	3
NFS-PDI-EE15B-4.0-4.5X	JC27483-10A	SODIUM	U	96.3B	96.3	1100	Qualify	3
NFS-PDI-EE15B-4.0-4.5	JC27483-11A	SODIUM	U	103B	103	1200	Qualify	3

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
NFS-PDI-EE15B-6.0-6.5	JC27483-12A	SODIUM	U	63.8B	63.8	1300	Qualify	3
NFS-PDI-EE15B-8.0-8.5	JC27483-13A	SODIUM	U	72.2B	72.2	1100	Qualify	3
NFS-PDI-EE15B-0.0-0.5	JC27483-1A	SODIUM	U	210B	210	1000	Qualify	3
NFS-PDI-EE15B-10.0-10.5	JC27483-2A	SODIUM	U	143B	143	1100	Qualify	3
NFS-PDI-EE15B-11.5-12.0	JC27483-3A	SODIUM	U	91.2B	91.2	1100	Qualify	3
NFS-PDI-EE15B-12.0-12.5	JC27483-4A	SODIUM	U	79.6B	79.6	1100	Qualify	3
NFS-PDI-EE15B-14.0-14.5	JC27483-5A	SODIUM	U	72.4B	72.4	1100	Qualify	3
NFS-PDI-EE15B-16.0-16.5	JC27483-6A	SODIUM	U	59.5B	59.5	1300	Qualify	3
NFS-PDI-EE15B-18.0-18.5	JC27483-7A	SODIUM	U	55.8B	55.8	1200	Qualify	3
NFS-PDI-EE15B-2.0-2.5	JC27483-8A	SODIUM	U	246B	246	1100	Qualify	3
NFS-PDI-EE15B-20.0-20.5	JC27483-9A	SODIUM	U	129B	129	1200	Qualify	3
NFS-PDI-EE15B-4.0-4.5X	JC27483-10A	VANADIUM	U	14.0	14.0	5.7		
NFS-PDI-EE15B-4.0-4.5	JC27483-11A	VANADIUM	U	15.7	15.7	5.8		
NFS-PDI-EE15B-6.0-6.5	JC27483-12A	VANADIUM	U	19.2	19.2	6.4		
NFS-PDI-EE15B-8.0-8.5	JC27483-13A	VANADIUM	U	32.8	32.8	5.7		
NFS-PDI-EE15B-0.0-0.5	JC27483-1A	VANADIUM	U	36.4	36.4	5.1		
NFS-PDI-EE15B-10.0-10.5	JC27483-2A	VANADIUM	U	28.5	28.5	5.4		
NFS-PDI-EE15B-11.5-12.0	JC27483-3A	VANADIUM	U	32.4	32.4	5.6		
NFS-PDI-EE15B-12.0-12.5	JC27483-4A	VANADIUM	U	26.7	26.7	5.6		
NFS-PDI-EE15B-14.0-14.5	JC27483-5A	VANADIUM	U	24.2	24.2	5.7		
NFS-PDI-EE15B-16.0-16.5	JC27483-6A	VANADIUM	U	16.2	16.2	6.3		
NFS-PDI-EE15B-18.0-18.5	JC27483-7A	VANADIUM	U	16.5	16.5	5.9		
NFS-PDI-EE15B-2.0-2.5	JC27483-8A	VANADIUM	U	22.1	22.1	11		
NFS-PDI-EE15B-20.0-20.5	JC27483-9A	VANADIUM	U	20.1	20.1	5.8		
NFS-PDI-EE15B-4.0-4.5X	JC27483-10A	ZINC	0.35	948	948	5.7		

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
NFS-PDI-EE15B-4.0-4.5	JC27483-11A	ZINC	0.35	868	868	5.8		
NFS-PDI-EE15B-6.0-6.5	JC27483-12A	ZINC	0.35	60.6	60.6	6.4		
NFS-PDI-EE15B-8.0-8.5	JC27483-13A	ZINC	0.35	38.8	38.8	5.7		
NFS-PDI-EE15B-0.0-0.5	JC27483-1A	ZINC	0.35	33.9	33.9	5.1		
NFS-PDI-EE15B-10.0-10.5	JC27483-2A	ZINC	0.35	130	130	5.4		
NFS-PDI-EE15B-11.5-12.0	JC27483-3A	ZINC	0.35	61.4	61.4	5.6		
NFS-PDI-EE15B-12.0-12.5	JC27483-4A	ZINC	0.35	42.3	42.3	5.6		
NFS-PDI-EE15B-14.0-14.5	JC27483-5A	ZINC	0.35	65.3	65.3	5.7		
NFS-PDI-EE15B-16.0-16.5	JC27483-6A	ZINC	0.35	34.4	34.4	6.3		
NFS-PDI-EE15B-18.0-18.5	JC27483-7A	ZINC	0.35	26.7	26.7	5.9		
NFS-PDI-EE15B-2.0-2.5	JC27483-8A	ZINC	0.35	1540	1540	11		
NFS-PDI-EE15B-20.0-20.5	JC27483-9A	ZINC	0.35	43.8	43.8	5.8		

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

NJDEP Laboratory Footnote

1. The reported values were estimated because the MS and/or MSD recoveries were outside of the QC acceptance criteria.
2. The reported value was qualified due to poor field duplicate precision.
3. The reported result was greater than the MDL but less than the RL and therefore was estimated.

Aqueous Target Analyte Summary Hit List (TAL Metals)

Site Name PPG - North Forest Street PDI
Sampling Date September 13, 2016
Lab Name/ID SGS/Accutest, Dayton, NJ
SDG No JC27483A
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID NFS-FB20160913

Field Sample ID	Lab Sample ID	Analyte	Method Blank (ug/L)	Laboratory Sample Result (ug/L)	Validation Sample Result (ug/L)	RL (ug/L)	Quality Assurance Decision	NJDEP Validation Footnote
NFS-FB20160913	JC27483-25A	ALUMINUM	U	31.0B	31.0	200	Qualify	3
NFS-FB20160913	JC27483-25A	CALCIUM METAL	U	57.3B	57.3	5000	Qualify	3
NFS-FB20160913	JC27483-25A	MANGANESE	U	0.50B	0.50	15	Qualify	3
NFS-FB20160913	JC27483-25A	NICKEL	U	2.2B	2.2	10	Qualify	3
NFS-FB20160913	JC27483-25A	POTASSIUM	U	139B	139	10000	Qualify	3
NFS-FB20160913	JC27483-25A	SODIUM	28.8	167B	167	10000	Qualify	2,3
NFS-FB20160913	JC27483-25A	ZINC	1.5	3.6B	U	20	Negate	1

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

NJDEP Laboratory Footnote

1. The sample result was negated (U) due to method blank contamination.
2. The sample result was qualified (J) due to method blank contamination.
3. The reported result was greater than the MDL but less than the RL and therefore was estimated.

Soil Target Analyte Summary Hit List (VOCs)

Site Name PPG - North Forest Street PDI
Sampling Date September 13, 2016
Lab Name/ID SGS/Accutest, Dayton, NJ
SDG No JC27483A
Sample Matrix Soil
Trip Blank ID NA
Field Blank ID NFS-FB20160913

Field Sample ID	Lab Sample ID	Analyte	Method Blank (ug/kg)	Laboratory Sample Result (ug/kg)	Validation Sample Result (ug/kg)	RL (ug/kg)	Quality Assurance Decision	NJDEP Validation Footnote
NFS-PDI-EE15B-10.0-10.5	JC27483-2A	ETHYLBENZENE	U	0.17J	0.17	0.92	Qualify	3
NFS-PDI-EE15B-10.0-10.5	JC27483-2A	ISOPROPYLBENZENE	U	2.0	2.0	1.8		
NFS-PDI-EE15B-10.0-10.5	JC27483-2A	M+P-XYLENE	U	2.0	2.0	0.92		
NFS-PDI-EE15B-10.0-10.5	JC27483-2A	1,2-DICHLOROBENZENE	U	3.8	3.8	0.92		
NFS-PDI-EE15B-10.0-10.5	JC27483-2A	O-XYLENE	U	5.2	5.2	0.92		
NFS-PDI-EE15B-10.0-10.5	JC27483-2A	2-BUTANONE (MEK)	U	6.7J	6.7	9.2	Qualify	3
NFS-PDI-EE15B-10.0-10.5	JC27483-2A	1,1-DICHLOROETHANE	U	0.44J	0.44	0.92	Qualify	3
NFS-PDI-EE15B-10.0-10.5	JC27483-2A	DICHLOROMETHANE	U	1.1J	1.1	4.6	Qualify	3
NFS-PDI-EE15B-10.0-10.5	JC27483-2A	CARBON DISULFIDE	U	0.43J	0.43	1.8	Qualify	3
NFS-PDI-EE15B-10.0-10.5	JC27483-2A	BENZENE	U	0.68	0.68	0.46		
NFS-PDI-EE15B-10.0-10.5	JC27483-2A	ACETONE	U	28.8	28.8	9.2		
NFS-PDI-EE15B-10.0-10.5	JC27483-2A	XYLENES	U	7.2	7.2	0.92		
NFS-PDI-EE15B-10.0-10.5	JC27483-2A	TETRACHLOROETHENE	U	0.28J	0.28	1.8	Qualify	3
NFS-PDI-EE15B-10.0-10.5	JC27483-2A	CYCLOHEXANE	U	2.5	2.5	1.8		
NFS-PDI-EE15B-10.0-10.5	JC27483-2A	TOLUENE	U	0.59J	0.59	0.92	Qualify	3
NFS-PDI-EE15B-10.0-10.5	JC27483-2A	CHLOROBENZENE	U	0.86J	0.86	1.8	Qualify	3
NFS-PDI-EE15B-10.0-10.5	JC27483-2A	METHYLCYCLOHEXANE	U	8.8	8.8	1.8		

Field Sample ID	Lab Sample ID	Analyte	Method Blank (ug/kg)	Laboratory Sample Result (ug/kg)	Validation Sample Result (ug/kg)	RL (ug/kg)	Quality Assurance Decision	NJDEP Validation Footnote
NFS-PDI-EE15B-10.0-10.5	JC27483-2A	1,4-DICHLOROBENZENE	U	0.36J	0.36	0.92	Qualify	3
NFS-PDI-EE15B-11.5-12.0	JC27483-3A	ACETONE	U	11.5	11.5	9.3		
NFS-PDI-EE15B-12.0-12.5	JC27483-4A	DICHLOROMETHANE	1.3	1.2JB	U	4.6	Negate	1
NFS-PDI-EE15B-12.0-12.5	JC27483-4A	ACETONE	U	12.6	12.6	9.2		
NFS-PDI-EE15B-12.0-12.5	JC27483-4A	TOLUENE	U	0.13J	0.13	0.92	Qualify	3
NFS-PDI-EE15B-14.0-14.5	JC27483-5A	TOLUENE	U	0.12J	0.12	0.96	Qualify	3
NFS-PDI-EE15B-14.0-14.5	JC27483-5A	ACETONE	U	11.5	11.5	9.6		
NFS-PDI-EE15B-14.0-14.5	JC27483-5A	DICHLOROMETHANE	U	1.2J	1.2	4.8	Qualify	3
NFS-PDI-EE15B-16.0-16.5	JC27483-6A	1,4-DICHLOROBENZENE	U	0.24J	0.24	1.1	Qualify	3
NFS-PDI-EE15B-16.0-16.5	JC27483-6A	METHYLCYCLOHEXANE	U	0.72J	0.72	2.2	Qualify	3
NFS-PDI-EE15B-16.0-16.5	JC27483-6A	TOLUENE	U	0.15J	0.15	1.1	Qualify	3
NFS-PDI-EE15B-16.0-16.5	JC27483-6A	TETRACHLOROETHENE	U	0.33J	0.33	2.2	Qualify	3
NFS-PDI-EE15B-16.0-16.5	JC27483-6A	XYLENES	U	0.27J	0.27	1.1	Qualify	3
NFS-PDI-EE15B-16.0-16.5	JC27483-6A	ACETONE	U	15.3	15.3	11		
NFS-PDI-EE15B-16.0-16.5	JC27483-6A	BENZENE	U	0.23J	0.23	0.54	Qualify	3
NFS-PDI-EE15B-16.0-16.5	JC27483-6A	DICHLOROMETHANE	U	1.2J	1.2	5.4	Qualify	3
NFS-PDI-EE15B-16.0-16.5	JC27483-6A	CARBON DISULFIDE	U	1.9J	1.9	2.2	Qualify	3
NFS-PDI-EE15B-16.0-16.5	JC27483-6A	O-XYLENE	U	0.27J	0.27	1.1	Qualify	3
NFS-PDI-EE15B-16.0-16.5	JC27483-6A	1,2-DICHLOROBENZENE	U	0.46J	0.46	1.1	Qualify	3
NFS-PDI-EE15B-18.0-18.5	JC27483-7A	1,4-DICHLOROBENZENE	U	0.47J	0.47	0.94	Qualify	3
NFS-PDI-EE15B-18.0-18.5	JC27483-7A	1,2,4-TRICHLOROBENZENE	U	0.69J	0.69	4.7	Qualify	3
NFS-PDI-EE15B-18.0-18.5	JC27483-7A	M-DICHLOROBENZENE	U	0.21J	0.21	0.94	Qualify	3
NFS-PDI-EE15B-18.0-18.5	JC27483-7A	ACETONE	U	8.4J	8.4	9.4	Qualify	3
NFS-PDI-EE15B-18.0-18.5	JC27483-7A	DICHLOROMETHANE	U	1.2J	1.2	4.7	Qualify	3
NFS-PDI-EE15B-18.0-18.5	JC27483-7A	1,2-DICHLOROBENZENE	U	0.42J	0.42	0.94	Qualify	3

Field Sample ID	Lab Sample ID	Analyte	Method Blank (ug/kg)	Laboratory Sample Result (ug/kg)	Validation Sample Result (ug/kg)	RL (ug/kg)	Quality Assurance Decision	NJDEP Validation Footnote
NFS-PDI-EE15B-2.0-2.5	JC27483-8A	4-METHYL-2-PENTANONE (MIBK)	U	13.3	13.3	7.4		
NFS-PDI-EE15B-2.0-2.5	JC27483-8A	METHYLCYCLOHEXANE	U	2.6J	2.6	2.9	Qualify	3
NFS-PDI-EE15B-2.0-2.5	JC27483-8A	TOLUENE	U	0.24J	0.24	1.5	Qualify	3
NFS-PDI-EE15B-2.0-2.5	JC27483-8A	XYLENES	U	1.5	1.5	1.5		
NFS-PDI-EE15B-2.0-2.5	JC27483-8A	ACETONE	U	89.3	89.3	15		
NFS-PDI-EE15B-2.0-2.5	JC27483-8A	BENZENE	U	0.20J	0.20	0.74	Qualify	3
NFS-PDI-EE15B-2.0-2.5	JC27483-8A	1,1,1-TRICHLOROETHANE	U	0.90J	0.90	2.9	Qualify	3
NFS-PDI-EE15B-2.0-2.5	JC27483-8A	CARBON DISULFIDE	U	0.91J	0.91	2.9	Qualify	3
NFS-PDI-EE15B-2.0-2.5	JC27483-8A	1,1-DICHLOROETHANE	U	21.0	21.0	1.5		
NFS-PDI-EE15B-2.0-2.5	JC27483-8A	2-BUTANONE (MEK)	U	9.1J	9.1	15	Qualify	3
NFS-PDI-EE15B-2.0-2.5	JC27483-8A	O-XYLENE	U	1.0J	1.0	1.5	Qualify	3
NFS-PDI-EE15B-2.0-2.5	JC27483-8A	ISOPROPYLBENZENE	U	0.44J	0.44	2.9	Qualify	3
NFS-PDI-EE15B-2.0-2.5	JC27483-8A	M+P-XYLENE	U	0.46J	0.46	1.5	Qualify	3
NFS-PDI-EE15B-20.0-20.5	JC27483-9A	1,4-DICHLOROBENZENE	U	0.91J	0.91	1.0	Qualify	3
NFS-PDI-EE15B-20.0-20.5	JC27483-9A	CHLOROBENZENE	U	0.20J	0.20	2.0	Qualify	3
NFS-PDI-EE15B-20.0-20.5	JC27483-9A	1,2,4-TRICHLOROBENZENE	U	0.56J	0.56	5.1	Qualify	3
NFS-PDI-EE15B-20.0-20.5	JC27483-9A	TETRACHLOROETHENE	U	2.3	2.3	2.0		
NFS-PDI-EE15B-20.0-20.5	JC27483-9A	CIS-1,2-DICHLOROETHENE	U	3.4	3.4	1.0		
NFS-PDI-EE15B-20.0-20.5	JC27483-9A	METHYL-TERT-BUTYL ETHER	U	0.37J	0.37	1.0	Qualify	3
NFS-PDI-EE15B-20.0-20.5	JC27483-9A	M-DICHLOROBENZENE	U	0.24J	0.24	1.0	Qualify	3
NFS-PDI-EE15B-20.0-20.5	JC27483-9A	DICHLOROMETHANE	U	1.2J	1.2	5.1	Qualify	3
NFS-PDI-EE15B-20.0-20.5	JC27483-9A	1,1-DICHLOROETHANE	U	0.45J	0.45	1.0	Qualify	3
NFS-PDI-EE15B-20.0-20.5	JC27483-9A	1,1-DICHLOROETHYLENE	U	0.55J	0.55	1.0	Qualify	3
NFS-PDI-EE15B-20.0-20.5	JC27483-9A	TRICHLOROETHYLENE	U	0.54J	0.54	1.0	Qualify	3

Field Sample ID	Lab Sample ID	Analyte	Method Blank (ug/kg)	Laboratory Sample Result (ug/kg)	Validation Sample Result (ug/kg)	RL (ug/kg)	Quality Assurance Decision	NJDEP Validation Footnote
NFS-PDI-EE15B-20.0-20.5	JC27483-9A	1,2-DICHLOROBENZENE	U	1.4	1.4	1.0		
NFS-PDI-EE15B-4.0-4.5X	JC27483-10A	METHYLCYCLOHEXANE	U	38.4	38.4	2.2	Qualify	2
NFS-PDI-EE15B-4.0-4.5X	JC27483-10A	TOLUENE	U	0.35J	0.35	1.1	Qualify	3
NFS-PDI-EE15B-4.0-4.5X	JC27483-10A	CYCLOHEXANE	U	1.4J	1.4	2.2	Qualify	3
NFS-PDI-EE15B-4.0-4.5X	JC27483-10A	XYLENES	U	1.6	1.6	1.1		
NFS-PDI-EE15B-4.0-4.5X	JC27483-10A	CIS-1,2-DICHLOROETHENE	U	U	U	1.1	Qualify	2
NFS-PDI-EE15B-4.0-4.5X	JC27483-10A	ACETONE	U	120	120	11		
NFS-PDI-EE15B-4.0-4.5X	JC27483-10A	BENZENE	U	0.60	0.60	0.55		
NFS-PDI-EE15B-4.0-4.5X	JC27483-10A	CHLOROETHANE	U	1.0J	1.0	5.5	Qualify	3
NFS-PDI-EE15B-4.0-4.5X	JC27483-10A	DICHLOROMETHANE	U	1.3J	1.3	5.5	Qualify	3
NFS-PDI-EE15B-4.0-4.5X	JC27483-10A	CARBON DISULFIDE	U	3.1	3.1	2.2		
NFS-PDI-EE15B-4.0-4.5X	JC27483-10A	1,1-DICHLOROETHANE	U	0.24J	0.24	1.1	Qualify	3
NFS-PDI-EE15B-4.0-4.5X	JC27483-10A	2-BUTANONE (MEK)	U	18.6	18.6	11		
NFS-PDI-EE15B-4.0-4.5X	JC27483-10A	O-XYLENE	U	1.3	1.3	1.1		
NFS-PDI-EE15B-4.0-4.5X	JC27483-10A	ISOPROPYLBENZENE	U	1.5J	1.5	2.2	Qualify	3
NFS-PDI-EE15B-4.0-4.5X	JC27483-10A	M+P-XYLENE	U	0.32J	0.32	1.1	Qualify	3
NFS-PDI-EE15B-4.0-4.5	JC27483-11A	ETHYLBENZENE	U	10.1J	10.1	59	Qualify	3
NFS-PDI-EE15B-4.0-4.5	JC27483-11A	METHYLCYCLOHEXANE	U	276	276	120	Qualify	2
NFS-PDI-EE15B-4.0-4.5	JC27483-11A	TOLUENE	U	13.1J	13.1	59	Qualify	3
NFS-PDI-EE15B-4.0-4.5	JC27483-11A	TETRACHLOROETHENE	U	57.7J	57.7	120	Qualify	3
NFS-PDI-EE15B-4.0-4.5	JC27483-11A	XYLENES	U	25.1J	25.1	59	Qualify	3
NFS-PDI-EE15B-4.0-4.5	JC27483-11A	CIS-1,2-DICHLOROETHENE	U	116	116	59	Qualify	2
NFS-PDI-EE15B-4.0-4.5	JC27483-11A	BENZENE	U	13.1J	13.1	30	Qualify	3
NFS-PDI-EE15B-4.0-4.5	JC27483-11A	CARBON DISULFIDE	U	22.5J	22.5	120	Qualify	3
NFS-PDI-EE15B-4.0-4.5	JC27483-11A	1,1-DICHLOROETHANE	U	30.4J	30.4	59	Qualify	3

Field Sample ID	Lab Sample ID	Analyte	Method Blank (ug/kg)	Laboratory Sample Result (ug/kg)	Validation Sample Result (ug/kg)	RL (ug/kg)	Quality Assurance Decision	NJDEP Validation Footnote
NFS-PDI-EE15B-4.0-4.5	JC27483-11A	M+P-XYLENE	U	25.1J	25.1	59	Qualify	3
NFS-PDI-EE15B-6.0-6.5	JC27483-12A	ETHYLBENZENE	U	0.66J	0.66	1.1	Qualify	3
NFS-PDI-EE15B-6.0-6.5	JC27483-12A	METHYLCYCLOHEXANE	U	53.3	53.3	2.2		
NFS-PDI-EE15B-6.0-6.5	JC27483-12A	TOLUENE	U	1.4	1.4	1.1		
NFS-PDI-EE15B-6.0-6.5	JC27483-12A	CHLOROBENZENE	U	3.0	3.0	2.2		
NFS-PDI-EE15B-6.0-6.5	JC27483-12A	CYCLOHEXANE	U	9.5	9.5	2.2		
NFS-PDI-EE15B-6.0-6.5	JC27483-12A	XYLENES	U	27.3	27.3	1.1		
NFS-PDI-EE15B-6.0-6.5	JC27483-12A	ACETONE	U	53.0	53.0	11		
NFS-PDI-EE15B-6.0-6.5	JC27483-12A	BENZENE	U	0.88	0.88	0.55		
NFS-PDI-EE15B-6.0-6.5	JC27483-12A	CHLOROETHANE	U	0.84J	0.84	5.5	Qualify	3
NFS-PDI-EE15B-6.0-6.5	JC27483-12A	DICHLOROMETHANE	1.3	2.0J	2.0	5.5	Negate	1
NFS-PDI-EE15B-6.0-6.5	JC27483-12A	CARBON DISULFIDE	U	0.55J	0.55	2.2	Qualify	3
NFS-PDI-EE15B-6.0-6.5	JC27483-12A	2-BUTANONE (MEK)	U	11.8	11.8	11		
NFS-PDI-EE15B-6.0-6.5	JC27483-12A	O-XYLENE	U	18.5	18.5	1.1		
NFS-PDI-EE15B-6.0-6.5	JC27483-12A	1,2-DICHLOROBENZENE	U	16.3	16.3	1.1		
NFS-PDI-EE15B-6.0-6.5	JC27483-12A	ISOPROPYLBENZENE	U	14.1	14.1	2.2		
NFS-PDI-EE15B-6.0-6.5	JC27483-12A	M+P-XYLENE	U	8.8	8.8	1.1		
NFS-PDI-EE15B-8.0-8.5	JC27483-13A	ACETONE	U	40.9	40.9	10		
NFS-PDI-EE15B-8.0-8.5	JC27483-13A	DICHLOROMETHANE	U	1.3J	1.3	5.2	Qualify	3

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

NJDEP Laboratory Footnote

1. The sample result was negated (U) due to method blank contamination.

2. The reported value was qualified due to poor field duplicate precision.
3. The reported result was greater than the MDL but less than the RL and therefore was estimated.

Soil Target Analyte Summary Hit List (SVOCs)

Site Name PPG - North Forest Street PDI
Sampling Date September 13, 2016
Lab Name/ID SGS/Accutest, Dayton, NJ
SDG No JC27483A
Sample Matrix Soil
Trip Blank ID NA
Field Blank ID NFS-FB20160913

Field Sample ID	Lab Sample ID	Analyte	Method Blank (ug/kg)	Laboratory Sample Result (ug/kg)	Validation Sample Result (ug/kg)	RL (ug/kg)	Quality Assurance Decision	NJDEP Validation Footnote
NFS-PDI-EE15B-0.0-0.5	JC27483-1A	BENZO(A)PYRENE	U	44.9J	44.9	69	Qualify	2
NFS-PDI-EE15B-0.0-0.5	JC27483-1A	BENZO(B)FLUORANTHENE	U	44.8J	44.8	69	Qualify	2
NFS-PDI-EE15B-0.0-0.5	JC27483-1A	INDENO(1,2,3-CD)PYRENE	U	54.5J	54.5	69	Qualify	2
NFS-PDI-EE15B-0.0-0.5	JC27483-1A	BENZO(G,H,I)PERYLENE	U	119	119	69		
NFS-PDI-EE15B-0.0-0.5	JC27483-1A	CHRYSENE	U	73.4J	73.4	140	Qualify	2
NFS-PDI-EE15B-10.0-10.5	JC27483-2A	BENZO(A)ANTHRACENE	U	151	151	38		
NFS-PDI-EE15B-10.0-10.5	JC27483-2A	CHRYSENE	U	221	221	38		
NFS-PDI-EE15B-10.0-10.5	JC27483-2A	PYRENE	U	322	322	38		
NFS-PDI-EE15B-10.0-10.5	JC27483-2A	ANTHRACENE	U	85.1	85.1	75		
NFS-PDI-EE15B-10.0-10.5	JC27483-2A	BENZO(G,H,I)PERYLENE	U	114	114	75		
NFS-PDI-EE15B-10.0-10.5	JC27483-2A	INDENO(1,2,3-CD)PYRENE	U	120	120	75		
NFS-PDI-EE15B-10.0-10.5	JC27483-2A	BENZO(B)FLUORANTHENE	U	154	154	75		
NFS-PDI-EE15B-10.0-10.5	JC27483-2A	FLUORANTHENE	U	207	207	75		
NFS-PDI-EE15B-10.0-10.5	JC27483-2A	BENZO(K)FLUORANTHENE	U	69.8J	69.8	75	Qualify	2
NFS-PDI-EE15B-10.0-10.5	JC27483-2A	BENZO(A)PYRENE	U	157	157	75		
NFS-PDI-EE15B-10.0-10.5	JC27483-2A	ACENAPHTHENE	U	41.8J	41.8	75	Qualify	2
NFS-PDI-EE15B-10.0-10.5	JC27483-2A	PHENANTHRENE	U	261	261	75		

Field Sample ID	Lab Sample ID	Analyte	Method Blank (ug/kg)	Laboratory Sample Result (ug/kg)	Validation Sample Result (ug/kg)	RL (ug/kg)	Quality Assurance Decision	NJDEP Validation Footnote
NFS-PDI-EE15B-10.0-10.5	JC27483-2A	FLUORENE	U	44.1J	44.1	75	Qualify	2
NFS-PDI-EE15B-10.0-10.5	JC27483-2A	NAPHTHALENE	U	96.1	96.1	75		
NFS-PDI-EE15B-10.0-10.5	JC27483-2A	2-METHYLNAPHTHALENE	U	162	162	150		
NFS-PDI-EE15B-2.0-2.5	JC27483-8A	3+4-METHYLPHENOL	U	1150	1150	360		
NFS-PDI-EE15B-2.0-2.5	JC27483-8A	ANTHRACENE	U	885	885	180		
NFS-PDI-EE15B-2.0-2.5	JC27483-8A	1,4-DIOXANE	U	260	260	180		
NFS-PDI-EE15B-2.0-2.5	JC27483-8A	PYRENE	U	1970	1970	180		
NFS-PDI-EE15B-2.0-2.5	JC27483-8A	DIBENZOFURAN	U	316J	316	360	Qualify	2
NFS-PDI-EE15B-2.0-2.5	JC27483-8A	BENZO(G,H,I)PERYLENE	U	386	386	180		
NFS-PDI-EE15B-2.0-2.5	JC27483-8A	INDENO(1,2,3-CD)PYRENE	U	478	478	180		
NFS-PDI-EE15B-2.0-2.5	JC27483-8A	BENZO(B)FLUORANTHENE	U	797	797	180		
NFS-PDI-EE15B-2.0-2.5	JC27483-8A	FLUORANTHENE	U	1630	1630	180		
NFS-PDI-EE15B-2.0-2.5	JC27483-8A	BENZO(K)FLUORANTHENE	U	306	306	180		
NFS-PDI-EE15B-2.0-2.5	JC27483-8A	ACENAPHTHYLENE	U	177J	177	180	Qualify	2
NFS-PDI-EE15B-2.0-2.5	JC27483-8A	CHRYSENE	U	1290	1290	180		
NFS-PDI-EE15B-2.0-2.5	JC27483-8A	BENZO(A)PYRENE	U	661	661	180		
NFS-PDI-EE15B-2.0-2.5	JC27483-8A	DIBENZO(A,H)ANTHRACENE	U	162J	162	180	Qualify	2
NFS-PDI-EE15B-2.0-2.5	JC27483-8A	BENZO(A)ANTHRACENE	U	840	840	180		
NFS-PDI-EE15B-2.0-2.5	JC27483-8A	ACENAPHTHENE	U	791	791	180		
NFS-PDI-EE15B-2.0-2.5	JC27483-8A	PHENANTHRENE	U	3770	3770	180		
NFS-PDI-EE15B-2.0-2.5	JC27483-8A	FLUORENE	U	928	928	180		
NFS-PDI-EE15B-2.0-2.5	JC27483-8A	NAPHTHALENE	U	3840	3840	180		
NFS-PDI-EE15B-2.0-2.5	JC27483-8A	2-METHYLNAPHTHALENE	U	2140	2140	360		
NFS-PDI-EE15B-2.0-2.5	JC27483-8A	1-1'-BIPHENYL	U	376	376	360		
NFS-PDI-EE15B-4.0-4.5X	JC27483-10A	ANTHRACENE	U	64.3	64.3	38		

Field Sample ID	Lab Sample ID	Analyte	Method Blank (ug/kg)	Laboratory Sample Result (ug/kg)	Validation Sample Result (ug/kg)	RL (ug/kg)	Quality Assurance Decision	NJDEP Validation Footnote
NFS-PDI-EE15B-4.0-4.5X	JC27483-10A	PYRENE	U	247	247	38	Qualify	1
NFS-PDI-EE15B-4.0-4.5X	JC27483-10A	DIBENZOFURAN	U	31.9J	31.9	75	Qualify	2
NFS-PDI-EE15B-4.0-4.5X	JC27483-10A	BENZO(G,H,I)PERYLENE	U	58.4	58.4	38		
NFS-PDI-EE15B-4.0-4.5X	JC27483-10A	INDENO(1,2,3-CD)PYRENE	U	69.6	69.6	38		
NFS-PDI-EE15B-4.0-4.5X	JC27483-10A	BENZO(B)FLUORANTHENE	U	127	127	38		
NFS-PDI-EE15B-4.0-4.5X	JC27483-10A	FLUORANTHENE	U	233	233	38	Qualify	1
NFS-PDI-EE15B-4.0-4.5X	JC27483-10A	BENZO(K)FLUORANTHENE	U	42.9	42.9	38		
NFS-PDI-EE15B-4.0-4.5X	JC27483-10A	CHRYSENE	U	152	152	38		
NFS-PDI-EE15B-4.0-4.5X	JC27483-10A	BENZO(A)PYRENE	U	103	103	38	Qualify	1
NFS-PDI-EE15B-4.0-4.5X	JC27483-10A	BENZO(A)ANTHRACENE	U	122	122	38	Qualify	1
NFS-PDI-EE15B-4.0-4.5X	JC27483-10A	ACENAPHTHENE	U	66.5	66.5	38		
NFS-PDI-EE15B-4.0-4.5X	JC27483-10A	PHENANTHRENE	U	246	246	38	Qualify	1
NFS-PDI-EE15B-4.0-4.5X	JC27483-10A	FLUORENE	U	55.9	55.9	38		
NFS-PDI-EE15B-4.0-4.5X	JC27483-10A	CARBAZOLE	U	27.2J	27.2	75	Qualify	2
NFS-PDI-EE15B-4.0-4.5X	JC27483-10A	NAPHTHALENE	U	117	117	38	Qualify	1
NFS-PDI-EE15B-4.0-4.5X	JC27483-10A	2-METHYLNAPHTHALENE	U	120	120	75		
NFS-PDI-EE15B-4.0-4.5X	JC27483-10A	1-1'-BIPHENYL	U	19.3J	19.3	75	Qualify	2
NFS-PDI-EE15B-4.0-4.5	JC27483-11A	ANTHRACENE	U	156	156	36		
NFS-PDI-EE15B-4.0-4.5	JC27483-11A	PYRENE	U	456	456	36	Qualify	1
NFS-PDI-EE15B-4.0-4.5	JC27483-11A	DIBENZOFURAN	U	54.0J	54.0	71	Qualify	2
NFS-PDI-EE15B-4.0-4.5	JC27483-11A	BENZO(G,H,I)PERYLENE	U	106	106	36		
NFS-PDI-EE15B-4.0-4.5	JC27483-11A	INDENO(1,2,3-CD)PYRENE	U	126	126	36		
NFS-PDI-EE15B-4.0-4.5	JC27483-11A	BENZO(B)FLUORANTHENE	U	208	208	36		
NFS-PDI-EE15B-4.0-4.5	JC27483-11A	FLUORANTHENE	U	424	424	36	Qualify	1
NFS-PDI-EE15B-4.0-4.5	JC27483-11A	BENZO(K)FLUORANTHENE	U	87.3	87.3	36		

Field Sample ID	Lab Sample ID	Analyte	Method Blank (ug/kg)	Laboratory Sample Result (ug/kg)	Validation Sample Result (ug/kg)	RL (ug/kg)	Quality Assurance Decision	NJDEP Validation Footnote
NFS-PDI-EE15B-4.0-4.5	JC27483-11A	CHRYSENE	U	250	250	36		
NFS-PDI-EE15B-4.0-4.5	JC27483-11A	BENZO(A)PYRENE	U	193	193	36	Qualify	1
NFS-PDI-EE15B-4.0-4.5	JC27483-11A	DIBENZO(A,H)ANTHRACENE	U	31.2J	31.2	36	Qualify	2
NFS-PDI-EE15B-4.0-4.5	JC27483-11A	BENZO(A)ANTHRACENE	U	224	224	36	Qualify	1
NFS-PDI-EE15B-4.0-4.5	JC27483-11A	ACENAPHTHENE	U	104	104	36		
NFS-PDI-EE15B-4.0-4.5	JC27483-11A	PHENANTHRENE	U	584	584	36	Qualify	1
NFS-PDI-EE15B-4.0-4.5	JC27483-11A	FLUORENE	U	105	105	36		
NFS-PDI-EE15B-4.0-4.5	JC27483-11A	CARBAZOLE	U	52.5J	52.5	71	Qualify	2
NFS-PDI-EE15B-4.0-4.5	JC27483-11A	NAPHTHALENE	U	212	212	36	Qualify	1
NFS-PDI-EE15B-4.0-4.5	JC27483-11A	2-METHYLNAPHTHALENE	U	170	170	71		
NFS-PDI-EE15B-4.0-4.5	JC27483-11A	1-1'-BIPHENYL	U	31.9J	31.9	71	Qualify	2
NFS-PDI-EE15B-6.0-6.5	JC27483-12A	PHENANTHRENE	U	63.1J	63.1	85	Qualify	2
NFS-PDI-EE15B-6.0-6.5	JC27483-12A	NAPHTHALENE	U	37.1J	37.1	85	Qualify	2
NFS-PDI-EE15B-6.0-6.5	JC27483-12A	2-METHYLNAPHTHALENE	U	488	488	170		

Note: A "U" under Method Blank column indicates a nondetect result.
A "U" under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

NJDEP Laboratory Footnote

1. The reported value was qualified due to poor field duplicate precision.
2. The reported result was greater than the MDL but less than the RL and therefore was estimated.

Attachment B

Data Validation Report Form

Client Name: PPG Industries				Project Number: 60314351.GA.DE.PDI.NFS			
Site Location: PPG - North Forest Street PDI, Jersey City, NJ				Project Manager: Aimee Ruitter			
Laboratory: SGS/Accutest, Dayton, NJ				Type of Validation: Limited			
Laboratory Job No: JC27483A				Date Checked: 11/1/2016			
Validator: Paula DiMattei				Peer: Kristin Rutherford			
ITEM	YES	NO	N/A	COMMENTS			
Sample results included?	X						
Reporting Limits met project requirements?	X						
Field I.D. included?	X						
Laboratory I.D. included?	X						
Did data package sample IDs match sample IDs on COC?	X						
Did electronic data deliverable (EDD) sample IDs match COC sample IDs?		X		The sample ID listed on the chain-of-custody for JC 27483-10A, NFS-PDI-EE15B-4.0-4.0X was corrected to NFS-PDI-EE15B-4.0-4.5X after submission of samples to the laboratory.			
Did data package sample IDs match electronic data deliverable (EDD) sample IDs?		X					
Sample matrix included?	X						
Sample receipt temperature 2-6°C?	X			5.1, 4.8 and 4.3°C			
Signed COCs included?	X						
Date of sample collection included?	X						
Date of sample digestion included?	X						
Date of analysis included?	X						
Holding time met QC criteria? (Metals -180 days from sample collection; Mercury - 28 days from sample collection. If HT exceeded by 10 days R all results.	X						
Method reference included?	X						
Laboratory Case Narrative included?	X						
Definitions: MDL - Method Detection Limit; %R - Percent Recovery; RL - Reporting Limit; RPD - Relative Percent Difference; RSD - Relative Standard Deviation :Corr - Correlation Coefficient.							

ITEM	YES	NO	N/A	COMMENTS
Sample dilutions?	X			see table below
Initial calibration documentation included in lab package?			X	N/A for Limited Validation
1) Calibrate daily or each time instrument is set up.			X	
2) ICP (6010) -Blank plus 1 standard?			X	
3) Hg (7470/7471) -Blank plus 5 standards?			X	
Initial Calibration Verification Standard (ICV) for ICP (6010) and Initial Calibration Check Standard (ICCS) for Hg (7470/7471) included in lab package?			X	N/A for Limited Validation
1) Analyzed immediately after initial calibration?			X	
2) %R criteria met? (90-110%)			X	
3) Spot check ICV/ICCS results for several analytes.			X	
Continuing Calibration Verification Standard (CCV) for ICP (6010) and Calibration Check Standard (CCS) for Hg (7470/7471) included in Lab Package?			X	N/A for Limited Validation
1) Analyzed immediately after each ICV/ICC/CB and after every 10 samples?			X	
2) CCS and CCV from independent source and at mid- level of calibration curve.			X	
3) %R criteria met? (90-110%R).			X	
4) Spot check CCV/CCS results for several analytes.			X	
Low Calibration Standard (CRI) included in Lab Package?			X	N/A for Limited Validation
1) %R criteria met?			X	
Calibration Blanks			X	N/A for Limited Validation
1) Analyzed after daily calibration and after each ICV/ICC/CCV/CCS and after every 10 samples?			X	
2) Absolute value <3xIDL?			X	
Method Blank Included in Lab Package?	X			
1) Method blank analyzed with each preparation batch or every SDG, or 1/20 samples?	X			
2) Method blank analyzed 1/20 samples	X			
3) MB results nondetect?		X		see table below
4) Negative MB result reported?		X		
Field Blanks/Equipment Blanks Included in Lab Package?	X			NFS-FB20160913

ITEM	YES	NO	N/A	COMMENTS
1) FB/EB result non-detect?		X		see table below
ICP Interference Check Sample (ICS) included in Lab Package?			X	N/A for Limited Validation
1) Analyzed at beginning of analytical run?			X	
2) %R criteria met? (80-120%)			X	
3) Spot check accuracy of %Rs			X	
Matrix Spike/Matrix Spike Duplicate Data Included in Lab Package?	X			NFS-PDI-EE15B-12.0-12.5
1) MS/MSD %R (75-125%R) and RPD (20%) criteria met?		X		See nonconformances tabulated below
2) Was a sample spiked at the frequency of 1/batch or 20 samples?	X			
3) Was the MS performed on a site sample?	X			Non-project samples were not evaluated
4) Was the MS performed on a FB/EB or TB?		X		
Post Digestion Spike			X	N/A for Limited Validation
1) %R criteria met? (75-125%R)			X	
2) Was the spike performed on a FB/EB or TB?			X	
3) Was a sample spiked at the frequency of 1/batch or 20 samples?			X	
Laboratory Duplicate Data Included in Lab Package?		X		MS/MSD performed in lieu of a laboratory duplicate analysis.
Aqueous - RPD criteria met? (20%)			X	
Soil - RPD criteria met? (35%)			X	
Was a Laboratory Control Sample (LCS) Included in Lab Package?	X			
1) LCS %R criteria met? (80-120%R).	X			
2) Was an LCS analyzed at the frequency of 1/batch or 20 samples?	X			
Serial Dilution			X	N/A for Limited Validation
1) %D (<10%R) criteria met? -			X	
2) Was the frequency 1/batch or 20 samples?			X	
3) Was a site sample used?			X	
4) Was a FB/EB or TB used?			X	
5) Spot check accuracy of %Ds.			X	

ITEM	YES	NO	N/A	COMMENTS
Field Duplicate Data included in Lab Package?	X			NFS-PDI-EE15B-4.0-4.5 and NFS-PDI-EE15B-4.0-4.5X
Aqueous - RPD criteria met?			X	
Soil - RPD criteria met?		X		See nonconformances tabulated below
Percent Solids data included in Lab Package?	X			
1) % Solids criteria (Reg 2 criteria) met? ($\geq 50\%$)	X			
Chromium result greater than corresponding hexavalent chromium result where applicable?	X			Hexavalent chromium reported in JC27483 and JC27483R

Blanks [Bolded analyte results below indicate the maximum blank concentration used for actions]

Field Blank	(ug/l)	(mg/kg)*	3X (mg/kg)	10X (mg/kg)	Associated Samples	Actions^
Aluminum	31.0 J	3.1 J	9.3	31.0	All soil samples	See method blank
Calcium	57.3 J	5.73 J	17.2	57.3		See method blank
Manganese	0.50 J	0.05 J	0.15	0.50		OK, >10X field blank
Nickel	2.2 J	0.22 J	0.66	2.2		OK, >10X field blank
Potassium	139 J	13.9 J	41.7	139		OK, >10X field blank
Sodium	167 J	16.7 J	50.1	167		Qualify (J) results >3X but <10X field blank in samples JC27483-2A, -3A, -4A, -5A, -6A, -7A, -9A, -10A, -11A, -12A, -13A. All others >10X field blank; no qualification.
Zinc#	3.6 J	0.36 J	1.1	3.6		See method blank
<p>*Note: A nominal weight of 1g and nominal final volume of 0.10L (as noted in the laboratory SOP) was used to convert aqueous units (ug/L) to soils units (mg/kg) in the absence of a full data deliverable.</p> <p>#Analyte was subsequently determined to be nondetect due to method blank contamination (see details for Aqueous Method Blank, below).</p>						

***Note: A nominal weight of 1g and nominal final volume of 0.10L (as noted in the laboratory SOP) was used to convert aqueous units (ug/L) to soils units (mg/kg) in the absence of a full data deliverable.**

#Analyte was subsequently determined to be nondetect due to method blank contamination (see details for Aqueous Method Blank, below).

^The Region 2 guidance only addresses blank contamination present in the field blank at concentrations >RL. Professional judgment as noted above was applied in instances where contamination was present in the field blank at concentrations <RL.

Analyte	Result	3X	10X	Associated Samples	Actions
Soil Method Blank	(mg/kg)	(mg/kg)	(mg/kg)		
Aluminum	3.7 J	11.1	37.0	All soil samples	OK, >10X MB
Barium	0.18 J	0.54	1.8		OK, >10X MB
Calcium	11.4 J	34.2	114		OK, >10X MB
Copper	0.26 J	0.78	2.6		OK, >10X MB
Iron	4.1 J	12.3	41.0		OK, >10X MB
Nickel	0.11 J	0.33	1.1		See field blank
Sodium	4.5 J	13.5	45.0		See field blank
Zinc	0.35 J	1.05	3.5		OK, >10X MB

Analyte	Result	3X	10X	Associated Samples	Actions
Aqueous Method Blank ¹	(ug/l)	(ug/l)	(ug/l)		
Iron	18.2 J	54.6	182	NFS-FB20160913	None-ND in associated field blank.
Sodium	28.8 J	86.4	288		>3x but <10X EB Estimate (JB)
Zinc	1.5 J	4.5	15.0		Report as (UB) at RL in associated field blank.

¹Professional judgment was used to apply aqueous method blank actions to the field blank prior to comparison to the soil samples since the levels for contaminants detected in the aqueous method blank were comparable to those detected in the field blank (i.e., results in the associated aqueous method blank were <RL and results in the field blank were <RL)

MS/MSD Results

Sample ID	Analyte	MS % Recovery	MSD % Recovery	Lower QC Limit	Upper QC Limit	Actions*
NFS-PDI-EE15B-12.0-12.5	Aluminum	145.6	179.3	75	125	Estimate (J)
	Antimony	68.2	66.6	75	125	Estimate (UJ)
	Iron	3.5	68.0	75	125	>4x spike concentration; no actions
	Magnesium	72.6	ok	75	125	Estimate (J)

*Per Region 2 Guidance, actions are applied only to the parent sample. Although bias codes are indicated in the Region 2 guidance, bias codes were not applied to the qualified results for project consistency.

Field Duplicate Results

Analyte	RL	5x RL	NFS-PDI-EE15B-4.0-4.5 (mg/kg)	NFS-PDI-EE15B-4.0-4.5X (mg/kg)	RPD	Actions
Lead	2.3	12	413	55.5	153	Estimate (J) in both samples of the field duplicate pair.

Sample Dilutions

Sample ID	Dilution	Analyte
NFS-PDI-EE15B-0.0-0.5	2	IRON
		SELENIUM
		COPPER
		THALLIUM
		SILVER
		MANGANESE
		LEAD
NFS-PDI-EE15B-10.0-10.5	2	IRON
		SELENIUM
		COPPER
		THALLIUM
		SILVER
		MANGANESE
		LEAD
NFS-PDI-EE15B-2.0-2.5	2	MERCURY
		IRON
		LEAD
		MANGANESE
		SILVER
		THALLIUM
		CHROMIUM
		COPPER
		VANADIUM
		ZINC
		SELENIUM

Client Name: PPG Industries		Project Number: 60314351.GA.DE.PDI.NFS		
Site Location: PPG - North Forest Street PDI, Jersey City, NJ		Project Manager: Aimee Ruitter		
Laboratory: SGS/Accutest, Dayton, NJ		Type of Validation: Limited		
Laboratory Job No: JC27483A		Date Checked: 11/1/2016		
Validator: Paula DiMattei		Peer: Kristin Rutherford		
ITEM	YES	NO	N/A	COMMENTS
Sample results included?	X			
Reporting Limits met project requirements?		X		See nonconformance tables
Field I.D. included?	X			
Laboratory I.D. included?	X			
Did data package sample IDs match sample IDs on COC?	X			
Did electronic data deliverable (EDD) sample IDs match COC sample IDs?		X		The sample ID listed on the chain-of-custody for JC 27483-10A, NFS-PDI-EE15B-4.0-4.0X was corrected to NFS-PDI-EE15B-4.0-4.5X after submission of samples to the laboratory.
Did data package sample IDs match electronic data deliverable (EDD) sample IDs?		X		
Sample matrix included?	X			
Sample receipt temperature 2-6°C?	X			5.1, 4.8 and 4.3°C
Signed COCs included?	X			
Date of sample collection included?	X			
Date of analysis included?	X			
Holding time met method criteria?	X			
Method reference included?	X			
Laboratory Case Narrative included?	X			
Definitions: MDL - Method Detection Limit; %R - Percent Recovery; RL - Reporting Limit; RPD - Relative Percent Difference; RSD - Relative Standard Deviation :Corr - Correlation Coefficient.				

ITEM	YES	NO	N/A	COMMENTS
Sample dilutions?		X		No dilutions
Method Blank Included in Lab Package?	X			
1) Method blank analyzed with each preparation batch?	X			
2) Absolute value should not exceed RL.	X			Results did not exceed RL- see table below for compounds present at concentrations <RL.
Trip Blanks/Field Blanks/Equipment Blanks Included in Lab Package?	X			NFS-FB20160913
1) TB/FB/EB results non-detect?	X			
Surrogate Data Included?	X			
1) Is %R criteria (laboratory criteria) met?	X			
Matrix Spike/Matrix Spike Duplicate Data Included in Lab Package?	X			NFS-PDI-EE15B-12.0-12.5
1) %R and RPD (laboratory criteria) met?	X			
2) Was the spike concentration at the same concentration as the LCS?	X			
3) Was a sample spiked at the frequency of 1 per 20 samples?	X			
Was a Laboratory Control Sample (LCS) Included in Lab Package?	X			
1) LCS %R criteria met? (laboratory criteria)	X			
2) Was an LCS analyzed at the frequency of 1/batch or 20 samples?	X			
Field Duplicate Data included in Lab Package?	X			NFS-PDI-EE15B-4.0-4.5/NFS-PDI-EE15B-4.0-4.5X
1) %RPD criteria (Reg 2 criteria) met?		X		Professional judgment was applied since the original sample was analyzed as a medium level soil analysis and the field duplicate was analyzed as a low level soil analysis. See table below for details.
Percent Solids data included in Lab Package?	X			
1) %Solids criteria (Reg 2 criteria) met? (>=50%)	X			

Blanks

Compound	RL	Result (ug/kg)	Associated Samples	Actions
Methylene chloride	5.0	1.3	NFS-PDI-EE15B-12.0-12.5 NFS-PDI-EE15B-6.0-6.5	Report as (U) at RL.

Field Duplicates

Compound	RL	5x RL	NFS-PDI-EE15B-4.0-4.5 (ug/kg) (medium level)	NFS-PDI-EE15B-4.0-4.5X (ug/kg) (low level)	RPD	Actions
ETHYLBENZENE	59	295	10.1 J	1.1 U	NC	One ND, one J-no action
METHYLCYCLOHEXANE	120	600	276	38.4	151.1	Professional judgment to estimate (J) both since the field duplicate result is >5x the low level RL of 2.2 and the original result is >the medium level RL.
TOLUENE	59	295	13.1 J	0.35 J	189.6	Both J-no action
CYCLOHEXANE	120	600	120 U	1.4 J	NC	One ND, one J-no action
TETRACHLOROETHENE	120	600	57.7 J	2.2 U	185.3	One ND, one J-no action
XYLENES	59	295	25.1 J	1.6	176	The conc. detected in the field duplicate is below the MDL of the medium level analysis of the original sample; no actions taken since the medium level conc. is <RL and the conc. detected in the field duplicate is <5x the RL of 1.1 U.

Compound	RL	5x RL	NFS-PDI-EE15B-4.0-4.5 (ug/kg) (medium level)	NFS-PDI-EE15B-4.0-4.5X (ug/kg) (low level)	RPD	Actions
CIS-1,2-DICHLOROETHENE	59	295	116	1.1 U	NC	Professional judgment to estimate (J/UJ) since the conc. in the medium level analysis is >RL and is also significantly higher than the RL of the low level analysis.
ACETONE	590	2950	590 U	120	NC	The conc. detected in the field duplicate is below the MDL of the medium level analysis of the original sample; no actions taken.
BENZENE	30	150	13.1 J	0.6	182.5	The conc. detected in the field duplicate is barely above the RL of 0.55. No actions since both results are well below 5x their respective RLs.
CHLOROETHANE	300	1500	300 U	1.0 J	NC	One ND, one J-no action
METHYLENE CHLORIDE	300	1500	300 U	1.3 J	NC	One ND, one J-no action
CARBON DISULFIDE	120	600	22.5 J	3.1	151.6	The conc. detected in the field duplicate is below the MDL of the medium level analysis of the original sample; no actions taken since the medium level conc. is <RL and the conc. detected in the field duplicate is <5x the RL of 2.2 U.
1,1-DICHLOROETHANE	59	295	30.4 J	0.24 J	196.9	Both J-no action

Compound	RL	5x RL	NFS-PDI-EE15B-4.0-4.5 (ug/kg) (medium level)	NFS-PDI-EE15B-4.0-4.5X (ug/kg) (low level)	RPD	Actions
2-BUTANONE (MEK)	590	2950	590 U	18.6	NC	The conc. detected in the field duplicate is below the MDL of the medium level analysis of the original sample; no actions taken since the medium level conc. is ND and the conc. detected in the field duplicate is <5x the RL of 11 U.
O-XYLENE	59	295	59 U	1.3	NC	The conc. detected in the field duplicate is below the MDL of the medium level analysis of the original sample; no actions taken since the medium level conc. is ND and the conc. detected in the field duplicate is <5x the RL of 1.1 U.
ISOPROPYLBENZENE	120	600	120 U	1.5 J	NC	One ND, one J-no action
M+P-XYLENE	59	295	25.1 J	0.32 J	195	Both J-no action

NC=Not calculable

Reporting Limit Exceedances

Sample ID	Lab ID	Method	Compound	Result	Qualifier	Units	DIGWSSL Action Level
NFS-PDI-EE15B-4.0-4.5	JC27483-11A	SW8260	1,1,2,2-TETRACHLOROETHANE	14	U	ug/kg	7
NFS-PDI-EE15B-4.0-4.5	JC27483-11A	SW8260	1,1-DICHLOROETHYLENE	9.1	U	ug/kg	8
NFS-PDI-EE15B-4.0-4.5	JC27483-11A	SW8260	1,2-DIBROMO-3-CHLOROPROPANE	29	U	ug/kg	5

Sample ID	Lab ID	Method	Compound	Result	Qualifier	Units	DIGWSSL Action Level
			(DBCP)				
NFS-PDI-EE15B-4.0-4.5	JC27483-11A	SW8260	1,2-DIBROMOETHANE(EDB)	14	U	ug/kg	5
NFS-PDI-EE15B-4.0-4.5	JC27483-11A	SW8260	1,2-DICHLOROETHANE	10	U	ug/kg	5
NFS-PDI-EE15B-4.0-4.5	JC27483-11A	SW8260	1,2-DICHLOROPROPANE	18	U	ug/kg	5
NFS-PDI-EE15B-4.0-4.5	JC27483-11A	SW8260	BROMODICHLOROMETHANE	9	U	ug/kg	5
NFS-PDI-EE15B-4.0-4.5	JC27483-11A	SW8260	CARBON TETRACHLORIDE	9.8	U	ug/kg	5
NFS-PDI-EE15B-4.0-4.5	JC27483-11A	SW8260	CHLORODIBROMOMETHANE	8.9	U	ug/kg	5
NFS-PDI-EE15B-4.0-4.5	JC27483-11A	SW8260	CIS-1,3-DICHLOROPROPENE	12	U	ug/kg	5
NFS-PDI-EE15B-4.0-4.5	JC27483-11A	SW8260	DICHLOROMETHANE	59	U	ug/kg	10
NFS-PDI-EE15B-4.0-4.5	JC27483-11A	SW8260	TRANS-1,3-DICHLOROPROPENE	13	U	ug/kg	5
NFS-PDI-EE15B-4.0-4.5	JC27483-11A	SW8260	TRICHLOROETHYLENE	11	U	ug/kg	10
NFS-PDI-EE15B-4.0-4.5	JC27483-11A	SW8260	VINYL CHLORIDE	12	U	ug/kg	5

Sample ID	Lab ID	Method	Compound	Result	Qualifier	Units	RDCSRS Action Level
NFS-PDI-EE15B-4.0-4.5	JC27483-11A	SW8260	1,2-DIBROMOETHANE(EDB)	14	U	ug/kg	8

Client Name: PPG Industries		Project Number: 60314351.GA.DE.PDI.NFS		
Site Location: PPG - North Forest Street PDI, Jersey City, NJ		Project Manager: Aimee Ruitter		
Laboratory: SGS/Accutest, Dayton, NJ		Type of Validation: Limited		
Laboratory Job No: JC27483A		Date Checked: 11/1/2016		
Validator: Paula DiMattei		Peer: Kristin Rutherford		
ITEM	YES	NO	N/A	COMMENTS
Sample results included?	X			
Reporting Limits met project requirements?		X		See nonconformance tables
Field I.D. included?	X			
Laboratory I.D. included?	X			
Did data package sample IDs match sample IDs on COC?	X			
Did electronic data deliverable (EDD) sample IDs match COC sample IDs?		X		The sample ID listed on the chain-of-custody for JC 27483-10A, NFS-PDI-EE15B-4.0-4.0X was corrected to NFS-PDI-EE15B-4.0-4.5X after submission of samples to the laboratory.
Did data package sample IDs match electronic data deliverable (EDD) sample IDs?		X		
Sample matrix included?	X			
Sample receipt temperature 2-6°C?	X			5.1, 4.8 and 4.3°C
Signed COCs included?	X			
Date of sample collection included?	X			
Date of sample extraction included?	X			
Date of analysis included?	X			
Holding time to extraction and analysis met criteria?	X			
Method reference included?	X			
Laboratory Case Narrative included?	X			
Definitions: MDL - Method Detection Limit; %R - Percent Recovery; RL - Reporting Limit; RPD - Relative Percent Difference; RSD - Relative Standard Deviation :Corr - Correlation Coefficient.				

ITEM	YES	NO	N/A	COMMENTS
Sample dilutions?	X			see table below
Method Blank Included in Lab Package?	X			
1) Method blank analyzed with each preparation batch?	X			
2) Absolute value should not exceed RL.	X			
Trip Blanks/Field Blanks/Equipment Blanks Included in Lab Package?	X			NFS-FB20160913
1) TB/FB/EB results non-detect?	X			
Surrogate Data Included?	X			
1) Is %R criteria (laboratory criteria) met?	X			
Matrix Spike/Matrix Spike Duplicate Data Included in Lab Package?	X			NFS-PDI-EE15B-12.0-12.5
1) %R and RPD (laboratory criteria) met?	X			
2) Was the spike concentration at the same concentration as the LCS?	X			
3) Was a sample spiked at the frequency of 1 per 20 samples?	X			
Was a Laboratory Control Sample (LCS) Included in Lab Package?	X			
1) LCS %R criteria met? (laboratory criteria)	X			
2) Was an LCS analyzed at the frequency of 1/batch or 20 samples?	X			
Field Duplicate Data included in Lab Package?	X			NFS-PDI-EE15B-4.0-4.5/NFS-PDI-EE15B-4.0-4.5X
1) %RPD criteria (Reg 2 criteria) met?		X		See table below for RPDs >50%.
Percent Solids data included in Lab Package?	X			
1) %Solids criteria (Reg 2 criteria) met? (>=50%)	X			

Sample Dilutions

Sample	Compound	Dilution
NFS-PDI-EE15B-6.0-6.5	All compounds	2
NFS-PDI-EE15B-0.0-0.5	All compounds	2
NFS-PDI-EE15B-10.0-10.5	1-1'-BIPHENYL 2-METHYLNAPHTHALENE NAPHTHALENE FLUORENE CARBAZOLE PHENANTHRENE ACENAPHTHENE BENZO(A)PYRENE ACENAPHTHYLENE BENZO(K)FLUORANTHENE BENZO(B)FLUORANTHENE FLUORANTHENE INDENO(1,2,3-CD)PYRENE DIBENZOFURAN BENZO(G,H,I)PERYLENE ANTHRACENE	2
NFS-PDI-EE15B-2.0-2.5	All compounds	5

Field Duplicates

Compound	RL	5x RL	NFS-PDI-EE15B-4.0-4.5 (ug/kg)	NFS-PDI-EE15B-4.0-4.5X (ug/kg)	RPD	Actions
PYRENE	36	180	456	247	59.5	Estimate (J) in both samples of the field duplicate pair.
FLUORANTHENE	36	180	424	233	58.1	
BENZO(A)PYRENE	36	180	193	103	60.8	
BENZO(A)ANTHRACENE	36	180	224	122	59.0	
PHENANTHRENE	36	180	584	246	81.4	
NAPHTHALENE	36	180	212	117	57.8	

Reporting Limit Exceedances

Sample ID	Lab ID	Method	Compound	Result	Qualifier	Units	DIGWSSL Action Level
NFS-PDI-EE15B-2.0-2.5	JC27483-8A	SW8270	2,4-DINITROPHENOL	680	U	ug/kg	300
NFS-PDI-EE15B-6.0-6.5	JC27483-12A	SW8270	2,4-DINITROPHENOL	320	U	ug/kg	300

Data Validation Report

Project:	PPG - North Forest Street PDI
Laboratory:	SGS/Accutest, Dayton, NJ
Laboratory Job No.:	JC27616 and JC27616R
Analysis/Method:	Hexavalent Chromium SW846 3060A/7196A
Validation Level:	Full
Site Location/Address:	70 Carteret Avenue
AECOM Project No:	60314351.GA.DE.PDI.NFS
Prepared by:	Charlene Livingston Flint /AECOM
Completed on:	10/14/2016
Reviewed by:	Constance Lapite /AECOM
File Name:	JC27616_R_2016-10-14_DVReport-F

Introduction

The data were reviewed in accordance with the FSP-QAPP and the following NJDEP validation Standard Operating Procedure (SOP):

- NJDEP Office of Data Quality SOP 5.A.10, Rev 3 (September 2009), SOP for Analytical Data Validation of Hexavalent Chromium - for USEPA SW-846 Method 3060A, USEPA SW-846 Method 7196A and USEPA SW-846 Method 7199;

The results of quality control data analyzed with site samples were used to assess the overall reliability of the data. The following qualifiers were used to identify data quality issues:

- U: Indicates the analyte was not detected in the sample above the sample reporting limit.
- J: Indicates the result was an estimated value; the associated numerical value was an approximate concentration of the analyte in the sample.
- UJ: Indicates the analyte was not detected above the reporting limit and the reporting limit was approximate.
- UB: The analyte concentration is less than or equal to three (3) times the concentration in the associated method/prep blank. The presence of the analyte in the sample is negated (UB) due to laboratory contamination.
- JB: The analyte concentration is greater than three (3) times, but less than or equal to ten (10) times the concentration in the associated method/prep blank. The presence of that analyte in the sample is considered "real". The concentration is quantitatively qualified (JB) due to method blank contamination.
- R: The sample result was rejected due to serious deficiencies; the presence or absence of the analyte could not be confirmed.

RA: The sample result was rejected but is still considered usable.

Sample Information

The samples listed below were collected by AECOM on September 14, 2016 as part of the PPG - North Forest Street PDI sampling at 70 Carteret Avenue, Jersey City, New Jersey. Only the samples and parameters listed below were validated.

Field ID	Laboratory ID	Matrix	Fraction
NFS-FB20160914 (Equipment Blank)	JC27616-1	Aqueous	Hexavalent Chromium
NFS-PDI-AA13B-0.5-1.0	JC27616-2	Soil	Hexavalent Chromium
NFS-PDI-AA13B-0.5-1.0	JC27616-2R	Soil	Hexavalent Chromium
NFS-PDI-AA13B-10.0-10.5	JC27616-3	Soil	Hexavalent Chromium
NFS-PDI-AA13B-10.0-10.5	JC27616-3R	Soil	Hexavalent Chromium
NFS-PDI-AA13B-12.0-12.5	JC27616-4	Soil	Hexavalent Chromium
NFS-PDI-AA13B-12.0-12.5	JC27616-4R	Soil	Hexavalent Chromium
NFS-PDI-AA13B-14.0-14.5	JC27616-5	Soil	Hexavalent Chromium
NFS-PDI-AA13B-14.0-14.5	JC27616-5R	Soil	Hexavalent Chromium
NFS-PDI-AA13B-16.0-16.5	JC27616-6	Soil	Hexavalent Chromium
NFS-PDI-AA13B-16.0-16.5	JC27616-6R	Soil	Hexavalent Chromium
NFS-PDI-AA13B-18.0-18.5	JC27616-7	Soil	Hexavalent Chromium
NFS-PDI-AA13B-18.0-18.5	JC27616-7R	Soil	Hexavalent Chromium
NFS-PDI-AA13B-2.0-2.5	JC27616-8	Soil	Hexavalent Chromium
NFS-PDI-AA13B-2.0-2.5	JC27616-8R	Soil	Hexavalent Chromium
NFS-PDI-AA13B-20.0-20.5	JC27616-9	Soil	Hexavalent Chromium
NFS-PDI-AA13B-20.0-20.5	JC27616-9R	Soil	Hexavalent Chromium
NFS-PDI-AA13B-4.0-4.5	JC27616-10	Soil	Hexavalent Chromium
NFS-PDI-AA13B-4.0-4.5	JC27616-10R	Soil	Hexavalent Chromium
NFS-PDI-AA13B-5.5-6.0	JC27616-11	Soil	Hexavalent Chromium
NFS-PDI-AA13B-5.5-6.0	JC27616-11R	Soil	Hexavalent Chromium
NFS-PDI-AA13B-6.0-6.5	JC27616-12	Soil	Hexavalent Chromium
NFS-PDI-AA13B-6.0-6.5	JC27616-12R	Soil	Hexavalent Chromium
NFS-PDI-AA13B-8.0-8.5	JC27616-13	Soil	Hexavalent Chromium
NFS-PDI-AA13B-8.0-8.5	JC27616-13R	Soil	Hexavalent Chromium
NFS-PDI-CC13B-0.1-0.6	JC27616-14	Soil	Hexavalent Chromium
NFS-PDI-CC13B-0.1-0.6	JC27616-14R	Soil	Hexavalent Chromium
NFS-PDI-CC13B-10.0-10.5	JC27616-15	Soil	Hexavalent Chromium
NFS-PDI-CC13B-10.0-10.5	JC27616-15R	Soil	Hexavalent Chromium
NFS-PDI-CC13B-12.0-12.5	JC27616-16	Soil	Hexavalent Chromium
NFS-PDI-CC13B-12.0-12.5	JC27616-16R	Soil	Hexavalent Chromium
NFS-PDI-CC13B-14.0-14.5	JC27616-17	Soil	Hexavalent Chromium
NFS-PDI-CC13B-14.0-14.5	JC27616-17R	Soil	Hexavalent Chromium
NFS-PDI-CC13B-16.0-16.5	JC27616-18	Soil	Hexavalent Chromium

Field ID	Laboratory ID	Matrix	Fraction
NFS-PDI-CC13B-16.0-16.5	JC27616-18R	Soil	Hexavalent Chromium
NFS-PDI-CC13B-18.0-18.5	JC27616-19	Soil	Hexavalent Chromium
NFS-PDI-CC13B-18.0-18.5	JC27616-19R	Soil	Hexavalent Chromium
NFS-PDI-CC13B-2.0-2.5	JC27616-20	Soil	Hexavalent Chromium
NFS-PDI-CC13B-2.0-2.5	JC27616-20R	Soil	Hexavalent Chromium
NFS-PDI-CC13B-20.0-20.5	JC27616-21	Soil	Hexavalent Chromium
NFS-PDI-CC13B-20.0-20.5	JC27616-21R	Soil	Hexavalent Chromium
NFS-PDI-CC13B-4.0-4.5	JC27616-22	Soil	Hexavalent Chromium
NFS-PDI-CC13B-6.0-6.5	JC27616-23	Soil	Hexavalent Chromium
NFS-PDI-CC13B-7.5-8.0	JC27616-24	Soil	Hexavalent Chromium
NFS-PDI-CC13B-8.0-8.5	JC27616-25	Soil	Hexavalent Chromium
NFS-PDI-CC13B-8.0-8.5X (Field Duplicate of NFS-PDI-CC13B-8.0-8.5)	JC27616-26	Soil	Hexavalent Chromium
NFS-PDI-CC15B-0.2-0.7	JC27616-27	Soil	Hexavalent Chromium
NFS-PDI-CC15B-10.0-10.5	JC27616-28	Soil	Hexavalent Chromium
NFS-PDI-CC15B-12.0-12.5	JC27616-29	Soil	Hexavalent Chromium
NFS-PDI-CC15B-14.0-14.5	JC27616-30	Soil	Hexavalent Chromium
NFS-PDI-CC15B-14.0-14.5X (Field Duplicate of NFS-PDI-CC15B-14.0-14.5)	JC27616-31	Soil	Hexavalent Chromium
NFS-PDI-CC15B-16.0-16.5	JC27616-32	Soil	Hexavalent Chromium
NFS-PDI-CC15B-18.0-18.5	JC27616-33	Soil	Hexavalent Chromium
NFS-PDI-CC15B-2.0-2.5	JC27616-34	Soil	Hexavalent Chromium
NFS-PDI-CC15B-20.0-20.5	JC27616-35	Soil	Hexavalent Chromium
NFS-PDI-CC15B-4.0-4.5	JC27616-36	Soil	Hexavalent Chromium
NFS-PDI-CC15B-6.0-6.5	JC27616-37	Soil	Hexavalent Chromium
NFS-PDI-CC15B-8.0-8.5	JC27616-38	Soil	Hexavalent Chromium
NFS-PDI-CC15B-8.5-9.0	JC27616-39	Soil	Hexavalent Chromium
NFS-PDI-CC15B-9.0-9.5	JC27616-40	Soil	Hexavalent Chromium

The samples were collected following the procedures detailed in the Work Order for Garfield Avenue Remedial Action (GARA) at 70 Carteret Avenue and the Field Sampling Plan/Quality Assurance Project Plan for Non-Residential and Residential Chromium Sites Hudson County, New Jersey (December 2011).

General Comments

The data package was complete. Quality control (QC) issues identified during validation are discussed below. Refer to the Target Analyte Summary Hit(s) in Attachment A for a listing of all detected results, qualified results, and associated qualifications, where applicable. The nonconformances for each section discussed below are presented in Attachment B.

MS Results

Two matrix spike (MS) samples, NFS-PDI-CC13B-14.0-14.5 (JC27616-17) and NFS-PDI-CC15B-14.0-14.5 (JC27616-30), were analyzed with the samples in this SDG and were used for supporting data quality recommendations. MS samples are associated with field samples using matrix similarities as the primary criteria, then by analytical preparation batch when no matrix match is possible. The following table summarizes each of the MS samples and field samples associated with each, differentiating between those associated by matrix, and those associated by batch.

Spiked Sample	Samples Associated by Matrix	Samples Associated by Batch
NFS-PDI-CC13B-14.0-14.5 (JC27616-17)	NFS-PDI-CC13B-10.0-10.5 (JC27616-15) NFS-PDI-CC13B-12.0-12.5 (JC27616-16) NFS-PDI-CC13B-8.0-8.5 (JC27616-25) NFS-PDI-CC13B-8.0-8.5X (JC27616-26)	NFS-PDI-AA13B-0.5-1.0 (JC27616-2) NFS-PDI-AA13B-10.0-10.5 (JC27616-3) NFS-PDI-AA13B-12.0-12.5 (JC27616-4) NFS-PDI-AA13B-2.0-2.5 (JC27616-8) NFS-PDI-AA13B-4.0-4.5 (JC27616-10) NFS-PDI-AA13B-5.5-6.0 (JC27616-11) NFS-PDI-AA13B-6.0-6.5 (JC27616-12) NFS-PDI-AA13B-8.0-8.5 (JC27616-13) NFS-PDI-CC13B-0.1-0.6 (JC27616-14) NFS-PDI-CC13B-14.0-14.5 (JC27616-17) NFS-PDI-CC13B-2.0-2.5 (JC27616-20)
NFS-PDI-CC15B-14.0-14.5 (JC27616-30)	NFS-PDI-AA13B-14.0-14.5 (JC27616-5) NFS-PDI-AA13B-16.0-16.5 (JC27616-6) NFS-PDI-AA13B-18.0-18.5 (JC27616-7) NFS-PDI-AA13B-20.0-20.5 (JC27616-9) NFS-PDI-CC13B-16.0-16.5 (JC27616-18) NFS-PDI-CC13B-18.0-18.5 (JC27616-19) NFS-PDI-CC13B-20.0-20.5 (JC27616-21) NFS-PDI-CC15B-10.0-10.5 (JC27616-28) NFS-PDI-CC15B-12.0-12.5 (JC27616-29) NFS-PDI-CC15B-14.0-14.5 (JC27616-30) NFS-PDI-CC15B-14.0-14.5X (JC27616-31) NFS-PDI-CC15B-16.0-16.5 (JC27616-32) NFS-PDI-CC15B-18.0-18.5 (JC27616-33) NFS-PDI-CC15B-20.0-20.5 (JC27616-35) NFS-PDI-CC15B-9.0-9.5 (JC27616-40)	NFS-PDI-CC13B-4.0-4.5 (JC27616-22) NFS-PDI-CC13B-6.0-6.5 (JC27616-23) NFS-PDI-CC13B-7.5-8.0 (JC27616-24) NFS-PDI-CC15B-0.2-0.7 (JC27616-27) NFS-PDI-CC15B-2.0-2.5 (JC27616-34) NFS-PDI-CC15B-4.0-4.5 (JC27616-36) NFS-PDI-CC15B-6.0-6.5 (JC27616-37) NFS-PDI-CC15B-8.0-8.5 (JC27616-38) NFS-PDI-CC15B-8.5-9.0 (JC27616-39)

MS sample NFS-PDI-CC13B-14.0-14.5 (JC27616-17)

For the MS on sample NFS-PDI-CC13B-14.0-14.5, associated with samples as noted above, the soluble and insoluble MS recoveries from the initial batch were 61.8% and 101.6%, respectively. The soluble MS recovery did not meet quality control (QC) criteria of 75-125%R and exceeded the QC limit. The post digestion spike (PDS) recovery was 93.99%, which met the PDS criteria of 85-115%.

Based on the soluble MS recovery, the MS and associated samples were reanalyzed using Method 7196. The soluble and insoluble matrix spike recoveries were 87.0% and 100.7%, respectively; which met the QC criteria of 75-125%R. The PDS result was 92% which met the PDS criteria of 85-115%. No data qualification was required on the basis of spike recoveries.

MS sample *NFS-PDI-CC15B-14.0-14.5 (JC27616-30)*

Sample NFS-PDI-CC15B-14.0-14.5, associated with samples as noted above, was selected for the MS analysis and was used for supporting data quality recommendations. The soluble and insoluble MS recoveries were 98.0% and 91.6%, respectively; which met the quality control criteria of 75-125%. The post digestion spike (PDS) recovery was 95.01%, which met the PDS criteria of 85-115%. No data qualification was required on the basis of spike recoveries.

Field Duplicate Results

Two field duplicate pairs, NFS-PDI-CC13B-8.0-8.5 (JC27616-25), NFS-PDI-CC13B-8.0-8.5 (JC27616-26) and NFS-PDI-CC15B-14.0-14.5 (JC27616-30), NFS-PDI-CC15B-14.0-14.5X (JC27616-31), are associated with the samples in this SDG and were used for supporting data quality recommendations. Field duplicate samples are associated with field samples using matrix similarities as the primary criteria, then by analytical preparation batch when no matrix match is possible. The following table summarizes each of the field duplicate samples and field samples associated with each, differentiating between those associated by matrix, and those associated by batch.

Field Duplicate Sample	Samples Associated for Matrix	Samples Associated by Batch
NFS-PDI-CC13B-8.0-8.5/ NFS-PDI-CC13B-8.0-8.5 (JC27616-25/26)	NFS-PDI-CC13B-10.0-10.5 (JC27616-15) NFS-PDI-CC13B-12.0-12.5 (JC27616-16) NFS-PDI-CC13B-14.0-14.5 (JC27616-17)	NFS-PDI-AA13B-0.5-1.0 (JC27616-2) NFS-PDI-AA13B-10.0-10.5 (JC27616-3) NFS-PDI-AA13B-12.0-12.5 (JC27616-4) NFS-PDI-AA13B-2.0-2.5 (JC27616-8) NFS-PDI-AA13B-4.0-4.5 (JC27616-10) NFS-PDI-AA13B-5.5-6.0 (JC27616-11) NFS-PDI-AA13B-6.0-6.5 (JC27616-12) NFS-PDI-AA13B-8.0-8.5 (JC27616-13) NFS-PDI-CC13B-0.1-0.6 (JC27616-14) NFS-PDI-CC13B-2.0-2.5 (JC27616-20)
NFS-PDI-CC15B-14.0- 14.5/ NFS-PDI-CC15B- 14.0-14.5X (JC27616- 30/31)	NFS-PDI-AA13B-14.0-14.5 (JC27616-5) NFS-PDI-AA13B-16.0-16.5 (JC27616-6) NFS-PDI-AA13B-18.0-18.5 (JC27616-7) NFS-PDI-AA13B-20.0-20.5 (JC27616-9) NFS-PDI-CC13B-16.0-16.5 (JC27616-18) NFS-PDI-CC13B-18.0-18.5 (JC27616-19) NFS-PDI-CC13B-20.0-20.5 (JC27616-21) NFS-PDI-CC15B-10.0-10.5 (JC27616-28) NFS-PDI-CC15B-12.0-12.5 (JC27616-29) NFS-PDI-CC15B-16.0-16.5 (JC27616-32) NFS-PDI-CC15B-18.0-18.5 (JC27616-33) NFS-PDI-CC15B-20.0-20.5 (JC27616-35) NFS-PDI-CC15B-9.0-9.5 (JC27616-40)	NFS-PDI-CC13B-4.0-4.5 (JC27616-22) NFS-PDI-CC13B-6.0-6.5 (JC27616-23) NFS-PDI-CC13B-7.5-8.0 (JC27616-24) NFS-PDI-CC15B-0.2-0.7 (JC27616-27) NFS-PDI-CC15B-2.0-2.5 (JC27616-34) NFS-PDI-CC15B-4.0-4.5 (JC27616-36) NFS-PDI-CC15B-6.0-6.5 (JC27616-37) NFS-PDI-CC15B-8.0-8.5 (JC27616-38) NFS-PDI-CC15B-8.5-9.0 (JC27616-39)

The field duplicate pair NFS-PDI-CC13B-8.0-8.5/ NFS-PDI-CC13B-8.0-8.5, associated with samples as noted above, met all QC criteria. No qualifications were made.

The relative percent difference for the reported hexavalent chromium field duplicate results in field duplicate pair NFS-PDI-CC15B-14.0-14.5/ NFS-PDI-CC15B-14.0-14.5X, associated with samples as noted above, exceeded the QC acceptance RPD; therefore, the reported hexavalent chromium results in the associated soil sample, as noted above, were qualified as estimated (J/UJ).

Sample Results

Reported results (flagged B by the laboratory) that were less than the reporting limit (RL), but greater than or equal to the method detection limit (MDL) are approximate values and have been qualified as estimated (J).

Sample NFS-PDI-CC13B-2.0-2.5 (JC27616-20) had results that significantly differed between the initial analysis and reanalysis, such that one result exceeded the project action limit of 20 mg/kg. The highest detected hexavalent chromium result between the initial analysis and reanalysis was reported for each sample in this SDG.

Data Quality and Usability

In general, these data appear to be valid and may be used for decision-making purposes. No data were rejected. Qualified results, if applicable, are presented in Attachments A and B.

Sample results qualified due to poor field duplicate precision are usable as estimated values with an unknown directional bias.

Sample NFS-PDI-CC13B-2.0-2.5 (JC27616-20) had results that significantly differed between the initial analysis and reanalysis, such that one result exceeded the project action limit of 20 mg/kg. The highest detected hexavalent chromium result between the initial analysis and reanalysis was reported for each sample in this SDG.

Sample results reported between the MDL and RL are usable as estimated values with an unknown directional bias.

ATTACHMENTS

Attachment A: Target Analyte Summary Hitlist(s)

Attachment B: Data Validation Report Form

Attachment A

Target Analyte Summary Hitlist(s)

Soil Target Analyte Summary Hit List (Hexavalent Chromium)

Site Name PPG - North Forest Street PDI
Sampling Date September 14, 2016
Lab Name/ID SGS/Accutest, Dayton, NJ
SDG No JC27616 and JC27616R
Sample Matrix Soil
Trip Blank ID NA
Field Blank ID NFS-FB20160914

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
NFS-PDI-AA13B-0.5-1.0	JC27616-2	CHROMIUM (HEXAVALENT)	U	1.1	1.1	0.46		
NFS-PDI-AA13B-10.0-10.5	JC27616-3	CHROMIUM (HEXAVALENT)	U	0.79	0.79	0.48		
NFS-PDI-AA13B-12.0-12.5	JC27616-4	CHROMIUM (HEXAVALENT)	U	0.39B	0.39	0.55	Qualify	2
NFS-PDI-AA13B-14.0-14.5	JC27616-5R	CHROMIUM (HEXAVALENT)	U	8.1	8.1	0.50	Qualify	1
NFS-PDI-AA13B-16.0-16.5	JC27616-6	CHROMIUM (HEXAVALENT)	U	6.3	6.3	0.47	Qualify	1
NFS-PDI-AA13B-18.0-18.5	JC27616-7R	CHROMIUM (HEXAVALENT)	U	13.0	13.0	0.46	Qualify	1
NFS-PDI-AA13B-2.0-2.5	JC27616-8	CHROMIUM (HEXAVALENT)	U	2.2	2.2	0.48		
NFS-PDI-AA13B-20.0-20.5	JC27616-9	CHROMIUM (HEXAVALENT)	U	7.8	7.8	0.46	Qualify	1
NFS-PDI-AA13B-4.0-4.5	JC27616-10R	CHROMIUM (HEXAVALENT)	U	0.67	0.67	0.47		
NFS-PDI-AA13B-5.5-6.0	JC27616-11R	CHROMIUM (HEXAVALENT)	U	0.74	0.74	0.58		
NFS-PDI-AA13B-6.0-6.5	JC27616-12R	CHROMIUM (HEXAVALENT)	U	1.6	1.6	0.53		
NFS-PDI-AA13B-8.0-8.5	JC27616-13R	CHROMIUM (HEXAVALENT)	U	0.87	0.87	0.52		
NFS-PDI-CC13B-0.1-0.6	JC27616-14	CHROMIUM (HEXAVALENT)	U	7.9	7.9	0.42		
NFS-PDI-CC13B-10.0-10.5	JC27616-15	CHROMIUM (HEXAVALENT)	U	3.8	3.8	0.46		
NFS-PDI-CC13B-12.0-12.5	JC27616-16	CHROMIUM (HEXAVALENT)	U	4.0	4.0	0.49		
NFS-PDI-CC13B-14.0-14.5	JC27616-17R	CHROMIUM (HEXAVALENT)	U	4.3	4.3	0.50		
NFS-PDI-CC13B-16.0-16.5	JC27616-18	CHROMIUM (HEXAVALENT)	U	5.5	5.5	0.48	Qualify	1
NFS-PDI-CC13B-18.0-18.5	JC27616-19R	CHROMIUM (HEXAVALENT)	U	2.9	2.9	0.46	Qualify	1

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
NFS-PDI-CC13B-2.0-2.5	JC27616-20R	CHROMIUM (HEXAVALENT)	U	21.4	21.4	0.53		
NFS-PDI-CC13B-20.0-20.5	JC27616-21	CHROMIUM (HEXAVALENT)	U	16.8	16.8	0.44	Qualify	1
NFS-PDI-CC13B-4.0-4.5	JC27616-22	CHROMIUM (HEXAVALENT)	U	1.1	1.1	0.51	Qualify	1
NFS-PDI-CC13B-6.0-6.5	JC27616-23	CHROMIUM (HEXAVALENT)	U	0.37B	0.37	0.51	Qualify	1,2
NFS-PDI-CC13B-7.5-8.0	JC27616-24	CHROMIUM (HEXAVALENT)	U	63.3	63.3	2.5	Qualify	1
NFS-PDI-CC13B-8.0-8.5	JC27616-25	CHROMIUM (HEXAVALENT)	U	27.4	27.4	0.48		
NFS-PDI-CC13B-8.0-8.5X	JC27616-26	CHROMIUM (HEXAVALENT)	U	26.2	26.2	0.47		
NFS-PDI-CC15B-0.2-0.7	JC27616-27	CHROMIUM (HEXAVALENT)	U	24.1	24.1	0.48	Qualify	1
NFS-PDI-CC15B-10.0-10.5	JC27616-28	CHROMIUM (HEXAVALENT)	U	U	U	0.53	Qualify	1
NFS-PDI-CC15B-12.0-12.5	JC27616-29	CHROMIUM (HEXAVALENT)	U	0.58	0.58	0.48	Qualify	1
NFS-PDI-CC15B-14.0-14.5	JC27616-30	CHROMIUM (HEXAVALENT)	U	0.60	0.60	0.46		
NFS-PDI-CC15B-14.0-14.5X	JC27616-31	CHROMIUM (HEXAVALENT)	U	1.2	1.2	0.47		
NFS-PDI-CC15B-16.0-16.5	JC27616-32	CHROMIUM (HEXAVALENT)	U	2.0	2.0	0.47	Qualify	1
NFS-PDI-CC15B-18.0-18.5	JC27616-33	CHROMIUM (HEXAVALENT)	U	3.4	3.4	0.45	Qualify	1
NFS-PDI-CC15B-2.0-2.5	JC27616-34	CHROMIUM (HEXAVALENT)	U	2.1	2.1	0.47	Qualify	1
NFS-PDI-CC15B-20.0-20.5	JC27616-35	CHROMIUM (HEXAVALENT)	U	4.0	4.0	0.46	Qualify	1
NFS-PDI-CC15B-4.0-4.5	JC27616-36	CHROMIUM (HEXAVALENT)	U	0.34B	0.34	0.47	Qualify	1,2
NFS-PDI-CC15B-6.0-6.5	JC27616-37	CHROMIUM (HEXAVALENT)	U	0.47B	0.47	0.54	Qualify	1,2
NFS-PDI-CC15B-8.0-8.5	JC27616-38	CHROMIUM (HEXAVALENT)	U	0.58	0.58	0.54	Qualify	1
NFS-PDI-CC15B-8.5-9.0	JC27616-39	CHROMIUM (HEXAVALENT)	U	0.37B	0.37	0.52	Qualify	1,2
NFS-PDI-CC15B-9.0-9.5	JC27616-40	CHROMIUM (HEXAVALENT)	U	0.44B	0.44	0.51	Qualify	1,2

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

NJDEP Laboratory Footnote

1. In the Field Duplicate Sample Analysis, Hexavalent Chromium fell outside the control limits of $\leq 20\%$ for sample results $> 4 \times \text{RL}$ or $+ \text{RL}$ for sample results $< 4 \times \text{RL}$. Therefore, the result was qualified.
2. The reported result was greater than the MDL but less than the RL and therefore was estimated.

Attachment B

Data Validation Report Form

Client Name: PPG Industries	Project Number: 60314351.GA.DE.PDI.NFS
Site Location: PPG - North Forest Street PDI, Jersey City, NJ	Project Manager: Lindi Higgins
Laboratory: SGS/Accutest, Dayton, NJ	Type of Validation: Full
Laboratory Job No: JC27616 and JC27616R	Date Checked: 10/14/2016
Validator: Charlene Livingston Flint	Peer: Constance Lapite

ITEM	YES	NO	N/A	COMMENTS
Sample results included?	X			
Reporting Limits met project requirements?	X			
Field I.D. included?	X			
Laboratory I.D. included?	X			
Did data package sample IDs match sample IDs on COC?	X			
Did electronic data deliverable (EDD) sample IDs match COC sample IDs?	X			
Did data package sample IDs match electronic data deliverable (EDD) sample IDs?	X			
Sample matrix included?	X			
Sample receipt temperature 2-6°C?	X			5.5° C
Signed COCs included?	X			
Date of sample collection included?	X			
Date of sample digestion included?	X			
Holding time to digestion met criteria? (Soils -30 days from collection to digestion.)	X			
Date of analysis included?	X			
Holding time to analysis met criteria? (Soils -168 hours from digestion to analysis; Aqueous - 24 hours from collection to analysis.)	X			
Method reference included?	X			
Laboratory Case Narrative included?	X			

Definitions: MDL - Method Detection Limit; %R - Percent Recovery; RL - Reporting Limit; RPD - Relative Percent Difference; RSD - Relative Standard Deviation ;Corr - Correlation Coefficient.

ITEM	YES	NO	N/A	COMMENTS
Initial calibration documentation included in lab package?	X			
1) Blank plus 4 standards (7196A) or blank plus 3 standards (7199)	X			
2) Correlation coefficient of =0.995 (7196A) or =0.999 (7199)	X			
3) Calibrate daily or each time instrument is set up.	X			
Calibration Check Standard (CCS) for 7196A and Quality Control Sample (QCS) for 7199 Included in Lab Package?	X			
1) %R criteria met? (90 - 110%)	X			
2) Correct frequency of one per every 10 samples	X			
3) CCS and QCS from independent source and at mid- level of calibration curve	X			
Calibration Blanks	X			
1) Analyzed prior to initial calibration standards and after each CCS/QCS?	X			
2) Absolute value should not exceed MDL.	X			
Method Blank, Field Blanks and/or Equipment Blanks Included in Lab Package?	X			
1) Method blank analyzed with each preparation batch?	X			
2) Absolute value should not exceed MDL.	X			
Eh and pH Data	X			
1) Eh and pH data was included and plotted for all samples?	X			
Soluble Matrix Spike Data Included in Lab Package?	X			2 Sets. JC27616-17, -17R and JC27616-30
1) Soluble Matrix %R criteria met? (75-125%R).		X		JC27616-17 below QC limits. Reanalysis met QC limits. No qualifications made.
2) Was the spike concentration 40 mg/Kg or twice the sample concentration?	X			Spiked at 49.8, 50.2 and 44.8 mg/kg.
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	X			
Insoluble Matrix Spike Data Included in Lab Package?	X			
1) Insoluble Matrix %R criteria met? (75-125%R).	X			
2) Was the spike concentration around 400 to 800 mg/Kg?		X		Spiked at 1410, 1070 and 964 mg/kg. No impact on data.
3) Was a sample spiked at the frequency of 1 per batch or 20	X			

samples?				
Post Digestion Spike	X			
1) Post Digestion Spike %R criteria met? (85-115%R).	X			
2) Was the spike concentration 40 mg/Kg or twice the sample concentration?	X			
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	X			
Sample Duplicate Data Included in Lab Package?	X			JC27616-17, -17R & JC27616-30
1) RPD criteria met? (RPD < 20%) if both results are $\geq 4x$ RL or control limit of \pm RL if both results are $< 4xRL$.	X			SR<4xRL, Abs Diff<RL
2) Was a sample duplicate analyzed at the frequency of 1 per batch or 20 samples?	X			
Was a Laboratory Control Sample (LCS) Included in Lab Package?	X			
1) %R criteria met? (80-120%R).	X			
2) Was an LCS analyzed at the frequency of 1/batch or 20 samples?	X			
Were any Field Duplicate samples submitted with this SDG?	X			JC27616-25 & -26, JC27616-30 & -31
1) RPD criteria met? (RPD < 20%) if both results are $\geq 4x$ RL or control limit of \pm RL if both results are $< 4xRL$.		X		JC27616-30& -31 did not meet QC criteria. See table.
Were all sample quantitation and reporting requirements met?	X			
1) Were all solid samples reported with percent solids > 50%?	X			
2) Were any samples analyzed or reported with dilutions?	X			JC26717-24 diluted 1:5.
Miscellaneous Items	X			
1) For soils by 7196A, was the pH within a range of 7.0-8.0?	X			
2) For soils by 7199, was the pH within a range of 9.0-9.5?			X	
3) For aqueous by 7196A, was the pH with a range of 1.5-2.5?	X			
4) For soils (3060A), was the digestion temperature 90-95C for at least 60 minutes?	X			
5) For 7199, was each sample injected twice and was the RPD ≤ 20 ?			X	

Matrix Spikes

Sample ID	Lab ID	Analyte	Matrix Spike	% Recovery	Lower Limit	Upper Limit	PDS%	PDS Limit %
NFS-PDI-CC13B-14.0-14.5	JC27616-17	CHROMIUM (HEXAVALENT)	Soluble	61.8	75	125	93.99	85-115
NFS-PDI-CC13B-14.0-14.5	JC27616-17	CHROMIUM (HEXAVALENT)	Insoluble	101.6	75	125		
NFS-PDI-CC13B-14.0-14.5	JC27616-17R	CHROMIUM (HEXAVALENT)	Soluble	87.0	75	125	92	85-115
NFS-PDI-CC13B-14.0-14.5	JC27616-17R	CHROMIUM (HEXAVALENT)	Insoluble	100.7	75	125		
NFS-PDI-CC15B-14.0-14.5	JC27616-30	CHROMIUM (HEXAVALENT)	Soluble	98.0	75	125	95.01	85-115
NFS-PDI-CC15B-14.0-14.5	JC27616-30	CHROMIUM (HEXAVALENT)	Insoluble	91.6	75	125		

Lab Duplicates

Sample ID	Lab ID	Analyte	Sample Result	Qual	Duplicate Result	Qual	QL	Units	RPD	Action
NFS-PDI-CC15B-14.0-14.5	JC27616-30	CHROMIUM (HEXAVALENT)	0.60		0.44	U	0.46	mg/kg	30.8	SR<4xRL, Abs Diff<RL, Accept
NFS-PDI-CC13B-14.0-14.5	JC27616-17	CHROMIUM (HEXAVALENT)	3.8		3.4		0.50	mg/kg	11.1	OK
NFS-PDI-CC13B-14.0-14.5	JC27616-17R	CHROMIUM (HEXAVALENT)	4.3		4.4		0.50	mg/kg	2.3	OK

Field Duplicates

Sample ID	Duplicate ID	Lab ID	Analyte	Sample Result	Qual	Duplicate Result	Qual	QL	Units	RPD	Action
NFS-PDI-CC15B-14.0-14.5	NFS-PDI-CC15B-14.0-14.5X	JC27616-30/31	CHROMIUM (HEXAVALENT)	0.60		1.2		0.46	mg/kg	66.7	SR<4xRL, Abs Diff >RL, Estimate (J/UJ)
NFS-PDI-CC13B-14.0-14.5	NFS-PDI-CC13B-14.0-14.5X	JC27616-25/26	CHROMIUM (HEXAVALENT)	27.4		26.2		0.48	mg/kg	4.5	OK

Percent Solids

Sample ID	Percent Solids (%)	Status
NFS-PDI-AA13B-0.5-1.0	86.4	ok @50%
NFS-PDI-AA13B-10.0-10.5	83.1	ok @50%
NFS-PDI-AA13B-12.0-12.5	73.1	ok @50%
NFS-PDI-AA13B-14.0-14.5	80.5	ok @50%
NFS-PDI-AA13B-16.0-16.5	86	ok @50%
NFS-PDI-AA13B-18.0-18.5	86.2	ok @50%
NFS-PDI-AA13B-2.0-2.5	83.7	ok @50%
NFS-PDI-AA13B-20.0-20.5	87.3	ok @50%
NFS-PDI-AA13B-4.0-4.5	84.9	ok @50%
NFS-PDI-AA13B-5.5-6.0	69.4	ok @50%
NFS-PDI-AA13B-6.0-6.5	74.9	ok @50%
NFS-PDI-AA13B-8.0-8.5	76.7	ok @50%
NFS-PDI-CC13B-0.1-0.6	95	ok @50%
NFS-PDI-CC13B-10.0-10.5	87.4	ok @50%
NFS-PDI-CC13B-12.0-12.5	81.1	ok @50%
NFS-PDI-CC13B-14.0-14.5	80.6	ok @50%
NFS-PDI-CC13B-16.0-16.5	84.1	ok @50%
NFS-PDI-CC13B-18.0-18.5	87.2	ok @50%
NFS-PDI-CC13B-2.0-2.5	75	ok @50%
NFS-PDI-CC13B-20.0-20.5	89.9	ok @50%
NFS-PDI-CC13B-4.0-4.5	78.8	ok @50%
NFS-PDI-CC13B-6.0-6.5	78.9	ok @50%
NFS-PDI-CC13B-7.5-8.0	79.1	ok @50%
NFS-PDI-CC13B-8.0-8.5	82.9	ok @50%

Sample ID	Percent Solids (%)	Status
NFS-PDI-CC13B-8.0-8.5X	84.9	ok @50%
NFS-PDI-CC15B-0.2-0.7	84.2	ok @50%
NFS-PDI-CC15B-10.0-10.5	74.9	ok @50%
NFS-PDI-CC15B-12.0-12.5	83.8	ok @50%
NFS-PDI-CC15B-14.0-14.5	86.2	ok @50%
NFS-PDI-CC15B-14.0-14.5X	86	ok @50%
NFS-PDI-CC15B-16.0-16.5	84.9	ok @50%
NFS-PDI-CC15B-18.0-18.5	88.8	ok @50%
NFS-PDI-CC15B-2.0-2.5	85.1	ok @50%
NFS-PDI-CC15B-20.0-20.5	87.4	ok @50%
NFS-PDI-CC15B-4.0-4.5	84.6	ok @50%
NFS-PDI-CC15B-6.0-6.5	74.3	ok @50%

SDG#: JC27616/ Method 7196

Batch: GN52316

Cr+6 ICAL 9/21/16

Soil

(p. 108 of data pkg)

x - concentration	y - response
0	0
0.01	0.009
0.05	0.041
0.1	0.081
0.3	0.252
0.5	0.412
0.8	0.641
1	0.835

(p. 108 of data pkg)

AECOM Calculated Offset	-0.00003	OK	Reported Offset	-0.00003
AECOM Slope	0.8229	OK	Reported Slope	0.8229
AECOM Calculated r	0.99966	OK	Reported r	0.99966

LCS calculation

GP226-B1

P. 84,108

Background Absorbance	0
Total absorbance	0.722
Total absorbance - background	0.722
Instrument Concentration	0.877
Sample weight (mg/kg)	0.0025
Final Volume (L)	0.1
Dilution Factor	1

AECOM Calculated LCS Result (mg/Kg)	35.1	OK	Reported Result (mg/Kg)	35.1
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%R = Found/True*100

GP226-B1

P. 84,108

True Value (mg/kg)	40
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AECOM Calculated %R	87.7	OK, rounding	Reported %R	87.8
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MS calculation

GP226-S2

P. 86,89,108

JC27616-17

Background reading	0
Total absorbance	0.465
Total absorbance - background	0.465
Instrument Concentration	0.5651
Sample weight (mg/kg)	0.00243
Final Volume (L)	0.1
Percent solids	0.806
Dilution Factor	50

AECOM Calculated MS Result (mg/Kg)	1443	OK, rounding	Reported Result (mg/Kg)	1440
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%R = Found/True*100

GP226-S2

P. 86,89,108

JC27616-17

True Value (mg/kg)	1410
Native concentration (mg/Kg)	3.8

AECOM %R	102	OK	Reported %R	102
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Percent Solids

JC27616-17

P. 89

NFS-PDI-CC13B-14.0-14.5

Empty dish weight=	23.45
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Wet weight= 31.35

Dry weight= 29.82

AECOM %solids =	80.6	OK	Reported %solids=	80.6
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Reporting Limit	JC27616-17	P. 33,89,108	NFS-PDI-CC13B-14.0-14.5
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Low Standard 0.01

Initial weight (mg/kg) 0.00258

Final volume (L) 0.1

Percent solids 0.806

Dilution Factor 1

Reporting Limit	0.48	OK, rounding	Reported RL (mg/Kg)=	0.50
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Sample Calculations	JC27616-17	P. 33,89,108	NFS-PDI-CC13B-14.0-14.5
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Background reading 0.002

Total absorbance 0.067

Total absorbance - background 0.065

Instrument Response 0.079

Sample weight (mg/kg) 0.00258

Final Volume (L) 0.1

Percent solids 0.806

Dilution Factor 1

AECOM Calculated Result (mg/Kg)	3.8	OK	Reported Result (mg/Kg)	3.8
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Associated w/ samples JC27616-2 through JC27616-21

SDG#: JC27616/ Method 7196

Batch: GN52325

Cr+6 ICAL 9/21/16

Soil

(p. 120 of data pkg)

x - concentration	y - response
0	0
0.01	0.009
0.05	0.041
0.1	0.081
0.3	0.252
0.5	0.412
0.8	0.641
1	0.835

(p. 120 of data pkg)

AECOM Calculated Offset	-0.00003	OK	Reported Offset	-0.00003
AECOM Slope	0.8229	OK	Reported Slope	0.8229
AECOM Calculated r	0.99966	OK	Reported r	0.99966

LCS calculation

GP228-B1

P. 84,120

Background Absorbance	0
Total absorbance	0.723
Total absorbance - background	0.723
Instrument Concentration	0.879
Sample weight (mg/kg)	0.0025
Final Volume (L)	0.1
Dilution Factor	1

AECOM Calculated LCS Result (mg/Kg)	35.1	OK	Reported Result (mg/Kg)	35.1
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%R = Found/True*100

GP228-B1

P. 84,120

True Value (mg/kg)	40
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AECOM Calculated %R	87.9	OK, rounding	Reported %R	87.8
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MS calculation

GP228-S2

P. 86,91,120

JC27616-30

Background reading	0
Total absorbance	0.301
Total absorbance - background	0.301
Instrument Concentration	0.3658
Sample weight (mg/kg)	0.0024
Final Volume (L)	0.1
Percent solids	0.862
Dilution Factor	50

AECOM Calculated MS Result (mg/Kg)	884	OK	Reported Result (mg/Kg)	884
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%R = Found/True*100

GP228-S2

P. 86,91,120

JC27616-30

True Value (mg/kg)	964
Native concentration (mg/Kg)	0.6

AECOM %R	91.7	OK, rounding	Reported %R	91.6
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Percent Solids

JC27616-30

P. 91

NFS-PDI-CC15B-14.0-14.5

Empty dish weight=	28.5
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Wet weight= 36.83

Dry weight= 35.68

AECOM %solids =	86.2	OK	Reported %solids=	86.2
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Reporting Limit	JC27616-30	P. 46,91,120	NFS-PDI-CC15B-14.0-14.5
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Low Standard 0.01

Initial weight (mg/kg) 0.00259

Final volume (L) 0.1

Percent solids 0.862

Dilution Factor 1

Reporting Limit	0.45	OK, rounding	Reported RL (mg/Kg)=	0.46
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Sample Calculations	JC27616-30	P. 46,91,120	NFS-PDI-CC15B-14.0-14.5
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Background reading 0.003

Total absorbance 0.014

Total absorbance - background 0.011

Instrument Response 0.013

Sample weight (mg/kg) 0.00259

Final Volume (L) 0.1

Percent solids 0.862

Dilution Factor 1

AECOM Calculated Result (mg/Kg)	0.60	OK	Reported Result (mg/Kg)	0.60
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Associated w/ samples JC27616-22 through JC27616-40

SDG#: JC27616R/ Method 7196

Batch: GN52955

Cr+6 ICAL 10/5/16

Soil

(p. 96 of data pkg)

x - concentration	y - response
0	0
0.01	0.009
0.05	0.043
0.1	0.086
0.3	0.241
0.5	0.42
0.8	0.655
1	0.845

(p. 96 of data pkg)

AECOM Calculated Offset	-0.0008	OK	Reported Offset	-0.0008
AECOM Slope	0.8352	OK	Reported Slope	0.8352
AECOM Calculated r	0.99975	OK	Reported r	0.99975

LCS calculation

GP469-B1

P. 51,96

Background Absorbance	0
Total absorbance	0.711
Total absorbance - background	0.711
Instrument Concentration	0.852
Sample weight (mg/kg)	0.0025
Final Volume (L)	0.1
Dilution Factor	1

AECOM Calculated LCS Result (mg/Kg)	34.1	OK	Reported Result (mg/Kg)	34.1
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%R = Found/True*100

GP469-B1

P. 51,96

True Value (mg/kg)	40
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AECOM Calculated %R	85.2	OK, rounding	Reported %R	85.3
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MS calculation

GP469-S2

P. 53,61,96

JC27616-17R

Background reading	0
Total absorbance	0.353
Total absorbance - background	0.353
Instrument Concentration	0.4236
Sample weight (mg/kg)	0.00243
Final Volume (L)	0.1
Percent solids	0.806
Dilution Factor	50

AECOM Calculated MS Result (mg/Kg)	1081	OK, rounding	Reported Result (mg/Kg)	1080
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%R = Found/True*100

GP469-S2

P. 53,61,96

JC27616-17R

True Value (mg/kg)	1070
Native concentration (mg/Kg)	4.3

AECOM%R	100.7	OK	Reported %R	100.7
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Percent Solids	JC27616-17R	P. 61	NFS-PDI-CC13B-14.0-14.5
Empty dish weight=	23.45		
Wet weight=	31.35		
Dry weight=	29.82		
AECOM %solids =	80.6	OK	Reported %solids= 80.6

Reporting Limit	JC27616-17R	P. 26,61,96	NFS-PDI-CC13B-14.0-14.5
Low Standard	0.01		
Initial weight (mg/kg)	0.00257		
Final volume (L)	0.1		
Percent solids	0.806		
Dilution Factor	1		
Reporting Limit	0.48	OK, rounding	Reported RL (mg/Kg)= 0.50

Sample Calculations	JC27616-17R	P. 26,61,96	NFS-PDI-CC13B-14.0-14.5
Background reading	0		
Total absorbance	0.074		
Total absorbance - background	0.074		
Instrument Response	0.090		
Sample weight (mg/kg)	0.00257		
Final Volume (L)	0.1		
Percent solids	0.806		
Dilution Factor	1		
AECOM Calculated Result (mg/Kg)	4.3	OK	Reported Result (mg/Kg) 4.3

Associated w/ samples JC27616-2R through JC27616-21R

Data Validation Report

Project:	PPG - North Forest Street PDI
Laboratory:	SGS/Accutest, Dayton, NJ
Laboratory Job No.:	JC27804, JC27804R and JC27804T
Analysis/Method:	Hexavalent Chromium SW846 3060A/7196A
Validation Level:	Full
Site Location/Address:	70 Carteret Avenue
AECOM Project No:	60314351.GA.DE.PDI.NFS
Prepared by:	Charlene Livingston Flint /AECOM
Completed on:	10/17/2016
Reviewed by:	Mary Kozik /AECOM
File Name:	JC27804_R_T_2016-10-17_DVReport-F

Introduction

The data were reviewed in accordance with the FSP-QAPP and the following NJDEP validation Standard Operating Procedure (SOP):

- NJDEP Office of Data Quality SOP 5.A.10, Rev 3 (September 2009), SOP for Analytical Data Validation of Hexavalent Chromium - for USEPA SW-846 Method 3060A, USEPA SW-846 Method 7196A and USEPA SW-846 Method 7199;

The results of quality control data analyzed with site samples were used to assess the overall reliability of the data. The following qualifiers were used to identify data quality issues:

- U: Indicates the analyte was not detected in the sample above the sample reporting limit.
- J: Indicates the result was an estimated value; the associated numerical value was an approximate concentration of the analyte in the sample.
- UJ: Indicates the analyte was not detected above the reporting limit and the reporting limit was approximate.
- UB: The analyte concentration is less than or equal to three (3) times the concentration in the associated method/prep blank. The presence of the analyte in the sample is negated (UB) due to laboratory contamination.
- JB: The analyte concentration is greater than three (3) times, but less than or equal to ten (10) times the concentration in the associated method/prep blank. The presence of that analyte in the sample is considered "real". The concentration is quantitatively qualified (JB) due to method blank contamination.
- R: The sample result was rejected due to serious deficiencies; the presence or absence of the analyte could not be confirmed.

RA: The sample result was rejected but is still considered usable.

Sample Information

The samples listed below were collected by AECOM on September 16, 2016 as part of the PPG - North Forest Street PDI sampling at 70 Carteret Avenue, Jersey City, New Jersey. Only the samples and parameters listed below were validated.

Field ID	Laboratory ID	Matrix	Fraction
NFS-PDI-BB13B-0.7-1.2	JC27804-2	Soil	Hexavalent Chromium
NFS-PDI-BB13B-0.7-1.2	JC27804-2R	Soil	Hexavalent Chromium
NFS-PDI-BB13B-2.7-3.2	JC27804-3	Soil	Hexavalent Chromium
NFS-PDI-BB13B-2.7-3.2	JC27804-3R	Soil	Hexavalent Chromium
NFS-PDI-BB13B-4.7-5.2	JC27804-4	Soil	Hexavalent Chromium
NFS-PDI-BB13B-4.7-5.2	JC27804-4R	Soil	Hexavalent Chromium
NFS-PDI-BB13B-4.7-5.2X (Field Duplicate of NFS-PDI-BB13B-4.7-5.2)	JC27804-5	Soil	Hexavalent Chromium
NFS-PDI-BB13B-4.7-5.2X (Field Duplicate of NFS-PDI-BB13B-4.7-5.2)	JC27804-5R	Soil	Hexavalent Chromium
NFS-PDI-BB13B-6.7-7.2	JC27804-6	Soil	Hexavalent Chromium
NFS-PDI-BB13B-6.7-7.2	JC27804-6R	Soil	Hexavalent Chromium
NFS-PDI-BB13B-8.7-9.2	JC27804-7	Soil	Hexavalent Chromium
NFS-PDI-BB13B-8.7-9.2	JC27804-7R	Soil	Hexavalent Chromium
NFS-PDI-BB13B-9.0-9.5	JC27804-8	Soil	Hexavalent Chromium
NFS-PDI-BB13B-9.0-9.5	JC27804-8R	Soil	Hexavalent Chromium
NFS-PDI-BB13B-9.5-10.0	JC27804-9	Soil	Hexavalent Chromium
NFS-PDI-BB13B-9.5-10.0	JC27804-9R	Soil	Hexavalent Chromium
NFS-PDI-BB14B-0.5-1.0	JC27804-10	Soil	Hexavalent Chromium
NFS-PDI-BB14B-0.5-1.0	JC27804-10R	Soil	Hexavalent Chromium
NFS-PDI-BB14B-2.5-3.0	JC27804-11	Soil	Hexavalent Chromium
NFS-PDI-BB14B-2.5-3.0	JC27804-11R	Soil	Hexavalent Chromium
NFS-PDI-BB14B-4.5-5.0	JC27804-12	Soil	Hexavalent Chromium
NFS-PDI-BB14B-4.5-5.0	JC27804-12R	Soil	Hexavalent Chromium
NFS-PDI-BB14B-4.5-5.0X (Field Duplicate of NFS-PDI-BB14B-4.5-5.0)	JC27804-14	Soil	Hexavalent Chromium
NFS-PDI-BB14B-4.5-5.0X (Field Duplicate of NFS-PDI-BB14B-4.5-5.0)	JC27804-14T	Soil	Hexavalent Chromium
NFS-PDI-BB14B-6.5-7.0	JC27804-13	Soil	Hexavalent Chromium
NFS-PDI-BB14B-6.5-7.0	JC27804-13R	Soil	Hexavalent Chromium
NFS-PDI-BB14B-8.0-8.5	JC27804-15	Soil	Hexavalent Chromium
NFS-PDI-BB14B-8.0-8.5	JC27804-15T	Soil	Hexavalent Chromium
NFS-PDI-BB14B-8.5-9.0	JC27804-16	Soil	Hexavalent Chromium
NFS-PDI-BB14B-8.5-9.0	JC27804-16T	Soil	Hexavalent Chromium
NFS-PDI-CC14B-0.5-1.0	JC27804-17	Soil	Hexavalent Chromium

Field ID	Laboratory ID	Matrix	Fraction
NFS-PDI-CC14B-0.5-1.0	JC27804-17T	Soil	Hexavalent Chromium
NFS-PDI-CC14B-10.5-11.0	JC27804-18	Soil	Hexavalent Chromium
NFS-PDI-CC14B-10.5-11.0	JC27804-18T	Soil	Hexavalent Chromium
NFS-PDI-CC14B-2.5-3.0	JC27804-19	Soil	Hexavalent Chromium
NFS-PDI-CC14B-2.5-3.0	JC27804-19T	Soil	Hexavalent Chromium
NFS-PDI-CC14B-4.5-5.0	JC27804-20	Soil	Hexavalent Chromium
NFS-PDI-CC14B-4.5-5.0	JC27804-20T	Soil	Hexavalent Chromium
NFS-PDI-CC14B-6.5-7.0	JC27804-21	Soil	Hexavalent Chromium
NFS-PDI-CC14B-6.5-7.0	JC27804-21T	Soil	Hexavalent Chromium
NFS-PDI-CC14B-7.5-8.0	JC27804-22	Soil	Hexavalent Chromium
NFS-PDI-CC14B-7.5-8.0	JC27804-22T	Soil	Hexavalent Chromium
NFS-PDI-CC14B-8.0-8.5	JC27804-23	Soil	Hexavalent Chromium
NFS-PDI-CC14B-8.0-8.5	JC27804-23T	Soil	Hexavalent Chromium
NFS-PDI-CC14B-8.5-9.0	JC27804-24	Soil	Hexavalent Chromium
NFS-PDI-CC14B-8.5-9.0	JC27804-24T	Soil	Hexavalent Chromium
NFS-PDI-FB20160916 (Equipment Blank)	JC27804-1	Aqueous	Hexavalent Chromium

The samples were collected following the procedures detailed in the Work Order for Garfield Avenue Remedial Action (GARA) at 70 Carteret Avenue and the Field Sampling Plan/Quality Assurance Project Plan for Non-Residential and Residential Chromium Sites Hudson County, New Jersey (December 2011).

General Comments

The data package was complete. Quality control (QC) issues identified during validation are discussed below. Refer to the Target Analyte Summary Hit(s) in Attachment A for a listing of all detected results, qualified results, and associated qualifications, where applicable. The nonconformances for each section discussed below are presented in Attachment B.

MS Results

Two matrix spike (MS) samples, NFS-PDI-BB14B-0.5-1.0 (JC27804-10) and NFS-PDI-BB14B-4.5-5.0 (JC27804-14), were analyzed with the samples in this SDG and were used for supporting data quality recommendations. MS samples are associated with field samples using matrix similarities as the primary criteria, then by analytical preparation batch when no matrix match is possible. The following table summarizes each of the MS samples and field samples associated with each, differentiating between those associated by matrix, and those associated by batch.

Spiked Sample	Samples Associated by Matrix	Samples Associated by Batch
NFS-PDI-BB14B-0.5-1.0 (JC27804-10)	NFS-PDI-BB13B-0.7-1.2 (JC27804-2) NFS-PDI-BB13B-2.7-3.2 (JC27804-3) NFS-PDI-BB14B-2.5-3.0 (JC27804-11)	NFS-PDI-BB13B-9.5-10.0 (JC27804-9)

Spiked Sample	Samples Associated by Matrix	Samples Associated by Batch
NFS-PDI-BB14B-4.5-5.0 (JC27804-14)	NFS-PDI-BB13B-4.7-5.2 (JC27804-4) NFS-PDI-BB13B-4.7-5.2X (JC27804-5) NFS-PDI-BB13B-6.7-7.2 (JC27804-6) NFS-PDI-BB13B-8.7-9.2 (JC27804-7) NFS-PDI-BB13B-9.0-9.5 (JC27804-8) NFS-PDI-BB14B-4.5-5.0 (JC27804-12) NFS-PDI-BB14B-6.5-7.0 (JC27804-13) NFS-PDI-BB14B-8.0-8.5 (JC27804-15) NFS-PDI-CC14B-2.5-3.0 (JC27804-19) NFS-PDI-CC14B-4.5-5.0 (JC27804-20)	NFS-PDI-BB14B-8.5-9.0 (JC27804-16) NFS-PDI-CC14B-0.5-1.0 (JC27804-17) NFS-PDI-CC14B-10.5-11.0 (JC27804-18) NFS-PDI-CC14B-6.5-7.0 (JC27804-21) NFS-PDI-CC14B-7.5-8.0 (JC27804-22) NFS-PDI-CC14B-8.0-8.5 (JC27804-23) NFS-PDI-CC14B-8.5-9.0 (JC27804-24)

MS sample NFS-PDI-BB14B-0.5-1.0 (JC27804-10)

Sample NFS-PDI-BB14B-0.5-1.0, associated with samples as noted above, was selected for the soil matrix spike analysis and used for supporting data quality recommendations. The soluble and insoluble MS recoveries from the initial batch were -0.2% and 85.2%, respectively. The soluble MS recovery did not meet quality control (QC) criteria of 75-125%R. The post digestion spike (PDS) recovery was 88.31%, which met the PDS criteria of 85-115%.

Based on the soluble MS recovery, less than 75%R, the MS and associated samples were reanalyzed using Method 7196. The soluble and insoluble matrix spike recoveries from the re-analysis were 81.2% and 102.0%, respectively; which met the QC criteria of 75-125%R. The post spike result for the re-analysis batch was recovered at 96.59%, which met the PDS criteria of 85-115%. No data qualification was required on the basis of spike recoveries for results reported from the reanalysis; results reported from the initial analysis were qualified as estimated (J/UJ) based on the low soluble spike recovery.

MS sample NFS-PDI-BB14B-4.5-5.0 (JC27804-14)

Sample NFS-PDI-BB14B-4.5-5.0, associated with samples as noted above, was selected for the soil matrix spike analysis and used for supporting data quality recommendations. The soluble and insoluble MS recoveries from the initial batch were 1.8% and 61.1%, respectively. The soluble and insoluble MS recoveries did not meet QC criteria of 75-125%R. The PDS recovery was 53% and after pH adjustment was 62%, which did not meet the PDS criteria of 85-115%.

Based on low MS recoveries, less than 75%R, the MS and associated samples were reanalyzed using Method 7196. The soluble and insoluble matrix spike recoveries from the re-analysis were 0.8% and 86.3%, respectively. The soluble MS recovery did not meet the QC criteria of 75-125%R. The post spike result for the re-analysis batch was recovered at 69.28% and after pH adjustment was 64.0%, which did not meet the PDS criteria of 85-115%.

Since the soluble and/or insoluble MS recoveries were outside the acceptable QC limit of 75-125%, additional parameters were analyzed to determine if possible matrix interferences could be the cause for the poor matrix spike recoveries. All the soil samples were tested for pH and oxidation reduction potential (ORP) and plotted on an Eh/pH phase diagram chart. From this chart, the source sample for the matrix spike analysis was plotted below the phase change line, indicating reducing potential within the sample matrix, incapable of supporting hexavalent chromium. Analyses for ferrous iron, sulfide screen, and total organic carbon (TOC) were performed on the MS source sample to confirm the oxidizing/reducing potential within the sample matrix. The sulfide screen was reported as nondetect, indicating no reducing agents within the sample matrix; however, the ferrous iron (1.3 %) and the TOC results (10,500 mg/Kg) were positive, indicating potential reducing agents within the sample matrix.

Since the MS recoveries from both the initial and reanalysis did not meet the MS QC requirements, but at least one MS recovery was greater than 50%, the highest detected hexavalent chromium result or the nondetect hexavalent chromium result with the lowest reporting limit (RL) was reported for each soil sample. The reported hexavalent chromium results in the associated soil samples were qualified as estimated (J/UJ) due to the poor MS and PDS recoveries.

Laboratory Duplicate Precision

There were two sets of laboratory duplicates, NFS-PDI-BB14B-0.5-1.0 (JC27804-10) and NFS-PDI-BB14B-4.5-5.0 (JC27804-14) that were selected by the laboratory to demonstrate laboratory precision capabilities.

The relative percent difference for hexavalent chromium in sample NFS-PDI-BB14B-0.5-1.0, associated with samples JC27804-2 through JC27804-13, exceeded the QC acceptance RPD in the reanalysis; therefore, the hexavalent chromium results in the associated soil samples reported from the reanalysis were qualified as estimated (J).

Both the sample and duplicate results were less than 4 times the RL and the absolute difference was less than the RL for sample NFS-PDI-BB14B-4.5-5.0, associated with samples JC27804-13 through JC27804-24. No qualifications were made.

Field Duplicate Results

Two field duplicate pairs, NFS-PDI-BB13B-4.7-5.2 (JC27804-4) & NFS-PDI-BB13B-4.7-5.2X (JC27804-5) and NFS-PDI-BB14B-4.5-5.0 (JC27804-12) & NFS-PDI-BB14B-4.5-5.0X (JC27804-14), are associated with the samples in this SDG and were used for supporting data quality recommendations. Field duplicate samples are associated with field samples using matrix similarities as the primary criteria, then by analytical preparation batch when no matrix match is possible. The following table summarizes each of the field duplicate samples and field samples associated with each, differentiating between those associated by matrix, and those associated by batch.

Field Duplicate Sample	Samples Associated for Matrix	Samples Associated by Batch
NFS-PDI-BB13B-4.7-5.2/NFS-PDI-BB13B-4.7-5.2X (JC27804-4/5)	NFS-PDI-BB13B-6.7-7.2 (JC27804-6) NFS-PDI-BB13B-8.7-9.2 (JC27804-7) NFS-PDI-BB13B-9.0-9.5 (JC27804-8) NFS-PDI-CC14B-6.5-7.0 (JC27804-21) NFS-PDI-CC14B-7.5-8.0 (JC27804-22)	NFS-PDI-BB13B-0.7-1.2 (JC27804-2) NFS-PDI-BB13B-2.7-3.2 (JC27804-3) NFS-PDI-BB13B-9.5-10.0 (JC27804-9) NFS-PDI-BB14B-0.5-1.0 (JC27804-10) NFS-PDI-BB14B-2.5-3.0 (JC27804-11)
NFS-PDI-BB14B-4.5-5.0/ NFS-PDI-BB14B-4.5-5.0X (JC27804-12/14)	NFS-PDI-BB14B-6.5-7.0 (JC27804-13) NFS-PDI-BB14B-8.0-8.5 (JC27804-15) NFS-PDI-CC14B-2.5-3.0 (JC27804-19) NFS-PDI-CC14B-4.5-5.0 (JC27804-20)	NFS-PDI-BB14B-8.5-9.0 (JC27804-16) NFS-PDI-CC14B-0.5-1.0 (JC27804-17) NFS-PDI-CC14B-10.5-11.0 (JC27804-18) NFS-PDI-CC14B-8.0-8.5 (JC27804-23) NFS-PDI-CC14B-8.5-9.0 (JC27804-24)

The relative percent difference for the reported hexavalent chromium field duplicate results in both field duplicate pairs, NFS-PDI-BB13B-4.7-5.2 & NFS-PDI-BB13B-4.7-5.2X and NFS-PDI-BB14B-4.5-5.0 & NFS-PDI-BB14B-4.5-5.0X, associated with samples as noted above, exceeded the QC acceptance RPD; therefore, the reported hexavalent chromium results in the associated soil samples were qualified as estimated (J).

Sample Results

Reported results (flagged B by the laboratory) that were less than the reporting limit (RL), but greater than or equal to the method detection limit (MDL) are approximate values and have been qualified as estimated (J).

Sample NFS-PDI-BB13B-4.7-5.2 (JC27804-4) had results that significantly differed between the initial analysis and reanalysis, such that one result exceeded the project action limit of 20 mg/kg. The highest detected hexavalent chromium result between the initial analysis and reanalysis was reported for each sample in this SDG.

Data Quality and Usability

In general, these data appear to be valid and may be used for decision-making purposes. No data were rejected. Qualified results, if applicable, are presented in Attachments A and B.

The hexavalent chromium soil results in this SDG are usable as estimated values with the potential for low bias due to low soluble MS and or PDS recovery, and since the MS sample matrix appears to be reducing based on the Eh-pH plot and the presence of TOC and ferrous iron.

Sample results qualified due to poor laboratory duplicate precision and or field duplicate precision, are usable as estimated values with an unknown directional bias.

Sample NFS-PDI-BB13B-4.7-5.2 (JC27804-4) had results that significantly differed between the initial analysis and reanalysis, such that one result exceeded the project action limit of 20 mg/kg. The highest detected hexavalent chromium result between the initial analysis and reanalysis was reported for each sample in this SDG.

Sample results reported between the MDL and RL are usable as estimated values with an unknown directional bias.

ATTACHMENTS

Attachment A: Target Analyte Summary Hitlist(s)

Attachment B: Data Validation Report Form

Attachment A

Target Analyte Summary Hitlist(s)

Soil Target Analyte Summary Hit List (Hexavalent Chromium)

Site Name PPG - North Forest Street PDI
Sampling Date September 16, 2016
Lab Name/ID SGS/Accutest, Dayton, NJ
SDG No JC27804, JC27804R and JC27804T
Sample Matrix Soil
Trip Blank ID NA
Field Blank ID NFS-PDI-FB20160916

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
NFS-PDI-BB13B-0.7-1.2	JC27804-2	CHROMIUM (HEXAVALENT)	U	0.79	0.79	0.46	Qualify	1,4
NFS-PDI-BB13B-2.7-3.2	JC27804-3	CHROMIUM (HEXAVALENT)	U	0.33B	0.33	0.45	Qualify	1,4,5
NFS-PDI-BB13B-4.7-5.2	JC27804-4	CHROMIUM (HEXAVALENT)	U	34.9	34.9	0.52	Qualify	1,2,4
NFS-PDI-BB13B-4.7-5.2X	JC27804-5	CHROMIUM (HEXAVALENT)	U	1.9	1.9	0.51	Qualify	1,2,4
NFS-PDI-BB13B-6.7-7.2	JC27804-6	CHROMIUM (HEXAVALENT)	U	1.3	1.3	0.50	Qualify	1,2,4
NFS-PDI-BB13B-8.7-9.2	JC27804-7	CHROMIUM (HEXAVALENT)	U	0.57	0.57	0.50	Qualify	1,2,4
NFS-PDI-BB13B-9.0-9.5	JC27804-8	CHROMIUM (HEXAVALENT)	U	0.65	0.65	0.52	Qualify	1,2,4
NFS-PDI-BB13B-9.5-10.0	JC27804-9	CHROMIUM (HEXAVALENT)	U	42.2	42.2	0.50	Qualify	1,4
NFS-PDI-BB14B-0.5-1.0	JC27804-10R	CHROMIUM (HEXAVALENT)	U	1.3	1.3	0.45	Qualify	3,4
NFS-PDI-BB14B-2.5-3.0	JC27804-11	CHROMIUM (HEXAVALENT)	U	0.72	0.72	0.44	Qualify	1,4
NFS-PDI-BB14B-4.5-5.0	JC27804-12	CHROMIUM (HEXAVALENT)	U	1.4	1.4	0.51	Qualify	1,2,4
NFS-PDI-BB14B-4.5-5.0X	JC27804-14	CHROMIUM (HEXAVALENT)	U	0.40B	0.40	0.51	Qualify	1,2,4,5
NFS-PDI-BB14B-6.5-7.0	JC27804-13R	CHROMIUM (HEXAVALENT)	U	5.1	5.1	0.52	Qualify	1,2,3,4
NFS-PDI-BB14B-8.0-8.5	JC27804-15	CHROMIUM (HEXAVALENT)	U	0.66	0.66	0.51	Qualify	1,2,4
NFS-PDI-BB14B-8.5-9.0	JC27804-16T	CHROMIUM (HEXAVALENT)	U	0.78	0.78	0.47	Qualify	1,2,4
NFS-PDI-CC14B-0.5-1.0	JC27804-17	CHROMIUM (HEXAVALENT)	U	1.4	1.4	0.42	Qualify	1,2,4
NFS-PDI-CC14B-10.5-11.0	JC27804-18	CHROMIUM (HEXAVALENT)	U	2.5	2.5	0.47	Qualify	1,2,4
NFS-PDI-CC14B-2.5-3.0	JC27804-19	CHROMIUM (HEXAVALENT)	U	U	U	0.49	Qualify	1,2,4

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
NFS-PDI-CC14B-4.5-5.0	JC27804-20	CHROMIUM (HEXAVALENT)	U	U	U	0.49	Qualify	1,2,4
NFS-PDI-CC14B-6.5-7.0	JC27804-21T	CHROMIUM (HEXAVALENT)	U	0.43B	0.43	0.52	Qualify	1,2,4,5
NFS-PDI-CC14B-7.5-8.0	JC27804-22	CHROMIUM (HEXAVALENT)	U	0.82	0.82	0.47	Qualify	1,2,4
NFS-PDI-CC14B-8.0-8.5	JC27804-23T	CHROMIUM (HEXAVALENT)	U	0.32B	0.32	0.46	Qualify	1,2,4,5
NFS-PDI-CC14B-8.5-9.0	JC27804-24	CHROMIUM (HEXAVALENT)	U	0.37B	0.37	0.48	Qualify	1,2,4,5

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

NJDEP Laboratory Footnote

1. The reported value was qualified because the soluble and/or insoluble matrix recoveries were less than 75%, but greater than 50%.
2. The reported value was qualified because the PDS recovery was less than 85 percent.
3. In the Duplicate Sample Analysis, Hexavalent Chromium fell outside the control limits of + 20 percent for sample results > 4xRL or + RL for sample results < 4xRL. Therefore, the result was qualified.
4. In the Field Duplicate Sample Analysis, Hexavalent Chromium fell outside the control limits of ≤20% for sample results > 4xRL or + RL for sample results < 4xRL. Therefore, the result was qualified.
5. The reported result was greater than the MDL but less than the RL and therefore was estimated.

Attachment B

Data Validation Report Form

Client Name: PPG Industries		Project Number: 60314351.GA.DE.PDI.NFS			
Site Location: PPG - North Forest Street PDI, Jersey City, NJ		Project Manager: Aimee Ruiter			
Laboratory: SGS/Accutest, Dayton, NJ		Type of Validation: Full			
Laboratory Job No: JC27804, JC27804R and JC27804T		Date Checked: 10/17/2016			
Validator: Charlene Livingston Flint		Peer: Mary Kozik			
ITEM	YES	NO	N/A	COMMENTS	
Sample results included?	X				
Reporting Limits met project requirements?	X				
Field I.D. included?	X				
Laboratory I.D. included?	X				
Did data package sample IDs match sample IDs on COC?	X				
Did electronic data deliverable (EDD) sample IDs match COC sample IDs?	X				
Did data package sample IDs match electronic data deliverable (EDD) sample IDs?	X				
Sample matrix included?	X				
Sample receipt temperature 2-6°C?	X			4.9° C	
Signed COCs included?	X				
Date of sample collection included?	X				
Date of sample digestion included?	X				
Holding time to digestion met criteria? (Soils -30 days from collection to digestion.)	X				
Date of analysis included?	X				
Holding time to analysis met criteria? (Soils -168 hours from digestion to analysis; Aqueous - 24 hours from collection to analysis.)	X				
Method reference included?	X				
Laboratory Case Narrative included?	X				
Definitions: MDL - Method Detection Limit; %R - Percent Recovery; RL - Reporting Limit; RPD - Relative Percent Difference; RSD - Relative Standard Deviation :Corr - Correlation Coefficient.					

ITEM	YES	NO	N/A	COMMENTS
Initial calibration documentation included in lab package?	X			
1) Blank plus 4 standards (7196A) or blank plus 3 standards (7199)	X			
2) Correlation coefficient of =0.995 (7196A) or =0.999 (7199)	X			
3) Calibrate daily or each time instrument is set up.	X			
Calibration Check Standard (CCS) for 7196A and Quality Control Sample (QCS) for 7199 Included in Lab Package?	X			
1) %R criteria met? (90 - 110%)	X			
2) Correct frequency of one per every 10 samples	X			
3) CCS and QCS from independent source and at mid- level of calibration curve	X			
Calibration Blanks	X			
1) Analyzed prior to initial calibration standards and after each CCS/QCS?	X			
2) Absolute value should not exceed MDL.	X			
Method Blank, Field Blanks and/or Equipment Blanks Included in Lab Package?	X			
1) Method blank analyzed with each preparation batch?	X			
2) Absolute value should not exceed MDL.	X			
Eh and pH Data	X			
1) Eh and pH data was included and plotted for all samples?	X			
Soluble Matrix Spike Data Included in Lab Package?	X			2 Sets. JC27804-10, -10R & JC27804-14, -14T
1) Soluble Matrix %R criteria met? (75-125%R).		X		See nonconformance tables.
2) Was the spike concentration 40 mg/Kg or twice the sample concentration?	X			Spiked at 45.4, 46.6, 50.2 and 51.8 mg/kg.
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	X			
Insoluble Matrix Spike Data Included in Lab Package?	X			
1) Insoluble Matrix %R criteria met? (75-125%R).		X		Initial analysis of JC27804-14 did not meet QC criteria. See table.
2) Was the spike concentration around 400 to 800 mg/Kg?		X		Spiked at 1430, 779, 1230 and 1260 mg/kg. No impact on data.
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	X			
Post Digestion Spike	X			

1) Post Digestion Spike %R criteria met? (85-115%R).		X		See nonconformance tables.
2) Was the spike concentration 40 mg/Kg or twice the sample concentration?	X			
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	X			
Sample Duplicate Data Included in Lab Package?	X			JC27804-10, -10R, -14, -14T
1) RPD criteria met? (RPD < 20%) if both results are $\geq 4x$ RL or control limit of \pm RL if both results are <4xRL.		X		See nonconformance table.
2) Was a sample duplicate analyzed at the frequency of 1 per batch or 20 samples?	X			
Was a Laboratory Control Sample (LCS) Included in Lab Package?	X			
1) %R criteria met? (80-120%R).	X			
2) Was an LCS analyzed at the frequency of 1/batch or 20 samples?	X			
Were any Field Duplicate samples submitted with this SDG?	X			2 Sets. JC27804-4 & -5, JC27804-12 & -14
1) RPD criteria met? (RPD < 20%) if both results are $\geq 4x$ RL or control limit of \pm RL if both results are <4xRL.		X		See nonconformance tables.
Were all sample quantitation and reporting requirements met?	X			
1) Were all solid samples reported with percent solids > 50%?	X			
2) Were any samples analyzed or reported with dilutions?		X		
Miscellaneous Items	X			
1) For soils by 7196A, was the pH within a range of 7.0-8.0?	X			
2) For soils by 7199, was the pH within a range of 9.0-9.5?			X	
3) For aqueous by 7196A, was the pH with a range of 1.5-2.5?	X			
4) For soils (3060A), was the digestion temperature 90-95C for at least 60 minutes?	X			
5) For 7199, was each sample injected twice and was the RPD ≤ 20 ?			X	

Matrix Spikes

Sample ID	Lab ID	Analyte	Matrix Spike	% Recovery	Lower Limit	Upper Limit	PDS%	PDS Limit %
NFS-PDI-BB14B-0.5-1.0	JC27804-10	CHROMIUM (HEXAVALENT)	Soluble	-0.2	75	125	88.31	85-115
NFS-PDI-BB14B-0.5-1.0	JC27804-10	CHROMIUM (HEXAVALENT)	Insoluble	85.2	75	125		
NFS-PDI-BB14B-0.5-1.0	JC27804-10R	CHROMIUM (HEXAVALENT)	Soluble	81.2	75	125	96.59	85-115
NFS-PDI-BB14B-0.5-1.0	JC27804-10R	CHROMIUM (HEXAVALENT)	Insoluble	102	75	125		
NFS-PDI-BB14B-4.5-5.0	JC27804-14	CHROMIUM (HEXAVALENT)	Soluble	1.8	75	125	53, pH adjusted 62	85-115
NFS-PDI-BB14B-4.5-5.0	JC27804-14	CHROMIUM (HEXAVALENT)	Insoluble	61.1	75	125		
NFS-PDI-BB14B-4.5-5.0	JC27804-14T	CHROMIUM (HEXAVALENT)	Soluble	0.8	75	125	69.28, pH adjusted 64.0	85-115
NFS-PDI-BB14B-4.5-5.0	JC27804-14T	CHROMIUM (HEXAVALENT)	Insoluble	86.3	75	125		

Lab Duplicates

Sample ID	Lab ID	Analyte	Sample Result	Qual	Duplicate Result	Qual	QL	Units	RPD	Action
NFS-PDI-BB14B-0.5-1.0	JC27804-10	CHROMIUM (HEXAVALENT)	0.96		0.53		0.45	mg/kg	57.7	SR<4xRL, Abs Diff<RL, Accept
NFS-PDI-BB14B-0.5-1.0	JC27804-10R	CHROMIUM (HEXAVALENT)	1.3		2.4		0.45	mg/kg	59.5	SR>4xRL, Abs Diff>RL, Estimate (J)
NFS-PDI-BB14B-4.5-5.0	JC27804-14	CHROMIUM (HEXAVALENT)	0.40	J	0.42		0.51	mg/kg	4.9	SR<4xRL, Abs Diff<RL, Accept
NFS-PDI-BB14B-4.5-5.0	JC27804-14T	CHROMIUM (HEXAVALENT)	0.37	J	0.51	U	0.51	mg/kg	31.8	SR<4xRL, Abs Diff<RL, Accept

Field Duplicates

Sample ID	Duplicate ID	Lab ID	Analyte	Sample Result	Qual	Duplicate Result	Qual	QL	Units	RPD	Action
NFS-PDI-BB13B-4.7-5.2	NFS-PDI-BB13B-4.7-5.2X	JC27804-4/5	CHROMIUM (HEXAVALENT)	34.9		1.9		0.52	mg/kg	179.3	SR>4xRL, Abs Diff>RL, Estimate (J)
NFS-PDI-BB14B-4.5-5.0	NFS-PDI-BB14B-4.5-5.0X	JC27804-12/14	CHROMIUM (HEXAVALENT)	1.4		0.4	B	0.51	mg/kg	111.1	SR>4xRL, Abs Diff>RL, Estimate (J)

Percent Solids

Sample ID	Percent Solids (%)	Status
NFS-PDI-BB13B-0.7-1.2	86.7	ok @50%
NFS-PDI-BB13B-2.7-3.2	88.9	ok @50%
NFS-PDI-BB13B-4.7-5.2	76.9	ok @50%
NFS-PDI-BB13B-4.7-5.2X	77.9	ok @50%
NFS-PDI-BB13B-6.7-7.2	80.3	ok @50%
NFS-PDI-BB13B-8.7-9.2	79.5	ok @50%
NFS-PDI-BB13B-9.0-9.5	76.5	ok @50%
NFS-PDI-BB13B-9.5-10.0	79.8	ok @50%
NFS-PDI-BB14B-0.5-1.0	89.5	ok @50%
NFS-PDI-BB14B-2.5-3.0	90.3	ok @50%
NFS-PDI-BB14B-4.5-5.0	79.1	ok @50%
NFS-PDI-BB14B-4.5-5.0X	78.1	ok @50%

Sample ID	Percent Solids (%)	Status
NFS-PDI-BB14B-6.5-7.0	77.6	ok @50%
NFS-PDI-BB14B-8.0-8.5	79.2	ok @50%
NFS-PDI-BB14B-8.5-9.0	84.4	ok @50%
NFS-PDI-CC14B-0.5-1.0	95	ok @50%
NFS-PDI-CC14B-10.5-11.0	86	ok @50%
NFS-PDI-CC14B-2.5-3.0	82.1	ok @50%
NFS-PDI-CC14B-4.5-5.0	81.9	ok @50%
NFS-PDI-CC14B-6.5-7.0	76.9	ok @50%
NFS-PDI-CC14B-7.5-8.0	85.1	ok @50%
NFS-PDI-CC14B-8.0-8.5	86.9	ok @50%
NFS-PDI-CC14B-8.5-9.0	82.8	ok @50%

SDG#: JC27804/ Method 7196

Batch: GN52468

Cr+6 ICAL 9/23/16

Soil

(p. 106 of data pkg)

x - concentration	y - response
0	0
0.01	0.009
0.05	0.038
0.1	0.082
0.3	0.246
0.5	0.408
0.8	0.652
1	0.850

(p. 106 of data pkg)

AECOM Calculated Offset	-0.0033	OK	Reported Offset	-0.0033
AECOM Slope	0.8374	OK	Reported Slope	0.8374
AECOM Calculated r	0.99962	OK	Reported r	0.99962

LCS calculation

GP253-B1

P. 80,106

Background Absorbance	0
Total absorbance	0.731
Total absorbance - background	0.731
Instrument Concentration	0.877
Sample weight (mg/kg)	0.0025
Final Volume (L)	0.1
Dilution Factor	1

AECOM Calculated LCS Result (mg/Kg)	35.1	OK	Reported Result (mg/Kg)	35.1
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%R = Found/True*100

GP253-B1

P. 80,106

True Value (mg/kg)	40
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AECOM Calculated %R	87.7	OK, rounding	Reported %R	87.8
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MS calculation

GP253-S2

P. 82,84,106

JC27804-10

Background reading	0
Total absorbance	0.446
Total absorbance - background	0.446
Instrument Concentration	0.5365
Sample weight (mg/kg)	0.00245
Final Volume (L)	0.1
Percent solids	0.895
Dilution Factor	50

AECOM Calculated MS Result (mg/Kg)	1223	OK, rounding	Reported Result (mg/Kg)	1220
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%R = Found/True*100

GP253-S2

P. 82,84,106

JC27804-10

True Value (mg/kg)	1430
Native concentration (mg/Kg)	0.96

AECOM %R	85.5	OK, rounding	Reported %R	85.2
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Percent Solids

JC27804-10

P. 84

NFS-PDI-BB14B-0.5-1.0

Empty dish weight=	22.32
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Wet weight= 29.65

Dry weight= 28.88

AECOM %solids =	89.5	OK	Reported %solids=	89.5
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Reporting Limit**JC27804-10****P. 24,84,106****NFS-PDI-BB14B-0.5-1.0**

Low Standard 0.01

Initial weight (mg/kg) 0.00241

Final volume (L) 0.1

Percent solids 0.895

Dilution Factor 1

Reporting Limit	0.46	OK, rounding	Reported RL (mg/Kg)=	0.45
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Sample Calculations**JC27804-10****P. 24,84,106****NFS-PDI-BB14B-0.5-1.0**

Background reading 0.002

Total absorbance 0.016

Total absorbance - background 0.014

Instrument Response 0.021

Sample weight (mg/kg) 0.00241

Final Volume (L) 0.1

Percent solids 0.895

Dilution Factor 1

AECOM Calculated Result (mg/Kg)	0.96	OK	Reported Result (mg/Kg)	0.96
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Associated w/ samples JC27804-2 through JC27804-13

SDG#: JC27804/ Method 7196

Batch: GN52506

Cr+6 ICAL 9/24/16

Soil

(p. 120 of data pkg)

x - concentration	y - response
0	0
0.01	0.009
0.05	0.041
0.1	0.079
0.3	0.235
0.5	0.403
0.8	0.630
1	0.803

(p. 120 of data pkg)

AECOM Calculated Offset	-0.0002	OK	Reported Offset	-0.0002
AECOM Slope	0.7978	OK	Reported Slope	0.7978
AECOM Calculated r	0.99990	OK	Reported r	0.99990

LCS calculation

GP254-B1

P. 80,120

Background Absorbance	0
Total absorbance	0.774
Total absorbance - background	0.774
Instrument Concentration	0.970
Sample weight (mg/kg)	0.0025
Final Volume (L)	0.1
Dilution Factor	1

AECOM Calculated LCS Result (mg/Kg)	38.8	OK	Reported Result (mg/Kg)	38.8
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%R = Found/True*100

GP254-B1

P. 80,120

True Value (mg/kg)	40
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AECOM Calculated %R	97.0	OK	Reported %R	97.0
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MS calculation

GP254-S2

P. 82,85,120

JC27804-14

Background reading	0.003
Total absorbance	0.235
Total absorbance - background	0.232
Instrument Concentration	0.2911
Sample weight (mg/kg)	0.00248
Final Volume (L)	0.1
Percent solids	0.781
Dilution Factor	50

AECOM Calculated MS Result (mg/Kg)	751	OK	Reported Result (mg/Kg)	751
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%R = Found/True*100

GP254-S2

P. 82,85,120

JC27804-14

True Value (mg/kg)	1230
Native concentration (mg/Kg)	0.4

AECOM %R	61	OK	Reported %R	61
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Percent Solids

JC27804-14

P. 85

NFS-PDI-BB14B-4.5-5.0X

Empty dish weight= 22.92
 Wet weight= 30.41
 Dry weight= 28.77

AECOM %solids =	78.1	OK	Reported %solids=	78.1
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Reporting Limit	JC27804-14	P. 28,85,120	NFS-PDI-BB14B-4.5-5.0X
Low Standard	0.01		
Initial weight (mg/kg)	0.00253		
Final volume (L)	0.1		
Percent solids	0.781		
Dilution Factor	1		

Reporting Limit	0.51	OK	Reported RL (mg/Kg)=	0.51
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Sample Calculations	JC27804-14	P. 28,85,120	NFS-PDI-BB14B-4.5-5.0X
Background reading	0.025		
Total absorbance	0.031		
Total absorbance - background	0.006		
Instrument Response	0.008		
Sample weight (mg/kg)	0.00253		
Final Volume (L)	0.1		
Percent solids	0.781		
Dilution Factor	1		

AECOM Calculated Result (mg/Kg)	0.40	OK	Reported Result (mg/Kg)	0.40 B
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Associated w/ samples JC27804-13 through JC27804-24

SDG#: JC27804R/ Method 7196

Batch: GN53160

Cr+6 ICAL 10/8/16

Soil

(p. 90 of data pkg)

x - concentration	y - response
0	0
0.01	0.008
0.05	0.038
0.1	0.078
0.3	0.247
0.5	0.399
0.8	0.640
1	0.818

(p. 90 of data pkg)

AECOM Calculated Offset	-0.0016	OK	Reported Offset	-0.0016
AECOM Slope	0.8119	OK	Reported Slope	0.8119
AECOM Calculated r	0.99987	OK	Reported r	0.99987

LCS calculation

GP527-B1

P. 41,90

Background Absorbance

0

Total absorbance

0.669

Total absorbance - background

0.669

Instrument Concentration

0.826

Sample weight (mg/kg)

0.0025

Final Volume (L)

0.1

Dilution Factor

1

AECOM Calculated LCS Result (mg/Kg)	33.0	OK	Reported Result (mg/Kg)	33.0
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%R = Found/True*100

GP527-B1

P. 41,90

True Value (mg/kg)

40

AECOM Calculated %R	82.6	OK, rounding	Reported %R	82.5
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MS calculation

GP527-S2

P. 43,50,90

JC27804-10R

Background reading

0

Total absorbance

0.292

Total absorbance - background

0.292

Instrument Concentration

0.3616

Sample weight (mg/kg)

0.00254

Final Volume (L)

0.1

Percent solids

0.895

Dilution Factor

50

AECOM Calculated MS Result (mg/Kg)	795	OK	Reported Result (mg/Kg)	795
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%R = Found/True*100

GP527-S2

P. 43,50,90

JC27804-10R

True Value (mg/kg)

779

Native concentration (mg/Kg)

1.3

AECOM %R	101.9	OK, rounding	Reported %R	102.0
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Percent Solids

JC27804-10R

P. 50

NFS-PDI-BB14B-0.5-1.0

Empty dish weight=

22.32

Wet weight= 29.65
 Dry weight= 28.88

AECOM %solids =	89.5	OK	Reported %solids=	89.5
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Reporting Limit	JC27804-10R	P. 17,50,90	NFS-PDI-BB14B-0.5-1.0
Low Standard	0.01		
Initial weight (mg/kg)	0.00257		
Final volume (L)	0.1		
Percent solids	0.895		
Dilution Factor	1		

Reporting Limit	0.43	OK, rounding	Reported RL (mg/Kg)=	0.45
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Sample Calculations	JC27804-10R	P. 17,50,90	NFS-PDI-BB14B-0.5-1.0
Background reading	0.018		
Total absorbance	0.041		
Total absorbance - background	0.023		
Instrument Response	0.030		
Sample weight (mg/kg)	0.00257		
Final Volume (L)	0.1		
Percent solids	0.895		
Dilution Factor	1		

AECOM Calculated Result (mg/Kg)	1.3	OK	Reported Result (mg/Kg)	1.3
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Associated w/ samples JC27804-2R through JC27804-13R

SDG#: JC27804T/ Method 7196

Batch: GN53241

Cr+6 ICAL 10/11/16

Soil

(p. 91 of data pkg)

x - concentration	y - response
0	0
0.01	0.009
0.05	0.044
0.1	0.082
0.3	0.241
0.5	0.411
0.8	0.650
1	0.833

(p. 91 of data pkg)

AECOM Calculated Offset	-0.0008	OK	Reported Offset	-0.001
AECOM Slope	0.8248	OK	Reported Slope	0.8248
AECOM Calculated r	0.99985	OK	Reported r	0.99985

LCS calculation

GP572-B1

P.49, 91

Background Absorbance	0
Total absorbance	0.764
Total absorbance - background	0.764
Instrument Concentration	0.927
Sample weight (mg/kg)	0.0025
Final Volume (L)	0.1
Dilution Factor	1

AECOM Calculated LCS Result (mg/Kg)	37.1	OK	Reported Result (mg/Kg)	37.1
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%R = Found/True*100

GP572-B1

P.49, 91

True Value (mg/kg)	40
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AECOM Calculated %R	92.7	OK, rounding	Reported %R	92.8
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MS calculation

GP572-S2

P. 51,57,91

JC27804-14T

Background reading	0
Total absorbance	0.343
Total absorbance - background	0.343
Instrument Concentration	0.4168
Sample weight (mg/kg)	0.00247
Final Volume (L)	0.1
Percent solids	0.781
Dilution Factor	50

AECOM Calculated MS Result (mg/Kg)	1080	OK	Reported Result (mg/Kg)	1080
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%R = Found/True*100

GP572-S2

P. 51,57,91

JC27804-14T

True Value (mg/kg)	1250
Native concentration (mg/Kg)	0.37

AECOM%R	86.4	OK, rounding	Reported %R	86.3
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Percent Solids

JC27804-14T

P. 57

NFS-PDI-BB14B-4.5-5.0

Empty dish weight=	22.92
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Wet weight= 30.41

Dry weight= 28.77

AECOM %solids =	78.1	OK	Reported %solids=	78.1
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Reporting Limit**JC27804-14T****P. 9,57,91****NFS-PDI-BB14B-4.5-5.0**

Low Standard 0.01

Initial weight (mg/kg) 0.00246

Final volume (L) 0.1

Percent solids 0.781

Dilution Factor 1

Reporting Limit	0.52	OK, rounding	Reported RL (mg/Kg)=	0.51
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Sample Calculations**JC27804-14T****P. 9,57,91****NFS-PDI-BB14B-4.5-5.0**

Background reading 0.063

Total absorbance 0.068

Total absorbance - background 0.005

Instrument Response 0.007

Sample weight (mg/kg) 0.00246

Final Volume (L) 0.1

Percent solids 0.781

Dilution Factor 1

AECOM Calculated Result (mg/Kg)	0.37	OK	Reported Result (mg/Kg)	0.37 B
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Associated w/samples JC27804-14T through JC27804-24T

Data Validation Report

Project:	PPG - North Forest Street PDI
Laboratory:	SGS/Accutest, Dayton, NJ
Laboratory Job No.:	JC27804A
Analysis/Method:	Volatile Organic Compounds (VOCs) by GCMS/SW-846 8260C Semivolatile Organic Compounds (SVOCs) by GCMS/SW-846 8270D TAL Metals SW-846 3010A/3050B/6010C/7470A/7471B
Validation Level:	Limited
Site Location/Address:	70 Carteret Avenue
AECOM Project No:	60314351.GA.DE.PDI.NFS
Prepared by:	Charlene Livingston Flint /AECOM Completed on: 11/03/2016
Reviewed by:	Kristin Rutherford /AECOM File Name: JC27804A_2016-11-03_DVReport-F

Introduction

The data were reviewed in accordance with the FSP-QAPP and the following NJDEP and / or Region 2 validation Standard Operating Procedure(s) (SOP):

- NJDEP Office of Data Quality SOP 5.A.16, Rev 1 (May 2002), Quality Assurance Data Validation of Analytical Deliverables for Inorganics (based on USEPA SW-846 Methods);
- ICP-AES Data Validation, SOP No. HW-3a Revision 0 (July 2015);
- Mercury and Cyanide Data Validation, SOP No. HW-3c Revision 0 (July 2015);
- Low/Medium Volatile Data Validation, SOP No. HW-33A Revision 0 (July 2015);
- Semivolatile Data Validation SOP No. HW-35A Revision 0 (June 2015).

The results of quality control data analyzed with site samples were used to assess the overall reliability of the data. The following qualifiers were used to identify data quality issues:

- U: Indicates the analyte was not detected in the sample above the sample reporting limit.
- J: Indicates the result was an estimated value; the associated numerical value was an approximate concentration of the analyte in the sample.
- UJ: Indicates the analyte was not detected above the reporting limit and the reporting limit was approximate.
- UB: The analyte concentration is less than or equal to three (3) times the concentration in the associated method/prep blank. The presence of the analyte in the sample is negated (UB) due to laboratory contamination.

- JB: The analyte concentration is greater than three (3) times, but less than or equal to ten (10) times the concentration in the associated method/prep blank. The presence of that analyte in the sample is considered "real". The concentration is quantitatively qualified (JB) due to method blank contamination.
- R: The sample result was rejected due to serious deficiencies; the presence or absence of the analyte could not be confirmed.
- RA: The sample result was rejected due to NJ specific data validation QC requirements; however, the result is usable for project objectives. Refer to the Data Quality and Usability section in this data validation report for further discussion.

Sample Information

The samples listed below were collected by AECOM on September 16, 2016 as part of the PPG - North Forest Street PDI sampling at 70 Carteret Avenue, Jersey City, New Jersey. Only the samples and parameters listed below were validated.

Field ID	Laboratory ID	Matrix	Fraction
NFS-PDI-FB20160916 (Equipment Blank)	JC27804-1A	Aqueous	TAL Metals, SVOCs and VOCs
NFS-PDI-CC14B-0.5-1.0	JC27804-17A	Soil	TAL Metals, SVOCs and VOCs
NFS-PDI-CC14B-10.5-11.0	JC27804-18A	Soil	TAL Metals, SVOCs and VOCs
NFS-PDI-CC14B-2.5-3.0	JC27804-19A	Soil	TAL Metals, SVOCs and VOCs
NFS-PDI-CC14B-4.5-5.0	JC27804-20A	Soil	TAL Metals, SVOCs and VOCs
NFS-PDI-CC14B-6.5-7.0	JC27804-21A	Soil	TAL Metals, SVOCs and VOCs
NFS-PDI-CC14B-7.5-8.0	JC27804-22A	Soil	TAL Metals, SVOCs and VOCs
NFS-PDI-CC14B-8.0-8.5	JC27804-23A	Soil	TAL Metals, SVOCs and VOCs
NFS-PDI-CC14B-8.5-9.0	JC27804-24A	Soil	TAL Metals, SVOCs and VOCs

The samples were collected following the procedures detailed in the Work Order for Garfield Avenue Remedial Action (GARA) at 70 Carteret Avenue and the Field Sampling Plan/Quality Assurance Project Plan for Non-Residential and Residential Chromium Sites Hudson County, New Jersey (December 2011).

General Comments

The data package was complete. Quality control (QC) issues identified during validation are discussed below. Refer to the Target Analyte Summary Hit(s) in Attachment A for a listing of all detected results, qualified results, and associated qualifications, where applicable. The nonconformances for each section discussed below are presented in Attachment B.

TAL Metals

Laboratory Blanks/Equipment Blanks

Aluminum, calcium, iron, manganese, nickel and zinc were detected in the method blank (MB) MP96054, associated with all of the soil samples in this data set with the exception of NFS-PDI-CC14B-8.0-8.5 (JC27804-23A). These compounds were detected in the associated soil samples at concentrations greater than ten times the amount in the method blank; therefore, no qualifications were made.

Aluminum, barium, calcium, copper, iron, manganese, nickel, sodium and zinc were detected in the method blank MP96126, associated with soil sample NFS-PDI-CC14B-8.0-8.5 (JC27804-23A). With the exception of copper, all of these analytes were detected in the associated soil sample at concentrations greater than ten times the amount in the method blank; therefore, no qualifications were made. Copper was detected in sample NFS-PDI-CC14B-8.0-8.5 (JC27804-23A) at a concentration less than three times the amount in the method blank; therefore, copper was negated (UB) at the reporting limit (RL) in this sample.

Zinc was detected in the aqueous method blank, MP96078, associated with the equipment blank NFS-PDI-FB20160916 (JC27804-1A), at a concentration greater than the method detection limit (MDL) but less than the RL. Since the result for zinc in the equipment blank was less than three times the amount in the method blank, the result for zinc in the equipment blank was negated (UB) at the RL.

Mercury, sodium, nickel and manganese were detected in the equipment blank, NFS-PDI-FB20160916, associated with the soil samples in this data set. Nickel, manganese, and sodium were detected in the associated soil samples at concentrations greater than ten times the amount in the equipment blank; therefore, no qualifications were made for these analytes.

Mercury was detected in samples NFS-PDI-CC14B-2.5-3.0 (JC27804-19A) and NFS-PDI-CC14B-7.5-8.0 (JC27804-20A) at concentrations greater than ten times the amount in the equipment blank; therefore, no qualifications were made for mercury on these samples. Mercury was greater than three times but less than ten times the amount in the equipment blank in samples NFS-PDI-CC14B-6.5-7.0 (JC27804-21A) and NFS-PDI-CC14B-7.5-8.0 (JC27804-22A); therefore, the results were qualified as estimated (J) in these samples. In addition, mercury was detected at concentrations less than three times the amount in the equipment blank in samples NFS-PDI-CC14B-0.5-1.0 (JC27804-17A), NFS-PDI-CC14B-10.5-11.0 (JC27804-18A), NFS-PDI-CC14B-8.0-8.5 (JC27804-23A), and NFS-PDI-CC14B-8.5-9.0 (JC27804-24A); therefore, the results were negated (U) at the RL in these samples.

Refer to the Target Analyte Summary Hit(s) in Attachment A for a listing of all results qualified on the basis of method and equipment blank contamination. Refer to the nonconformance tables in Appendix B for a listing of blank results and associated qualification actions.

Matrix Spike

Sample NFS-PDI-CC14B-8.0-8.5 (JC27804-23A) was analyzed as a matrix spike/matrix spike duplicate (MS/MSD) in this SDG.

The MS/MSD recoveries (%R) for antimony were below the QC limits; therefore, antimony was qualified as estimated (J) in sample NFS-PDI-CC14B-8.0-8.5 with a possible low bias.

The recoveries of aluminum and iron were outside the QC limits in the MS/MSD. Since the sample results for these analytes were greater than four times the amount spiked, no qualifications were made for aluminum or iron.

Sample Results

Reported results (flagged B by the laboratory) that were less than the RL, but greater than or equal to the method detection limit (MDL), are approximate values and have been qualified as estimated (J).

VOCs

Sample Results

Reported results (flagged J by the laboratory) that were less than the RL, but greater than or equal to the MDL, are approximate values and have been qualified as estimated (J).

SVOCs

Laboratory Control Sample (LCS)

The LCS associated with all soil samples except NFS-PDI-CC14B-0.5-1.0 (JC27804-17A) and NFS-PDI-CC14B-8.0-8.5 (JC27804-23A) exceeded the LCS %R QC limits for acenaphthylene, bis(2-chloroethoxy)methane and bis(2-chloroethyl)ether. Acenaphthylene was detected in sample NFS-PDI-CC14B-2.5-3.0 (JC27804-19A) and was qualified as estimated (J) with a possible high bias. Since the bias was high and the other associated samples were nondetect for these compounds, no qualifications were made.

Sample Results

The nondetect result for 2,4-dinitrophenol in sample NFS-PDI-CC14B-0.5-1.0 (JC27804-17A) exceeded the NJDEP Default Impact to Ground Water Soil Screening Level (DIGWSSL); therefore, the nondetect result may not meet project objectives. Refer to the nonconformance tables in Appendix B for a listing of results exceeding the NJDEP DIGWSSL criteria.

Reported results (flagged J by the laboratory), that were less than the RL, but greater than or equal to the MDL are approximate values and have been qualified as estimated (J).

Data Quality and Usability

The following issues were noted for this sample set:

- Copper was negated at the RL in sample NFS-PDI-CC14B-8.0-8.5 (JC27804-23A) due to method blank contamination.
- The result for zinc in the equipment blank was negated at the RL due to method blank contamination.
- Mercury was estimated in samples NFS-PDI-CC14B-6.5-7.0 (JC27804-21A) and NFS-PDI-CC14B-7.5-8.0 (JC27804-22A) due to equipment blank contamination. In addition, mercury was negated at the RL in samples NFS-PDI-CC14B-0.5-1.0 (JC27804-17A), NFS-PDI-CC14B-10.5-11.0 (JC27804-18A), NFS-PDI-CC14B-8.0-8.5 (JC27804-23A) and NFS-PDI-CC14B-8.5-9.0 (JC27804-24A) due to equipment blank contamination.
- The result for antimony in sample NFS-PDI-CC14B-8.0-8.5 (JC27804-23A) was estimated with a possible low bias due to low MS/MSD recovery.
- The result for acenaphthylene in sample NFS-PDI-CC14B-2.5-3.0 (JC27804-19A) was estimated with a possible high bias due to high LCS recovery.
- The nondetect result for 2,4-dinitrophenol in sample NFS-PDI-CC14B-0.5-1.0 (JC27804-17A) exceeded the NJDEP DIGWSSL; therefore, the nondetect result may not meet project objectives.

- Sample results reported between the MDL and RL were estimated with an unknown directional bias.

ATTACHMENTS

Attachment A: Target Analyte Summary Hit List(s)

Attachment B: Data Validation Report Form

Attachment A

Target Analyte Summary Hit List(s)

Soil Target Analyte Summary Hit List (TAL Metals)

Site Name PPG - North Forest Street PDI
Sampling Date September 16, 2016
Lab Name/ID SGS/Accutest, Dayton, NJ
SDG No JC27804A
Sample Matrix Soil
Trip Blank ID NA
Field Blank ID NFS-PDI-FB20160916

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
NFS-PDI-CC14B-0.5-1.0	JC27804-17A	ALUMINUM	6.7	4850	4850	52		
NFS-PDI-CC14B-0.5-1.0	JC27804-17A	ARSENIC	U	1.5B	1.5	2.1	Qualify	5
NFS-PDI-CC14B-0.5-1.0	JC27804-17A	BARIUM	U	110	110	21		
NFS-PDI-CC14B-0.5-1.0	JC27804-17A	BERYLLIUM	U	0.37	0.37	0.21		
NFS-PDI-CC14B-0.5-1.0	JC27804-17A	CADMIUM	U	0.12B	0.12	0.52	Qualify	5
NFS-PDI-CC14B-0.5-1.0	JC27804-17A	CALCIUM METAL	19.3	4460	4460	520		
NFS-PDI-CC14B-0.5-1.0	JC27804-17A	CHROMIUM	U	52.1	52.1	1.0		
NFS-PDI-CC14B-0.5-1.0	JC27804-17A	COBALT	U	5.3	5.3	5.2		
NFS-PDI-CC14B-0.5-1.0	JC27804-17A	COPPER	U	17.9	17.9	2.6		
NFS-PDI-CC14B-0.5-1.0	JC27804-17A	IRON	1.9	4500	4500	52		
NFS-PDI-CC14B-0.5-1.0	JC27804-17A	LEAD	U	22.7	22.7	2.1		
NFS-PDI-CC14B-0.5-1.0	JC27804-17A	MAGNESIUM	U	1320	1320	520		
NFS-PDI-CC14B-0.5-1.0	JC27804-17A	MANGANESE	0.038	83.8	83.8	1.5		
NFS-PDI-CC14B-0.5-1.0	JC27804-17A	NICKEL	0.076	19.0	19.0	4.1		
NFS-PDI-CC14B-0.5-1.0	JC27804-17A	POTASSIUM	U	301B	301	1000	Qualify	5
NFS-PDI-CC14B-0.5-1.0	JC27804-17A	SELENIUM	U	0.80B	0.80	2.1	Qualify	5
NFS-PDI-CC14B-0.5-1.0	JC27804-17A	SILVER	U	0.77	0.77	0.52		
NFS-PDI-CC14B-0.5-1.0	JC27804-17A	SODIUM	U	445B	445	1000	Qualify	2,5

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
NFS-PDI-CC14B-0.5-1.0	JC27804-17A	VANADIUM	U	20.7	20.7	5.2		
NFS-PDI-CC14B-0.5-1.0	JC27804-17A	ZINC	1.0	70.2	70.2	5.2		
NFS-PDI-CC14B-10.5-11.0	JC27804-18A	ALUMINUM	6.7	8150	8150	59		
NFS-PDI-CC14B-10.5-11.0	JC27804-18A	ARSENIC	U	3.5	3.5	2.4		
NFS-PDI-CC14B-10.5-11.0	JC27804-18A	BARIUM	U	35.0	35.0	24		
NFS-PDI-CC14B-10.5-11.0	JC27804-18A	BERYLLIUM	U	0.56	0.56	0.24		
NFS-PDI-CC14B-10.5-11.0	JC27804-18A	CADMIUM	U	0.13B	0.13	0.59	Qualify	5
NFS-PDI-CC14B-10.5-11.0	JC27804-18A	CALCIUM METAL	19.3	1040	1040	590		
NFS-PDI-CC14B-10.5-11.0	JC27804-18A	CHROMIUM	U	25.4	25.4	1.2		
NFS-PDI-CC14B-10.5-11.0	JC27804-18A	COBALT	U	5.9	5.9	5.9		
NFS-PDI-CC14B-10.5-11.0	JC27804-18A	COPPER	U	10.1	10.1	3.0		
NFS-PDI-CC14B-10.5-11.0	JC27804-18A	IRON	1.9	12900	12900	59		
NFS-PDI-CC14B-10.5-11.0	JC27804-18A	LEAD	U	10.5	10.5	2.4		
NFS-PDI-CC14B-10.5-11.0	JC27804-18A	MAGNESIUM	U	2670	2670	590		
NFS-PDI-CC14B-10.5-11.0	JC27804-18A	MANGANESE	0.038	219	219	1.8		
NFS-PDI-CC14B-10.5-11.0	JC27804-18A	NICKEL	0.076	11.0	11.0	4.7		
NFS-PDI-CC14B-10.5-11.0	JC27804-18A	POTASSIUM	U	1030B	1030	1200	Qualify	5
NFS-PDI-CC14B-10.5-11.0	JC27804-18A	SILVER	U	1.3	1.3	0.59		
NFS-PDI-CC14B-10.5-11.0	JC27804-18A	SODIUM	U	91.5B	91.5	1200	Negate	1
NFS-PDI-CC14B-10.5-11.0	JC27804-18A	VANADIUM	U	21.1	21.1	5.9		
NFS-PDI-CC14B-10.5-11.0	JC27804-18A	ZINC	1.0	38.1	38.1	5.9		
NFS-PDI-CC14B-2.5-3.0	JC27804-19A	ALUMINUM	6.7	7990	7990	62		
NFS-PDI-CC14B-2.5-3.0	JC27804-19A	ANTIMONY	U	0.76B	0.76	2.5	Qualify	5
NFS-PDI-CC14B-2.5-3.0	JC27804-19A	ARSENIC	U	20.1	20.1	2.5		
NFS-PDI-CC14B-2.5-3.0	JC27804-19A	BARIUM	U	133	133	25		
NFS-PDI-CC14B-2.5-3.0	JC27804-19A	BERYLLIUM	U	1.1	1.1	0.25		

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
NFS-PDI-CC14B-2.5-3.0	JC27804-19A	CADMIUM	U	0.50B	0.50	0.62	Qualify	5
NFS-PDI-CC14B-2.5-3.0	JC27804-19A	CALCIUM METAL	19.3	2530	2530	620		
NFS-PDI-CC14B-2.5-3.0	JC27804-19A	CHROMIUM	U	41.1	41.1	1.2		
NFS-PDI-CC14B-2.5-3.0	JC27804-19A	COBALT	U	34.7	34.7	6.2		
NFS-PDI-CC14B-2.5-3.0	JC27804-19A	COPPER	U	102	102	6.2		
NFS-PDI-CC14B-2.5-3.0	JC27804-19A	IRON	1.9	40300	40300	120		
NFS-PDI-CC14B-2.5-3.0	JC27804-19A	LEAD	U	73.5	73.5	5.0		
NFS-PDI-CC14B-2.5-3.0	JC27804-19A	MAGNESIUM	U	1620	1620	620		
NFS-PDI-CC14B-2.5-3.0	JC27804-19A	MANGANESE	0.038	334	334	3.7		
NFS-PDI-CC14B-2.5-3.0	JC27804-19A	NICKEL	0.076	60.5	60.5	5.0		
NFS-PDI-CC14B-2.5-3.0	JC27804-19A	POTASSIUM	U	695B	695	1200	Qualify	5
NFS-PDI-CC14B-2.5-3.0	JC27804-19A	SELENIUM	U	1.3B	1.3	5.0	Qualify	5
NFS-PDI-CC14B-2.5-3.0	JC27804-19A	SILVER	U	2.7	2.7	1.2		
NFS-PDI-CC14B-2.5-3.0	JC27804-19A	SODIUM	U	197B	197	1200	Qualify	2,5
NFS-PDI-CC14B-2.5-3.0	JC27804-19A	VANADIUM	U	45.1	45.1	6.2		
NFS-PDI-CC14B-2.5-3.0	JC27804-19A	ZINC	1.0	398	398	6.2		
NFS-PDI-CC14B-4.5-5.0	JC27804-20A	ALUMINUM	6.7	13400	13400	63		
NFS-PDI-CC14B-4.5-5.0	JC27804-20A	ARSENIC	U	4.7	4.7	2.5		
NFS-PDI-CC14B-4.5-5.0	JC27804-20A	BARIUM	U	69.8	69.8	25		
NFS-PDI-CC14B-4.5-5.0	JC27804-20A	BERYLLIUM	U	0.73	0.73	0.25		
NFS-PDI-CC14B-4.5-5.0	JC27804-20A	CADMIUM	U	0.13B	0.13	0.63	Qualify	5
NFS-PDI-CC14B-4.5-5.0	JC27804-20A	CALCIUM METAL	19.3	3950	3950	630		
NFS-PDI-CC14B-4.5-5.0	JC27804-20A	CHROMIUM	U	22.2	22.2	1.3		
NFS-PDI-CC14B-4.5-5.0	JC27804-20A	COBALT	U	8.2	8.2	6.3		
NFS-PDI-CC14B-4.5-5.0	JC27804-20A	COPPER	U	23.5	23.5	3.1		
NFS-PDI-CC14B-4.5-5.0	JC27804-20A	IRON	1.9	17100	17100	63		

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
NFS-PDI-CC14B-4.5-5.0	JC27804-20A	LEAD	U	77.6	77.6	2.5		
NFS-PDI-CC14B-4.5-5.0	JC27804-20A	MAGNESIUM	U	3180	3180	630		
NFS-PDI-CC14B-4.5-5.0	JC27804-20A	MANGANESE	0.038	300	300	1.9		
NFS-PDI-CC14B-4.5-5.0	JC27804-20A	NICKEL	0.076	21.4	21.4	5.0		
NFS-PDI-CC14B-4.5-5.0	JC27804-20A	POTASSIUM	U	875B	875	1300	Qualify	5
NFS-PDI-CC14B-4.5-5.0	JC27804-20A	SILVER	U	1.4	1.4	0.63		
NFS-PDI-CC14B-4.5-5.0	JC27804-20A	SODIUM	U	197B	197	1300	Qualify	2,5
NFS-PDI-CC14B-4.5-5.0	JC27804-20A	VANADIUM	U	19.8	19.8	6.3		
NFS-PDI-CC14B-4.5-5.0	JC27804-20A	ZINC	1.0	164	164	6.3		
NFS-PDI-CC14B-6.5-7.0	JC27804-21A	ALUMINUM	6.7	12100	12100	67		
NFS-PDI-CC14B-6.5-7.0	JC27804-21A	ARSENIC	U	4.6	4.6	2.7		
NFS-PDI-CC14B-6.5-7.0	JC27804-21A	BARIUM	U	51.8	51.8	27		
NFS-PDI-CC14B-6.5-7.0	JC27804-21A	BERYLLIUM	U	0.58	0.58	0.27		
NFS-PDI-CC14B-6.5-7.0	JC27804-21A	CADMIUM	U	0.16B	0.16	0.67	Qualify	5
NFS-PDI-CC14B-6.5-7.0	JC27804-21A	CALCIUM METAL	19.3	2180	2180	670		
NFS-PDI-CC14B-6.5-7.0	JC27804-21A	CHROMIUM	U	19.1	19.1	1.3		
NFS-PDI-CC14B-6.5-7.0	JC27804-21A	COBALT	U	9.0	9.0	6.7		
NFS-PDI-CC14B-6.5-7.0	JC27804-21A	COPPER	U	29.0	29.0	3.4		
NFS-PDI-CC14B-6.5-7.0	JC27804-21A	IRON	1.9	18800	18800	67		
NFS-PDI-CC14B-6.5-7.0	JC27804-21A	LEAD	U	171	171	2.7		
NFS-PDI-CC14B-6.5-7.0	JC27804-21A	MAGNESIUM	U	3190	3190	670		
NFS-PDI-CC14B-6.5-7.0	JC27804-21A	MANGANESE	0.038	271	271	2.0		
NFS-PDI-CC14B-6.5-7.0	JC27804-21A	NICKEL	0.076	18.3	18.3	5.4		
NFS-PDI-CC14B-6.5-7.0	JC27804-21A	POTASSIUM	U	913B	913	1300	Qualify	5
NFS-PDI-CC14B-6.5-7.0	JC27804-21A	SILVER	U	1.6	1.6	0.67		
NFS-PDI-CC14B-6.5-7.0	JC27804-21A	SODIUM	U	194B	194	1300	Qualify	2,5

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
NFS-PDI-CC14B-6.5-7.0	JC27804-21A	VANADIUM	U	19.0	19.0	6.7		
NFS-PDI-CC14B-6.5-7.0	JC27804-21A	ZINC	1.0	280	280	6.7		
NFS-PDI-CC14B-7.5-8.0	JC27804-22A	ALUMINUM	U	14100	14100	58		
NFS-PDI-CC14B-7.5-8.0	JC27804-22A	ARSENIC	U	5.1	5.1	2.3		
NFS-PDI-CC14B-7.5-8.0	JC27804-22A	BARIUM	U	39.7	39.7	23		
NFS-PDI-CC14B-7.5-8.0	JC27804-22A	BERYLLIUM	U	0.57	0.57	0.23		
NFS-PDI-CC14B-7.5-8.0	JC27804-22A	CALCIUM METAL	19.3	794	794	580		
NFS-PDI-CC14B-7.5-8.0	JC27804-22A	CHROMIUM	U	17.4	17.4	1.2		
NFS-PDI-CC14B-7.5-8.0	JC27804-22A	COBALT	U	9.8	9.8	5.8		
NFS-PDI-CC14B-7.5-8.0	JC27804-22A	COPPER	U	29.5	29.5	2.9		
NFS-PDI-CC14B-7.5-8.0	JC27804-22A	IRON	1.9	23400	23400	58		
NFS-PDI-CC14B-7.5-8.0	JC27804-22A	LEAD	U	12.9	12.9	2.3		
NFS-PDI-CC14B-7.5-8.0	JC27804-22A	MAGNESIUM	U	3820	3820	580		
NFS-PDI-CC14B-7.5-8.0	JC27804-22A	MANGANESE	0.038	301	301	1.7		
NFS-PDI-CC14B-7.5-8.0	JC27804-22A	NICKEL	0.076	18.0	18.0	4.7		
NFS-PDI-CC14B-7.5-8.0	JC27804-22A	POTASSIUM	U	1100B	1100	1200	Qualify	5
NFS-PDI-CC14B-7.5-8.0	JC27804-22A	SILVER	U	1.6	1.6	0.58		
NFS-PDI-CC14B-7.5-8.0	JC27804-22A	SODIUM	U	495B	495	1200	Qualify	2,6
NFS-PDI-CC14B-7.5-8.0	JC27804-22A	VANADIUM	U	22.5	22.5	5.8		
NFS-PDI-CC14B-7.5-8.0	JC27804-22A	ZINC	1.0	67.1	67.1	5.8		
NFS-PDI-CC14B-8.0-8.5	JC27804-23A	ALUMINUM	3.7	12300	12300	50		
NFS-PDI-CC14B-8.0-8.5	JC27804-23A	ANTIMONY	U	0.66B	0.66	2.0	Qualify	4,5
NFS-PDI-CC14B-8.0-8.5	JC27804-23A	ARSENIC	U	6.7	6.7	2.0		
NFS-PDI-CC14B-8.0-8.5	JC27804-23A	BARIUM	0.14	30.9	30.9	20		
NFS-PDI-CC14B-8.0-8.5	JC27804-23A	BERYLLIUM	U	0.47	0.47	0.20		
NFS-PDI-CC14B-8.0-8.5	JC27804-23A	CALCIUM METAL	19.0	1260	1260	500		

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
NFS-PDI-CC14B-8.0-8.5	JC27804-23A	CHROMIUM	U	18.0	18.0	0.99		
NFS-PDI-CC14B-8.0-8.5	JC27804-23A	COBALT	U	5.3	5.3	5.0		
NFS-PDI-CC14B-8.0-8.5	JC27804-23A	COPPER	7.0	12.0B	U	15	Negate	3
NFS-PDI-CC14B-8.0-8.5	JC27804-23A	IRON	20.8	21400	21400	50		
NFS-PDI-CC14B-8.0-8.5	JC27804-23A	LEAD	U	9.0	9.0	2.0		
NFS-PDI-CC14B-8.0-8.5	JC27804-23A	MAGNESIUM	U	2320	2320	500		
NFS-PDI-CC14B-8.0-8.5	JC27804-23A	MANGANESE	0.24	171	171	1.5		
NFS-PDI-CC14B-8.0-8.5	JC27804-23A	NICKEL	0.21	10.2	10.2	4.0		
NFS-PDI-CC14B-8.0-8.5	JC27804-23A	POTASSIUM	U	836B	836	990	Qualify	5
NFS-PDI-CC14B-8.0-8.5	JC27804-23A	SILVER	U	0.40B	0.40	0.50	Qualify	5
NFS-PDI-CC14B-8.0-8.5	JC27804-23A	SODIUM	8.9	335B	335	990	Qualify	2,5
NFS-PDI-CC14B-8.0-8.5	JC27804-23A	THALLIUM	U	0.42B	0.42	0.99	Qualify	5
NFS-PDI-CC14B-8.0-8.5	JC27804-23A	VANADIUM	U	32.5	32.5	5.0		
NFS-PDI-CC14B-8.0-8.5	JC27804-23A	ZINC	0.42	27.3	27.3	5.0		
NFS-PDI-CC14B-8.5-9.0	JC27804-24A	ALUMINUM	U	9540	9540	62		
NFS-PDI-CC14B-8.5-9.0	JC27804-24A	ARSENIC	U	6.8	6.8	2.5		
NFS-PDI-CC14B-8.5-9.0	JC27804-24A	BARIUM	U	28.0	28.0	25		
NFS-PDI-CC14B-8.5-9.0	JC27804-24A	BERYLLIUM	U	0.53	0.53	0.25		
NFS-PDI-CC14B-8.5-9.0	JC27804-24A	CALCIUM METAL	19.3	1050	1050	620		
NFS-PDI-CC14B-8.5-9.0	JC27804-24A	CHROMIUM	U	16.9	16.9	1.2		
NFS-PDI-CC14B-8.5-9.0	JC27804-24A	COBALT	U	7.0	7.0	6.2		
NFS-PDI-CC14B-8.5-9.0	JC27804-24A	COPPER	U	8.3	8.3	3.1		
NFS-PDI-CC14B-8.5-9.0	JC27804-24A	IRON	1.9	21400	21400	62		
NFS-PDI-CC14B-8.5-9.0	JC27804-24A	LEAD	U	10.3	10.3	2.5		
NFS-PDI-CC14B-8.5-9.0	JC27804-24A	MAGNESIUM	U	2400	2400	620		
NFS-PDI-CC14B-8.5-9.0	JC27804-24A	MANGANESE	0.038	219	219	1.8		

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
NFS-PDI-CC14B-8.5-9.0	JC27804-24A	NICKEL	0.076	9.8	9.8	4.9		
NFS-PDI-CC14B-8.5-9.0	JC27804-24A	POTASSIUM	U	696B	696	1200	Qualify	5
NFS-PDI-CC14B-8.5-9.0	JC27804-24A	SILVER	U	1.8	1.8	0.62		
NFS-PDI-CC14B-8.5-9.0	JC27804-24A	SODIUM	U	197B	197	1200	Qualify	2,5
NFS-PDI-CC14B-8.5-9.0	JC27804-24A	VANADIUM	U	29.8	29.8	6.2		
NFS-PDI-CC14B-8.5-9.0	JC27804-24A	ZINC	1.0	30.8	30.8	6.2		
NFS-PDI-CC14B-0.5-1.0	JC27804-17A	MERCURY	U	0.027B	U	0.033	Negate	1
NFS-PDI-CC14B-10.5-11.0	JC27804-18A	MERCURY	U	0.017B	U	0.035	Negate	1
NFS-PDI-CC14B-2.5-3.0	JC27804-19A	MERCURY	U	0.43	0.43	0.037		
NFS-PDI-CC14B-4.5-5.0	JC27804-20A	MERCURY	U	0.57	0.57	0.037		
NFS-PDI-CC14B-6.5-7.0	JC27804-21A	MERCURY	U	0.072	0.072	0.034		
NFS-PDI-CC14B-7.5-8.0	JC27804-22A	MERCURY	U	0.032B	0.032	0.035	Qualify	5
NFS-PDI-CC14B-8.0-8.5	JC27804-23A	MERCURY	U	0.011B	U	0.036	Negate	1
NFS-PDI-CC14B-8.5-9.0	JC27804-24A	MERCURY	U	0.026B	U	0.036	Negate	1

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

NJDEP Laboratory Footnote

1. The value reported is less than or equal to three (3) times the value in the trip/field blank. It is the policy of NJDEP-DPFSR to negate the reported value as due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
2. The value reported is greater than three (3) but less than ten (10) times the value in the trip/field blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to the trip/field blank contamination.

3. The value reported is less than or equal to 3x the value in the method blank. It is the policy of NJDEP-DPFSR to negate the reported value due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
4. The reported value was qualified because the MS/MSD spike recovery was less than 75% for metals.
5. The reported result was greater than the MDL but less than the RL and therefore was estimated.

Aqueous Target Analyte Summary Hit List (TAL Metals)

Site Name PPG - North Forest Street PDI
Sampling Date September 16, 2016
Lab Name/ID SGS/Accutest, Dayton, NJ
SDG No JC27804A
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID NFS-PDI-FB20160916

Field Sample ID	Lab Sample ID	Analyte	Method Blank (ug/L)	Laboratory Sample Result (ug/L)	Validation Sample Result (ug/L)	RL (ug/L)	Quality Assurance Decision	NJDEP Validation Footnote
NFS-PDI-FB20160916	JC27804-1A	MANGANESE	U	0.40B	0.40	15	Qualify	2
NFS-PDI-FB20160916	JC27804-1A	NICKEL	U	1.4B	1.4	10	Qualify	2
NFS-PDI-FB20160916	JC27804-1A	SODIUM	U	54.7B	54.7	10000	Qualify	2
NFS-PDI-FB20160916	JC27804-1A	ZINC	8.6	16.7B	U	20	Negate	1
NFS-PDI-FB20160916	JC27804-1A	MERCURY	U	0.097B	0.097	0.20	Qualify	2

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

NJDEP Laboratory Footnote

1. The value reported is less than or equal to 3x the value in the method blank. It is the policy of NJDEP-DPFSR to negate the reported value due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
2. The reported result was greater than the MDL but less than the RL and therefore was estimated.

Soil Target Analyte Summary Hit List (VOCs)

Site Name PPG - North Forest Street PDI
Sampling Date September 16, 2016
Lab Name/ID SGS/Accutest, Dayton, NJ
SDG No JC27804A
Sample Matrix Soil
Trip Blank ID NA
Field Blank ID NFS-PDI-FB20160916

Field Sample ID	Lab Sample ID	Analyte	Method Blank (ug/kg)	Laboratory Sample Result (ug/kg)	Validation Sample Result (ug/kg)	RL (ug/kg)	Quality Assurance Decision	NJDEP Validation Footnote
NFS-PDI-CC14B-0.5-1.0	JC27804-17A	ACETONE	U	9.4J	9.4	18	Qualify	1
NFS-PDI-CC14B-10.5-11.0	JC27804-18A	METHYL-TERT-BUTYL ETHER	U	0.57J	0.57	1.1	Qualify	1
NFS-PDI-CC14B-2.5-3.0	JC27804-19A	ACETONE	U	47.7	47.7	14		
NFS-PDI-CC14B-4.5-5.0	JC27804-20A	2-BUTANONE (MEK)	U	8.2J	8.2	11	Qualify	1
NFS-PDI-CC14B-4.5-5.0	JC27804-20A	ACETONE	U	49.3	49.3	11		
NFS-PDI-CC14B-4.5-5.0	JC27804-20A	CARBON DISULFIDE	U	1.2J	1.2	2.2	Qualify	1
NFS-PDI-CC14B-6.5-7.0	JC27804-21A	2-BUTANONE (MEK)	U	13.4	13.4	12		
NFS-PDI-CC14B-6.5-7.0	JC27804-21A	ACETONE	U	48.3	48.3	12		
NFS-PDI-CC14B-6.5-7.0	JC27804-21A	BENZENE	U	0.33J	0.33	0.60	Qualify	1
NFS-PDI-CC14B-6.5-7.0	JC27804-21A	CARBON DISULFIDE	U	0.74J	0.74	2.4	Qualify	1
NFS-PDI-CC14B-7.5-8.0	JC27804-22A	ACETONE	U	15.4	15.4	12		
NFS-PDI-CC14B-7.5-8.0	JC27804-22A	CARBON DISULFIDE	U	1.2J	1.2	2.3	Qualify	1
NFS-PDI-CC14B-7.5-8.0	JC27804-22A	CIS-1,2-DICHLOROETHENE	U	0.75J	0.75	1.2	Qualify	1
NFS-PDI-CC14B-8.0-8.5	JC27804-23A	ACETONE	U	22.5	22.5	9.4		
NFS-PDI-CC14B-8.0-8.5	JC27804-23A	CARBON DISULFIDE	U	0.52J	0.52	1.9	Qualify	1
NFS-PDI-CC14B-8.5-9.0	JC27804-24A	2-BUTANONE (MEK)	U	2.8J	2.8	11	Qualify	1
NFS-PDI-CC14B-8.5-9.0	JC27804-24A	ACETONE	U	32.4	32.4	11		

Field Sample ID	Lab Sample ID	Analyte	Method Blank (ug/kg)	Laboratory Sample Result (ug/kg)	Validation Sample Result (ug/kg)	RL (ug/kg)	Quality Assurance Decision	NJDEP Validation Footnote
NFS-PDI-CC14B-8.5-9.0	JC27804-24A	CARBON DISULFIDE	U	1.8J	1.8	2.2	Qualify	1

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

NJDEP Laboratory Footnote

1. The reported result was greater than the MDL but less than the RL and therefore was estimated.

Soil Target Analyte Summary Hit List (SVOCs)

Site Name PPG - North Forest Street PDI
Sampling Date September 16, 2016
Lab Name/ID SGS/Accutest, Dayton, NJ
SDG No JC27804A
Sample Matrix Soil
Trip Blank ID NA
Field Blank ID NFS-PDI-FB20160916

Field Sample ID	Lab Sample ID	Analyte	Method Blank (ug/kg)	Laboratory Sample Result (ug/kg)	Validation Sample Result (ug/kg)	RL (ug/kg)	Quality Assurance Decision	NJDEP Validation Footnote
NFS-PDI-CC14B-0.5-1.0	JC27804-17A	ACENAPHTHYLENE	U	92.7J	92.7	170	Qualify	2
NFS-PDI-CC14B-0.5-1.0	JC27804-17A	BENZO(A)ANTHRACENE	U	127J	127	170	Qualify	2
NFS-PDI-CC14B-0.5-1.0	JC27804-17A	BENZO(A)PYRENE	U	270	270	170		
NFS-PDI-CC14B-0.5-1.0	JC27804-17A	BENZO(B)FLUORANTHENE	U	368	368	170		
NFS-PDI-CC14B-0.5-1.0	JC27804-17A	BENZO(G,H,I)PERYLENE	U	338	338	170		
NFS-PDI-CC14B-0.5-1.0	JC27804-17A	BENZO(K)FLUORANTHENE	U	104J	104	170	Qualify	2
NFS-PDI-CC14B-0.5-1.0	JC27804-17A	BIS(2-ETHYLHEXYL)PHTHALATE	U	373	373	350		
NFS-PDI-CC14B-0.5-1.0	JC27804-17A	CHRYSENE	U	232	232	170		
NFS-PDI-CC14B-0.5-1.0	JC27804-17A	DIBENZO(A,H)ANTHRACENE	U	78.8J	78.8	170	Qualify	2
NFS-PDI-CC14B-0.5-1.0	JC27804-17A	FLUORANTHENE	U	278	278	170		
NFS-PDI-CC14B-0.5-1.0	JC27804-17A	INDENO(1,2,3-CD)PYRENE	U	255	255	170		
NFS-PDI-CC14B-0.5-1.0	JC27804-17A	PHENANTHRENE	U	144J	144	170	Qualify	2
NFS-PDI-CC14B-0.5-1.0	JC27804-17A	PYRENE	U	346	346	170		
NFS-PDI-CC14B-2.5-3.0	JC27804-19A	1-1'-BIPHENYL	U	225	225	160		
NFS-PDI-CC14B-2.5-3.0	JC27804-19A	2-METHYLNAPHTHALENE	U	1010	1010	160		

Field Sample ID	Lab Sample ID	Analyte	Method Blank (ug/kg)	Laboratory Sample Result (ug/kg)	Validation Sample Result (ug/kg)	RL (ug/kg)	Quality Assurance Decision	NJDEP Validation Footnote
NFS-PDI-CC14B-2.5-3.0	JC27804-19A	3+4-METHYLPHENOL	U	393	393	160		
NFS-PDI-CC14B-2.5-3.0	JC27804-19A	ACENAPHTHENE	U	474	474	79		
NFS-PDI-CC14B-2.5-3.0	JC27804-19A	ACENAPHTHYLENE	U	69.1J	69.1	79	Qualify	1,2
NFS-PDI-CC14B-2.5-3.0	JC27804-19A	ANTHRACENE	U	881	881	79		
NFS-PDI-CC14B-2.5-3.0	JC27804-19A	BENZO(A)ANTHRACENE	U	1200	1200	79		
NFS-PDI-CC14B-2.5-3.0	JC27804-19A	BENZO(A)PYRENE	U	947	947	79		
NFS-PDI-CC14B-2.5-3.0	JC27804-19A	BENZO(B)FLUORANTHENE	U	1210	1210	79		
NFS-PDI-CC14B-2.5-3.0	JC27804-19A	BENZO(G,H,I)PERYLENE	U	532	532	79		
NFS-PDI-CC14B-2.5-3.0	JC27804-19A	BENZO(K)FLUORANTHENE	U	402	402	79		
NFS-PDI-CC14B-2.5-3.0	JC27804-19A	CARBAZOLE	U	291	291	160		
NFS-PDI-CC14B-2.5-3.0	JC27804-19A	CHRYSENE	U	1600	1600	79		
NFS-PDI-CC14B-2.5-3.0	JC27804-19A	DIBENZO(A,H)ANTHRACENE	U	181	181	79		
NFS-PDI-CC14B-2.5-3.0	JC27804-19A	DIBENZOFURAN	U	363	363	160		
NFS-PDI-CC14B-2.5-3.0	JC27804-19A	FLUORANTHENE	U	2400	2400	79		
NFS-PDI-CC14B-2.5-3.0	JC27804-19A	FLUORENE	U	583	583	79		
NFS-PDI-CC14B-2.5-3.0	JC27804-19A	INDENO(1,2,3-CD)PYRENE	U	595	595	79		
NFS-PDI-CC14B-2.5-3.0	JC27804-19A	NAPHTHALENE	U	769	769	79		
NFS-PDI-CC14B-2.5-3.0	JC27804-19A	NITROBENZENE	U	240	240	160		
NFS-PDI-CC14B-2.5-3.0	JC27804-19A	PHENANTHRENE	U	3070	3070	79		
NFS-PDI-CC14B-2.5-3.0	JC27804-19A	PHENOL	U	191	191	160		
NFS-PDI-CC14B-2.5-3.0	JC27804-19A	PYRENE	U	3140	3140	79		
NFS-PDI-CC14B-4.5-5.0	JC27804-20A	1-1'-BIPHENYL	U	22.0J	22.0	77	Qualify	2
NFS-PDI-CC14B-4.5-5.0	JC27804-20A	2-METHYLNAPHTHALENE	U	54.9J	54.9	77	Qualify	2
NFS-PDI-CC14B-4.5-5.0	JC27804-20A	3+4-METHYLPHENOL	U	699	699	77		

Field Sample ID	Lab Sample ID	Analyte	Method Blank (ug/kg)	Laboratory Sample Result (ug/kg)	Validation Sample Result (ug/kg)	RL (ug/kg)	Quality Assurance Decision	NJDEP Validation Footnote
NFS-PDI-CC14B-4.5-5.0	JC27804-20A	ACENAPHTHENE	U	75.8	75.8	39		
NFS-PDI-CC14B-4.5-5.0	JC27804-20A	ANTHRACENE	U	89.0	89.0	39		
NFS-PDI-CC14B-4.5-5.0	JC27804-20A	BENZALDEHYDE	U	57.2J	57.2	190	Qualify	2
NFS-PDI-CC14B-4.5-5.0	JC27804-20A	BENZO(A)ANTHRACENE	U	160	160	39		
NFS-PDI-CC14B-4.5-5.0	JC27804-20A	BENZO(A)PYRENE	U	164	164	39		
NFS-PDI-CC14B-4.5-5.0	JC27804-20A	BENZO(B)FLUORANTHENE	U	220	220	39		
NFS-PDI-CC14B-4.5-5.0	JC27804-20A	BENZO(G,H,I)PERYLENE	U	108	108	39		
NFS-PDI-CC14B-4.5-5.0	JC27804-20A	BENZO(K)FLUORANTHENE	U	66.9	66.9	39		
NFS-PDI-CC14B-4.5-5.0	JC27804-20A	CARBAZOLE	U	51.1J	51.1	77	Qualify	2
NFS-PDI-CC14B-4.5-5.0	JC27804-20A	CHRYSENE	U	195	195	39		
NFS-PDI-CC14B-4.5-5.0	JC27804-20A	DIBENZO(A,H)ANTHRACENE	U	25.1J	25.1	39	Qualify	2
NFS-PDI-CC14B-4.5-5.0	JC27804-20A	DIBENZOFURAN	U	64.9J	64.9	77	Qualify	2
NFS-PDI-CC14B-4.5-5.0	JC27804-20A	FLUORANTHENE	U	288	288	39		
NFS-PDI-CC14B-4.5-5.0	JC27804-20A	FLUORENE	U	72.4	72.4	39		
NFS-PDI-CC14B-4.5-5.0	JC27804-20A	INDENO(1,2,3-CD)PYRENE	U	115	115	39		
NFS-PDI-CC14B-4.5-5.0	JC27804-20A	NAPHTHALENE	U	131	131	39		
NFS-PDI-CC14B-4.5-5.0	JC27804-20A	PHENANTHRENE	U	235	235	39		
NFS-PDI-CC14B-4.5-5.0	JC27804-20A	PYRENE	U	419	419	39		
NFS-PDI-CC14B-6.5-7.0	JC27804-21A	2-METHYLNAPHTHALENE	U	17.9J	17.9	86	Qualify	2
NFS-PDI-CC14B-6.5-7.0	JC27804-21A	3+4-METHYLPHENOL	U	230	230	86		
NFS-PDI-CC14B-6.5-7.0	JC27804-21A	ACENAPHTHENE	U	25.2J	25.2	43	Qualify	2
NFS-PDI-CC14B-6.5-7.0	JC27804-21A	ANTHRACENE	U	52.1	52.1	43		
NFS-PDI-CC14B-6.5-7.0	JC27804-21A	BENZALDEHYDE	U	28.5J	28.5	210	Qualify	2
NFS-PDI-CC14B-6.5-7.0	JC27804-21A	BENZO(A)ANTHRACENE	U	97.5	97.5	43		

Field Sample ID	Lab Sample ID	Analyte	Method Blank (ug/kg)	Laboratory Sample Result (ug/kg)	Validation Sample Result (ug/kg)	RL (ug/kg)	Quality Assurance Decision	NJDEP Validation Footnote
NFS-PDI-CC14B-6.5-7.0	JC27804-21A	BENZO(A)PYRENE	U	111	111	43		
NFS-PDI-CC14B-6.5-7.0	JC27804-21A	BENZO(B)FLUORANTHENE	U	128	128	43		
NFS-PDI-CC14B-6.5-7.0	JC27804-21A	BENZO(G,H,I)PERYLENE	U	69.5	69.5	43		
NFS-PDI-CC14B-6.5-7.0	JC27804-21A	BENZO(K)FLUORANTHENE	U	54.0	54.0	43		
NFS-PDI-CC14B-6.5-7.0	JC27804-21A	CHRYSENE	U	116	116	43		
NFS-PDI-CC14B-6.5-7.0	JC27804-21A	DIBENZO(A,H)ANTHRACENE	U	23.0J	23.0	43	Qualify	2
NFS-PDI-CC14B-6.5-7.0	JC27804-21A	DIBENZOFURAN	U	24.4J	24.4	86	Qualify	2
NFS-PDI-CC14B-6.5-7.0	JC27804-21A	FLUORANTHENE	U	155	155	43		
NFS-PDI-CC14B-6.5-7.0	JC27804-21A	FLUORENE	U	26.8J	26.8	43	Qualify	2
NFS-PDI-CC14B-6.5-7.0	JC27804-21A	INDENO(1,2,3-CD)PYRENE	U	85.0	85.0	43		
NFS-PDI-CC14B-6.5-7.0	JC27804-21A	NAPHTHALENE	U	49.8	49.8	43		
NFS-PDI-CC14B-6.5-7.0	JC27804-21A	PHENANTHRENE	U	182	182	43		
NFS-PDI-CC14B-6.5-7.0	JC27804-21A	PYRENE	U	242	242	43		

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

NJDEP Laboratory Footnote

1. The reported value was qualified because the LCS recovery was above the upper control limit.
2. The reported result was greater than the MDL but less than the RL and therefore was estimated.

Aqueous Target Analyte Summary Hit List (SVOCs)

Site Name PPG - North Forest Street PDI
Sampling Date September 16, 2016
Lab Name/ID SGS/Accutest, Dayton, NJ
SDG No JC27804A
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID NFS-PDI-FB20160916

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
NFS-PDI-FB20160916	JC27804-1A	BIS(2-ETHYLHEXYL)PHTHALATE	U	2.8	2.8	2.0		

Note: A "U" under Method Blank column indicates a nondetect result.
 A "U" under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

Attachment B

Data Validation Report Form

Client Name: PPG Industries		Project Number: 60314351.GA.DE.PDI.NFS			
Site Location: PPG - North Forest Street PDI, Jersey City, NJ		Project Manager: Aimee Ruitter			
Laboratory: SGS/Accutest, Dayton, NJ		Type of Validation: Limited			
Laboratory Job No: JC27804A		Date Checked: 11/03/2016			
Validator: Charlene Livingston Flint		Peer: Kristin Rutherford			
ITEM	YES	NO	N/A	COMMENTS	
Sample results included?	X				
Reporting Limits met project requirements?	X				
Field I.D. included?	X				
Laboratory I.D. included?	X				
Did data package sample IDs match sample IDs on COC?	X				
Did electronic data deliverable (EDD) sample IDs match COC sample IDs?	X				
Did data package sample IDs match electronic data deliverable (EDD) sample IDs?	X				
Sample matrix included?	X				
Sample receipt temperature 2-6°C?	X			4.9° C	
Signed COCs included?	X				
Date of sample collection included?	X				
Date of sample digestion included?	X				
Date of analysis included?	X				
Holding time met QC criteria? (Metals -180 days from sample collection; Mercury - 28 days from sample collection. If HT exceeded by 10 days R all results.	X				
Method reference included?	X				
Laboratory Case Narrative included?	X				
Definitions: MDL - Method Detection Limit; %R - Percent Recovery; RL - Reporting Limit; RPD - Relative Percent Difference; RSD - Relative Standard Deviation :Corr - Correlation Coefficient.					

ITEM	YES	NO	N/A	COMMENTS
Sample dilutions?	X			see table below
Initial calibration documentation included in lab package?			X	N/A for Limited Validation
1) Calibrate daily or each time instrument is set up.			X	
2) ICP (6010) -Blank plus 1 standard?			X	
3) Hg (7470/7471) -Blank plus 5 standards?			X	
Initial Calibration Verification Standard (ICV) for ICP (6010) and Initial Calibration Check Standard (ICCS) for Hg (7470/7471) included in lab package?			X	N/A for Limited Validation
1) Analyzed immediately after initial calibration?			X	
2) %R criteria met? (90-110%)			X	
3) Spot check ICV/ICCS results for several analytes.			X	
Continuing Calibration Verification Standard (CCV) for ICP (6010) and Calibration Check Standard (CCS) for Hg (7470/7471) included in Lab Package?			X	N/A for Limited Validation
1) Analyzed immediately after each ICV/ICC/CB and after every 10 samples?			X	
2) CCS and CCV from independent source and at mid- level of calibration curve.			X	
3) %R criteria met? (90-110%R).			X	
4) Spot check CCV/CCS results for several analytes.			X	
Low Calibration Standard (CRI) included in Lab Package?			X	N/A for Limited Validation
1) %R criteria met?			X	
Calibration Blanks			X	N/A for Limited Validation
1) Analyzed after daily calibration and after each ICV/ICC/CCV/CCS and after every 10 samples?			X	
2) Absolute value <3xIDL?			X	
Method Blank Included in Lab Package?	X			
1) Method blank analyzed with each preparation batch or every SDG, or 1/20 samples?	X			
2) Method blank analyzed 1/20 samples	X			
3) MB results nondetect?		X		see table below
4) Negative MB result reported?		X		
Field Blanks/Equipment Blanks Included in Lab Package?	X			NFS-PDI-FB20160916

ITEM	YES	NO	N/A	COMMENTS
1) FB/EB result non-detect?		X		see table below
ICP Interference Check Sample (ICS) included in Lab Package?			X	N/A for Limited Validation
1) Analyzed at beginning of analytical run?			X	
2) %R criteria met? (80-120%)			X	
3) Spot check accuracy of %Rs			X	
Matrix Spike/Matrix Spike Duplicate Data Included in Lab Package?	X			JC27804-23A
1) MS/MSD %R (75-125%R) and RPD (20%) criteria met?		X		see table below
2) Was a sample spiked at the frequency of 1/batch or 20 samples?	X			
3) Was the MS performed on a site sample?	X			
4) Was the MS performed on a FB/EB or TB?		X		
Post Digestion Spike			X	N/A for Limited Validation
1) %R criteria met? (75-125%R)			X	
2) Was the spike performed on a FB/EB or TB?			X	
3) Was a sample spiked at the frequency of 1/batch or 20 samples?			X	
Laboratory Duplicate Data Included in Lab Package?		X		
Aqueous - RPD criteria met? (20%)			X	
Soil - RPD criteria met? (35%)			X	
Was a Laboratory Control Sample (LCS) Included in Lab Package?	X			
1) LCS %R criteria met? (80-120%R).	X			
2) Was an LCS analyzed at the frequency of 1/batch or 20 samples?	X			
Serial Dilution			X	N/A for Limited Validation
1) %D (<10%R) criteria met? -			X	
2) Was the frequency 1/batch or 20 samples?			X	
3) Was a site sample used?			X	
4) Was a FB/EB or TB used?			X	
5) Spot check accuracy of %Ds.			X	

ITEM	YES	NO	N/A	COMMENTS
Field Duplicate Data included in Lab Package?		X		
Aqueous - RPD criteria met? (20%)			X	
Soil - RPD criteria met? (35%)			X	
Percent Solids data included in Lab Package?	X			
1) % Solids criteria (Reg 2 criteria) met? (\geq 50%)	X			
Chromium result greater than corresponding hexavalent chromium result where applicable?	X			Hexavalent chromium reported in JC27804,R,T

Blanks

Analyte	Result	3X	10X	Actions	Associated Samples
Soil Method Blank MP96054	(mg/kg)	(mg/kg)	(mg/kg)		
Aluminum	6.7	20.1	67.0	OK, >10X MB	All soil samples except for JC27804-23A
Calcium	19.3	57.9	193	OK, >10X MB	All soil samples except for JC27804-23A
Iron	1.9	5.7	19.0	OK, >10X MB	All soil samples except for JC27804-23A
Manganese	0.038	0.114	0.38	OK, >10X MB	All soil samples except for JC27804-23A
Nickel	0.076	0.228	0.76	OK, >10X MB	All soil samples except for JC27804-23A
Zinc	1.0	3.0	10.0	OK, >10X MB	All soil samples except for JC27804-23A
Soil Method Blank MP96126	(mg/kg)	(mg/kg)	(mg/kg)		
Aluminum	3.7	11.1	37.0	OK, >10X MB	JC27804-23A
Barium	0.14	0.42	1.4	OK, >10X MB	JC27804-23A
Calcium	19.0	57.0	190	OK, >10X MB	JC27804-23A
Copper	7.0	21.0	70.0	<3x MB, Negate (UB) at RL	JC27804-23A
Iron	20.8	62.4	208	OK, >10X MB	JC27804-23A
Manganese	0.24	0.72	2.4	OK, >10X MB	JC27804-23A
Nickel	0.21	0.63	2.1	OK, >10X MB	JC27804-23A
Sodium	8.9	26.7	89.0	OK, >10X MB	JC27804-23A
Zinc	0.42	1.26	4.2	OK, >10X MB	JC27804-23A

Analyte	Result	3X	10X	Actions	Associated Samples
Aqueous Method Blank MP96078	(ug/l)	(ug/l)	(ug/l)		
Zinc	8.6	25.8	86.0	<3X MB, Negate (UB) at RL	NFS-PDI-FB20160916

Analyte	Result	Converted result	3X	10X	Actions	Associated Samples
Equipment Blank	(ug/l)	(mg/kg)*	(mg/kg)	(mg/kg)		
Mercury	0.097	0.0097	0.029	0.097	<3X EB, Negate (U)	JC27804-17A, -18A, -23A, -24A
Mercury	0.097	0.0097	0.029	0.097	>3X but <10X EB Estimate (J)	JC27804-21A, -22A
Mercury	0.097	0.0097	0.029	0.097	OK, >10X EB	JC27804-19A, -20A
Sodium	54.7	5.47	16.4	54.7	OK, >10X EB	All soil samples
Nickel	1.4	0.14	0.42	1.4	OK, >10X EB	All soil samples
Manganese	0.40	0.040	0.12	0.40	OK, >10X EB	All soil samples

*Note: A nominal weight of 1g and nominal final volume of 0.10L was used to convert aqueous units (ug/L) to soils units (mg/kg) in the absence of a full data deliverable.

Matrix Spikes

Sample ID	Lab ID	Analyte	MS % R	MSD % R	Lower Limit	Upper Limit	RPD	RPD Limit	Actions
NFS-PDI-CC14B-8.0-8.5	JC27804-23A	Aluminum	151.9	141.1	75	125	1.9	20	SR >4x spike amt. Accept
NFS-PDI-CC14B-8.0-8.5	JC27804-23A	Antimony	64.6	64.7	75	125	0.8	20	Estimate (J) result in parent sample
NFS-PDI-CC14B-8.0-8.5	JC27804-23A	Iron	-12.0	-60.5	75	125	5.9	20	SR >4x spike amt. Accept

Percent Solids

Sample ID	Percent Solids (%)	Status
NFS-PDI-CC14B-0.5-1.0	95	ok @50%
NFS-PDI-CC14B-10.5-11.0	86	ok @50%
NFS-PDI-CC14B-2.5-3.0	82.1	ok @50%
NFS-PDI-CC14B-4.5-5.0	81.9	ok @50%
NFS-PDI-CC14B-6.5-7.0	76.9	ok @50%
NFS-PDI-CC14B-7.5-8.0	85.1	ok @50%
NFS-PDI-CC14B-8.0-8.5	86.9	ok @50%
NFS-PDI-CC14B-8.5-9.0	82.8	ok @50%

Sample Dilutions

Sample	Lab ID	Dilution	Analyte
NFS-PDI-CC14B-2.5-3.0	JC27804-19A	2	LEAD
		2	MANGANESE
		2	SILVER
		2	THALLIUM
		2	COPPER
		2	SELENIUM
		2	IRON

Client Name: PPG Industries		Project Number: 60314351.GA.DE.PDI.NFS		
Site Location: PPG - North Forest Street PDI, Jersey City, NJ		Project Manager: Aimee Ruiter		
Laboratory: SGS/Accutest, Dayton, NJ		Type of Validation: Limited		
Laboratory Job No: JC27804A		Date Checked: 11/03/2016		
Validator: Charlene Livingston Flint		Peer: Kristin Rutherford		
ITEM	YES	NO	N/A	COMMENTS
Sample results included?	X			
Reporting Limits met project requirements?	X			
Field I.D. included?	X			
Laboratory I.D. included?	X			
Did data package sample IDs match sample IDs on COC?	X			
Did electronic data deliverable (EDD) sample IDs match COC sample IDs?	X			
Did data package sample IDs match electronic data deliverable (EDD) sample IDs?	X			
Sample matrix included?	X			
Sample receipt temperature 2-6°C?	X			4.9° C
Signed COCs included?	X			
Date of sample collection included?	X			
Date of analysis included?	X			
Holding time met QC criteria? (Metals -180 days from sample collection; Mercury - 28 days from sample collection. If HT exceeded by 10 days R all results.	X			
Method reference included?	X			
Laboratory Case Narrative included?	X			
Definitions: MDL - Method Detection Limit; %R - Percent Recovery; RL - Reporting Limit; RPD - Relative Percent Difference; RSD - Relative Standard Deviation :Corr - Correlation Coefficient.				

ITEM	YES	NO	N/A	COMMENTS
Sample dilutions?		X		No dilutions
Method Blank Included in Lab Package?	X			
1) Method blank analyzed with each preparation batch?	X			
2) Absolute value should not exceed RL.	X			
Trip Blanks/Field Blanks/Equipment Blanks Included in Lab Package?	X			NFS-PDI-FB20160916
1) TB/FB/EB results non-detect?	X			
Surrogate Data Included?	X			
1) Is %R criteria (laboratory criteria) met?	X			
Matrix Spike/Matrix Spike Duplicate Data Included in Lab Package?	X			MS analyzed JC27804-23A
1) %R and RPD (laboratory criteria) met?	X			
2) Was the spike concentration at the same concentration as the LCS?	X			
3) Was a sample spiked at the frequency of 1 per 20 samples?	X			
Was a Laboratory Control Sample (LCS) Included in Lab Package?	X			
1) LCS %R criteria met? (laboratory criteria)	X			
2) Was an LCS analyzed at the frequency of 1/batch or 20 samples?	X			
Field Duplicate Data included in Lab Package?		X		
1) %RPD criteria (Reg 2 criteria) met?			X	
Percent Solids data included in Lab Package?	X			
1) %Solids criteria (Reg 2 criteria) met? (>/=50%)	X			

Percent Solids

Sample ID	Percent Solids (%)	Status
NFS-PDI-CC14B-0.5-1.0	95	ok @50%
NFS-PDI-CC14B-10.5-11.0	86	ok @50%
NFS-PDI-CC14B-2.5-3.0	82.1	ok @50%
NFS-PDI-CC14B-4.5-5.0	81.9	ok @50%
NFS-PDI-CC14B-6.5-7.0	76.9	ok @50%
NFS-PDI-CC14B-7.5-8.0	85.1	ok @50%
NFS-PDI-CC14B-8.0-8.5	86.9	ok @50%
NFS-PDI-CC14B-8.5-9.0	82.8	ok @50%

Client Name: PPG Industries		Project Number: 60314351.GA.DE.PDI.NFS		
Site Location: PPG - North Forest Street PDI, Jersey City, NJ		Project Manager: Aimee Ruitter		
Laboratory: SGS/Accutest, Dayton, NJ		Type of Validation: Limited		
Laboratory Job No: JC27804A		Date Checked: 11/03/2016		
Validator: Charlene Livingston Flint		Peer: Kristin Rutherford		
ITEM	YES	NO	N/A	COMMENTS
Sample results included?	X			
Reporting Limits met project requirements?		X		See nonconformance tables
Field I.D. included?	X			
Laboratory I.D. included?	X			
Did data package sample IDs match sample IDs on COC?	X			
Did electronic data deliverable (EDD) sample IDs match COC sample IDs?	X			
Did data package sample IDs match electronic data deliverable (EDD) sample IDs?	X			
Sample matrix included?	X			
Sample receipt temperature 2-6°C?	X			4.9° C
Signed COCs included?	X			
Date of sample collection included?	X			
Date of sample extraction included?	X			
Date of analysis included?	X			
Holding time to analysis met criteria?	X			
Method reference included?	X			
Laboratory Case Narrative included?	X			
Definitions: MDL - Method Detection Limit; %R - Percent Recovery; RL - Reporting Limit; RPD - Relative Percent Difference; RSD - Relative Standard Deviation :Corr - Correlation Coefficient.				

ITEM	YES	NO	N/A	COMMENTS
Sample dilutions?	X			JC27804-19A dil 2x
Method Blank Included in Lab Package?	X			
1) Method blank analyzed with each preparation batch?	X			
2) Absolute value should not exceed RL.	X			
Trip Blanks/Field Blanks/Equipment Blanks Included in Lab Package?	X			NFS-PDI-FB20160916
1) TB/FB/EB results non-detect?		X		Bis (2-ethylhexyl) phthalate reported in EB
Surrogate Data Included?	X			
1) Is %R criteria (laboratory criteria) met?	X			JC27804-17A 2-Fluorobiphenyl %R high, others ok. No qualifications.
Matrix Spike/Matrix Spike Duplicate Data Included in Lab Package?	X			JC27804-23A
1) %R and RPD (laboratory criteria) met?	X			
2) Was the spike concentration at the same concentration as the LCS?		X		Soil LCS @ 1670 ug/kg; MS at 1820 ug/kg. No impact to data.
3) Was a sample spiked at the frequency of 1 per 20 samples?	X			
Was a Laboratory Control Sample (LCS) Included in Lab Package?	X			
1) LCS %R criteria met? (laboratory criteria)		X		See table below.
2) Was an LCS analyzed at the frequency of 1/batch or 20 samples?	X			
Field Duplicate Data included in Lab Package?		X		
1) %RPD criteria (Reg 2 criteria) met?			X	
Percent Solids data included in Lab Package?	X			
1) %Solids criteria (Reg 2 criteria) met? (>=50%)	X			

Equipment Blank

Analyte	Result	RL	Actions	Associated Samples
NFS-PDI-FB20160916	(µg/L)	(µg/L)	(µg/L)	
BIS(2-ETHYLHEXYL)PHTHALATE	2.8	2.0	None, result ND or >10x EB	All soil samples

Surrogates

Sample ID	Lab ID	Surrogate	%Recovery	Recovery Limits	Actions
NFS-PDI-CC14B-0.5-1.0	JC27804-17A	2-Fluorobiphenyl	125	36-112	None, 5 other surrogates within QC limits

LCS

Compound	MS % R	Lower Limit	Upper Limit	Actions	Associated Samples
ACENAPHTYLENE	95	54	94	Estimate (J) positive result in sample JC27804-19A. No qualifications for other associated ND results.	all soils <i>except</i> JC27804-17A and -23A
BIS(2-CHLOROETHOXY)METHANE	107	51	106	Result ND, no qual	all soils <i>except</i> JC27804-17A and -23A
BIS(2-CHLOROETHYL)ETHER	115	48	107	Result ND, no qual	all soils <i>except</i> JC27804-17A and -23A

Percent Solids

Sample ID	Percent Solids (%)	Status
NFS-PDI-CC14B-0.5-1.0	95	ok @50%
NFS-PDI-CC14B-10.5-11.0	86	ok @50%
NFS-PDI-CC14B-2.5-3.0	82.1	ok @50%
NFS-PDI-CC14B-4.5-5.0	81.9	ok @50%
NFS-PDI-CC14B-6.5-7.0	76.9	ok @50%
NFS-PDI-CC14B-7.5-8.0	85.1	ok @50%
NFS-PDI-CC14B-8.0-8.5	86.9	ok @50%
NFS-PDI-CC14B-8.5-9.0	82.8	ok @50%

Sample Dilutions

Sample	Lab ID	Dilution
NFS-PDI-CC14B-2.5-3.0	JC27804-19A	2X

SVOC Reporting Limits

Sample ID	Lab ID	Analyte	Result	Detect Flag	Units	DIGWSSL Action Level
NFS-PDI-CC14B-0.5-1.0	JC27804-17A	2,4-DINITROPHENOL	650	N	ug/kg	300

Data Validation Report

Project:	PPG - North Forest Street PDI	
Laboratory:	SGS Accutest, Dayton, NJ	
Laboratory Job No.:	JC27917	
Analysis/Method:	Hexavalent Chromium SW846 3060A/7196	
Validation Level:	Full	
Site Location/Address:	70 Carteret Avenue, Jersey City, NJ	
AECOM Project No:	60314351.GA.DE.PDI.NFS	
Prepared by:	Dawn Brule /AECOM	Completed on: 10/19/2016
Reviewed by:	Mary Kozik/AECOM	File Name: JC27917_2016-10-19_DV Report-F

Introduction

The data were reviewed in accordance with the FSP-QAPP and the following NJDEP validation Standard Operating Procedure (SOP):

- NJDEP Office of Data Quality SOP 5.A.10, Rev 3 (September 2009), SOP for Analytical Data Validation of Hexavalent Chromium - for USEPA SW-846 Method 3060A, and USEPA SW-846 Method 7196A;

The results of quality control data analyzed with site samples were used to assess the overall reliability of the data. The following qualifiers were used to identify data quality issues:

- U: Indicates the analyte was not detected in the sample above the sample reporting limit.
- J: Indicates the result was an estimated value; the associated numerical value was an approximate concentration of the analyte in the sample.
- UJ: Indicates the analyte was not detected above the reporting limit and the reporting limit was approximate.
- UB: The analyte concentration is less than or equal to three (3) times the concentration in the associated method/prep blank. The presence of the analyte in the sample is negated (UB) due to laboratory contamination.
- JB: The analyte concentration is greater than three (3) times, but less than or equal to ten (10) times the concentration in the associated method/prep blank. The presence of that analyte in the sample is considered "real". The concentration is quantitatively qualified (JB) due to method blank contamination.
- R: The sample result was rejected due to serious deficiencies; the presence or absence of the analyte could not be confirmed.
- RA: The sample result was rejected but is still considered usable.

Sample Information

The samples listed below were collected by AECOM on September 19, 2016 as part of the PPG - North Forest Street PDI sampling at 70 Carteret Avenue, Jersey City, NJ. Only the samples and parameters listed below were validated.

Field ID	Laboratory ID	Matrix	Fraction
NFS-FB20160919 (Equipment Blank)	JC27917-1	Aqueous	Hexavalent Chromium
NFS-PDI-AA14B-0.5-1.0	JC27917-2	Soil	Hexavalent Chromium
NFS-PDI-AA14B-10.5-11.0	JC27917-3	Soil	Hexavalent Chromium
NFS-PDI-AA14B-12.5-13.0	JC27917-4	Soil	Hexavalent Chromium
NFS-PDI-AA14B-14.5-15.0	JC27917-5	Soil	Hexavalent Chromium
NFS-PDI-AA14B-16.5-17.0	JC27917-6	Soil	Hexavalent Chromium
NFS-PDI-AA14B-18.5-19.0	JC27917-7	Soil	Hexavalent Chromium
NFS-PDI-AA14B-2.5-3.0	JC27917-8	Soil	Hexavalent Chromium
NFS-PDI-AA14B-2.5-3.0X (Field Duplicate of NFS-PDI-AA14B-2.5-3.0)	JC27917-9	Soil	Hexavalent Chromium
NFS-PDI-AA14B-20.0-20.5	JC27917-10	Soil	Hexavalent Chromium
NFS-PDI-AA14B-4.5-5.0	JC27917-11	Soil	Hexavalent Chromium
NFS-PDI-AA14B-6.5-7.0	JC27917-12	Soil	Hexavalent Chromium
NFS-PDI-AA14B-8.5-9.0	JC27917-13	Soil	Hexavalent Chromium
NFS-PDI-AA14B-9.0-9.5	JC27917-14	Soil	Hexavalent Chromium

The samples were collected following the procedures detailed in the Work Order for Garfield Avenue Remedial Action (GARA) at 70 Carteret Avenue, Jersey City, NJ and the Field Sampling Plan/Quality Assurance Project Plan for Non-Residential and Residential Chromium Sites Hudson County, New Jersey (December 2011).

General Comments

The data package was complete. Quality control (QC) issues identified during validation are discussed below. Refer to the Target Analyte Summary Hit(s) in Attachment A for a listing of all detected results, qualified results, and associated qualifications, where applicable. The nonconformances for each section discussed below are presented in Attachment B.

MS Results

Sample NFS-PDI-AA14B-10.5-11.0 was selected for the matrix spike (MS) analysis associated with the samples in this SDG and was used for supporting data quality recommendations. The soluble and insoluble MS recoveries were 76.8% and 85.2%, respectively; which met the quality control criteria of 75-125%. The post digestion spike (PDS) recovery was 97%, which met the PDS criteria of 85-115%. No data qualification was required on the basis of spike recoveries.

Field Duplicate Results

The field duplicate pair in this SDG was DI-AA14B-2.5-3.0 and NFS-PDI-AA14B-2.5-3.0X.

The relative percent difference for the reported hexavalent chromium field duplicate results exceeded the QC acceptance RPD; therefore, the reported hexavalent chromium results in all the soil samples in this SDG were qualified as estimated (J/UJ).

Sample Results

Reported results (flagged B by the laboratory) that were less than the reporting limit (RL), but greater than or equal to the method detection limit (MDL) are approximate values and have been qualified as estimated (J).

Data Quality and Usability

In general, these data appear to be valid and may be used for decision-making purposes. No data were rejected. Qualified results, if applicable, are presented in Attachments A and B.

Sample results qualified due to poor field duplicate precision are usable as estimated values with an unknown directional bias.

In addition, sample results reported between the MDL and RL are usable as estimated values with an unknown directional bias.

ATTACHMENTS

Attachment A: Target Analyte Summary Hit List(s)

Attachment B: Data Validation Report Form

Attachment A

Target Analyte Summary Hit List(s)

Soil Target Analyte Summary Hit List (Hexavalent Chromium)

Site Name PPG - North Forest Street PDI
Sampling Date September 19, 2016
Lab Name/ID Accutest, Dayton, NJ
SDG No JC27917
Sample Matrix Soil
Trip Blank ID NA
Field Blank ID NFS-FB20160919

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
NFS-PDI-AA14B-0.5-1.0	JC27917-2	CHROMIUM (HEXAVALENT)	U	1.8	1.8	0.47	Qualify	1
NFS-PDI-AA14B-10.5-11.0	JC27917-3	CHROMIUM (HEXAVALENT)	U	1.3	1.3	0.47	Qualify	1
NFS-PDI-AA14B-12.5-13.0	JC27917-4	CHROMIUM (HEXAVALENT)	U	U	U	0.52	Qualify	1
NFS-PDI-AA14B-14.5-15.0	JC27917-5	CHROMIUM (HEXAVALENT)	U	1.5	1.5	0.47	Qualify	1
NFS-PDI-AA14B-16.5-17.0	JC27917-6	CHROMIUM (HEXAVALENT)	U	0.33B	0.33	0.47	Qualify	1,2
NFS-PDI-AA14B-18.5-19.0	JC27917-7	CHROMIUM (HEXAVALENT)	U	1.3	1.3	0.47	Qualify	1
NFS-PDI-AA14B-2.5-3.0	JC27917-8	CHROMIUM (HEXAVALENT)	U	37.4	37.4	0.48	Qualify	1
NFS-PDI-AA14B-2.5-3.0X	JC27917-9	CHROMIUM (HEXAVALENT)	U	23.0	23.0	0.50	Qualify	1
NFS-PDI-AA14B-20.0-20.5	JC27917-10	CHROMIUM (HEXAVALENT)	U	1.1	1.1	0.49	Qualify	1
NFS-PDI-AA14B-4.5-5.0	JC27917-11	CHROMIUM (HEXAVALENT)	U	U	U	0.48	Qualify	1
NFS-PDI-AA14B-6.5-7.0	JC27917-12	CHROMIUM (HEXAVALENT)	U	0.84	0.84	0.51	Qualify	1
NFS-PDI-AA14B-8.5-9.0	JC27917-13	CHROMIUM (HEXAVALENT)	U	0.75	0.75	0.48	Qualify	1
NFS-PDI-AA14B-9.0-9.5	JC27917-14	CHROMIUM (HEXAVALENT)	U	0.32B	0.32	0.46	Qualify	1,2

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

NJDEP Laboratory Footnote

1. In the Field Duplicate Analysis, Hexavalent Chromium fell outside the control limits of ≤ 20 percent for sample results $> 4xRL$ or $+ RL$ for sample results $< 4xRL$. Therefore, the result was qualified (J/UJ).
2. The reported result was greater than the MDL but less than the RL and qualified (J) as estimated by the laboratory.

Attachment B

Data Validation Report Form

Client Name: PPG Industries	Project Number: 60314351.GA.DE.PDI.NFS
Site Location: PPG - North Forest Street PDI, Jersey City, NJ	Project Manager: Aimee Ruiter
Laboratory: Accutest, Dayton, NJ	Type of Validation: Full
Laboratory Job No: JC27917	Date Checked: 10/19/2016
Validator: Dawn Brule	Peer: Mary Kozik

ITEM	YES	NO	N/A	COMMENTS
Sample results included?	X			
Reporting Limits met project requirements?	X			
Field I.D. included?	X			
Laboratory I.D. included?	X			
Did data package sample IDs match sample IDs on COC?	X			
Did electronic data deliverable (EDD) sample IDs match COC sample IDs?	X			
Did data package sample IDs match electronic data deliverable (EDD) sample IDs?	X			
Sample matrix included?	X			
Sample receipt temperature 2-6°C?	X			2.7°C
Signed COCs included?	X			
Date of sample collection included?	X			
Date of sample digestion included?	X			
Holding time to digestion met criteria? (Soils -30 days from collection to digestion.)	X			
Date of analysis included?	X			
Holding time to analysis met criteria? (Soils -168 hours from digestion to analysis; Aqueous - 24 hours from collection to analysis.)	X			
Method reference included?	X			
Laboratory Case Narrative included?	X			

Definitions: MDL - Method Detection Limit; %R - Percent Recovery; RL - Reporting Limit; RPD - Relative Percent Difference; RSD - Relative Standard Deviation ;Corr - Correlation Coefficient.

ITEM	YES	NO	N/A	COMMENTS
Initial calibration documentation included in lab package?	X			
1) Blank plus 4 standards (7196A) or blank plus 3 standards (7199)	X			
2) Correlation coefficient of =0.995 (7196A) or =0.999 (7199)	X			
3) Calibrate daily or each time instrument is set up.	X			
Calibration Check Standard (CCS) for 7196A and Quality Control Sample (QCS) for 7199 Included in Lab Package?	X			
1) %R criteria met? (90 - 110%)	X			
2) Correct frequency of one per every 10 samples	X			
3) CCS and QCS from independent source and at mid-level of calibration curve	X			
Calibration Blanks	X			
1) Analyzed prior to initial calibration standards and after each CCS/QCS?	X			
2) Absolute value should not exceed MDL.	X			
Method Blank, Field Blanks and/or Equipment Blanks Included in Lab Package?	X			
1) Method blank analyzed with each preparation batch?	X			
2) Absolute value should not exceed MDL.		X		AQ MB >MDL but < RL; FB ND so no qual
Eh and pH Data	X			
1) Eh and pH data was included and plotted for all samples?	X			
Soluble Matrix Spike Data Included in Lab Package?	X			
1) Soluble Matrix %R criteria met? (75-125%R).	X			
2) Was the spike concentration 40 mg/Kg or twice the sample concentration?		X		48.3mg/kg; no impact to data.
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	X			
Insoluble Matrix Spike Data Included in Lab Package?	X			
1) Insoluble Matrix %R criteria met? (75-125%R).	X			
2) Was the spike concentration around 400 to 800 mg/Kg?		X		1490 mg/kg; no impact to data.
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	X			

ITEM	YES	NO	N/A	COMMENTS
Post Digestion Spike	X			
1) Post Digestion Spike %R criteria met? (85-115%R).	X			
2) Was the spike concentration 40 mg/Kg or twice the sample concentration?	X			
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	X			
Sample Duplicate Data Included in Lab Package?	X			
1) RPD criteria met? (RPD \leq 20%) if both results are $>4x$ RL or absolute difference \leq RL if either or both results are $<4x$ RL.	X			
2) Was a sample duplicate analyzed at the frequency of 1 per batch or 20 samples?	X			
Was a Laboratory Control Sample (LCS) Included in Lab Package?	X			
1) %R criteria met? (80-120%R).	X			
2) Was an LCS analyzed at the frequency of 1/batch or 20 samples?	X			
Were any Field Duplicate samples submitted with this SDG?	X			
1) RPD criteria met? (RPD \leq 20%) if both results are $>4x$ RL or absolute difference \leq RL if either or both results are $<4x$ RL.		X		See table below.
Were all sample quantitation and reporting requirements met?	X			
1) Were all solid samples reported with percent solids $> 50\%$?	X			
2) Were any samples analyzed or reported with dilutions?	X			
Miscellaneous Items				
1) For soils by 7196A, was the pH within a range of 7.0-8.0?	X			
2) For soils by 7199, was the pH within a range of 9.0-9.5?			X	
3) For aqueous by 7196A, was the pH with a range of 1.5-2.5?	X			
4) For soils (3060A), was the digestion temperature 90-95C for at least 60 minutes?	X			
5) For 7199, was each sample injected twice and was the RPD $<20\%$?			X	

Field Duplicates

Sample ID	Duplicate ID	Analyte	Sample Result	Qual	Duplicate Result	Qual	QL	Units	RPD
NFS-PDI-AA14B-2.5-3.0	NFS-PDI-AA14B-2.5-3.0X	CHROMIUM (HEXAVALENT)	37.4		23		0.48	mg/kg	47.7

SDG#: JC27917/ Method 7196

Batch: GN52664

Cr+6 ICAL 09/28/16

Soil

(p. 61 of data pkg)

x - concentration	y - response
0	0
0.01	0.009
0.05	0.043
0.1	0.081
0.3	0.227
0.5	0.393
0.8	0.618
1	0.800

(p. 61 of data pkg)

AECOM Calculated Offset	-0.0007	OK	Reported Offset	-0.0007
AECOM Slope	0.7885	OK, rounding	Reported Slope	0.7887
AECOM Calculated r	0.99969	OK, rounding	Reported r	0.99968

LCS calculation

GP344-B1 P. 38,61

Background Absorbance	0
Total absorbance	0.715
Total absorbance - background	0.715
Instrument Concentration	0.908
Sample weight (mg/kg)	0.0025
Final Volume (L)	0.1
Dilution Factor	1

AECOM Calculated LCS Result (mg/Kg)	36.3	OK	Reported Result (mg/Kg)	36.3
-------------------------------------	------	----	-------------------------	------

%R = Found/True*100

GP344-B1 P. 38,61

True Value (mg/kg)	40
--------------------	----

AECOM Calculated %R	90.8	OK	Reported %R	90.8
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MS calculation

GP344-S1 P. 40,41,61 JC27917-3

Background reading	0
Total absorbance	0.626
Total absorbance - background	0.626
Instrument Concentration	0.7948
Sample weight (mg/kg)	0.00245
Final Volume (L)	0.1
Percent solids	0.845
Dilution Factor	1

AECOM Calculated MS Result (mg/Kg)	38.4	OK	Reported Result (mg/Kg)	38.4
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%R = Found/True*100

GP344-S1 P. 40,41,61 JC27917-3

True Value (mg/kg)	48.3
Native concentration (mg/Kg)	1.3

AECOM %R	76.8	OK	Reported %R	76.8
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Percent Solids

JC27917-3 P. 41 NFS-PDI-AA14B-10.5-11.0

Empty dish weight=	16.96
Wet weight=	24.27
Dry weight=	23.14

AECOM %solids =	84.5	OK	reported %solids=	84.5
-----------------	------	----	-------------------	------

Reporting Limit	JC27917-3	P. 12,41,61	NFS-PDI-AA14B-10.5-11.0
Low Standard	0.01		
Initial weight (mg/kg)	0.00240		
Final volume (L)	0.1		
Percent solids	0.845		
Dilution Factor	1		

Reporting Limit	0.49	OK, rounding	Reported RL (mg/Kg)=	0.47
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Sample Calculations	JC27917-3	P. 12,41,61	NFS-PDI-AA14B-10.5-11.0
Background reading	0		
Total absorbance	0.02		
Total absorbance - background	0.02		
Instrument Response	0.026		
Sample weight (mg/kg)	0.0024		
Final Volume (L)	0.1		
Percent solids	0.845		
Dilution Factor	1		

AECOM Calculated Result (mg/Kg)	1.3	OK	Reported Result (mg/Kg)	1.3
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Data Validation Report

Project:	PPG - North Forrest Street PDI	
Laboratory:	SGS Accutest, Dayton, NJ	
Laboratory Job No.:	JC28302 and JC28302R	
Analysis/Method:	Hexavalent Chromium SW846 3060A/7196	
Validation Level:	Full	
Site Location/Address:	70 Carteret Avenue, Jersey City, NJ	
AECOM Project No:	60314351.GA.DE.PDI.NFS	
Prepared by:	Dawn Brule /AECOM	Completed on: 11/02/2016
Reviewed by:	Mary Kozik/AECOM	File Name: JC28302_R_2016-11-02_DV Report-F

Introduction

The data were reviewed in accordance with the FSP-QAPP and the following NJDEP validation Standard Operating Procedure (SOP):

- NJDEP Office of Data Quality SOP 5.A.10, Rev 3 (September 2009), SOP for Analytical Data Validation of Hexavalent Chromium - for USEPA SW-846 Method 3060A, and USEPA SW-846 Method 7196A;

The results of quality control data analyzed with site samples were used to assess the overall reliability of the data. The following qualifiers were used to identify data quality issues:

- U: Indicates the analyte was not detected in the sample above the sample reporting limit.
- J: Indicates the result was an estimated value; the associated numerical value was an approximate concentration of the analyte in the sample.
- UJ: Indicates the analyte was not detected above the reporting limit and the reporting limit was approximate.
- UB: The analyte concentration is less than or equal to three (3) times the concentration in the associated method/prep blank. The presence of the analyte in the sample is negated (UB) due to laboratory contamination.
- JB: The analyte concentration is greater than three (3) times, but less than or equal to ten (10) times the concentration in the associated method/prep blank. The presence of that analyte in the sample is considered "real". The concentration is quantitatively qualified (JB) due to method blank contamination.
- R: The sample result was rejected due to serious deficiencies; the presence or absence of the analyte could not be confirmed.
- RA: The sample result was rejected but is still considered usable.

Sample Information

The samples listed below were collected by AECOM on September 23, 2016 as part of the PPG - North Forrest Street PDI sampling at 70 Carteret Avenue, Jersey City, NJ. Only the samples and parameters listed below were validated.

Field ID	Laboratory ID	Matrix	Fraction
NFS-FB20160923 (Equipment Blank)	JC28302-1	Aqueous	Hexavalent Chromium
NFS-PDI-EE16B-11.5-12.0	JC28302-2	Soil	Hexavalent Chromium
NFS-PDI-EE16B-11.5-12.0	JC28302-2R	Soil	Hexavalent Chromium

The samples were collected following the procedures detailed in the Work Order for Garfield Avenue Remedial Action (GARA) at 70 Carteret Avenue, Jersey City, NJ and the Field Sampling Plan/Quality Assurance Project Plan for Non-Residential and Residential Chromium Sites Hudson County, New Jersey (December 2011).

General Comments

The data package was complete. Quality control (QC) issues identified during validation are discussed below. Refer to the Target Analyte Summary Hit(s) in Attachment A for a listing of all detected results, qualified results, and associated qualifications, where applicable. The nonconformances for each section discussed below are presented in Attachment B.

Sample Preservation

The sample cooler temperature measured upon sample receipt at the laboratory was 0.8°C, which was below the QC criteria of 2-6°C. No qualifications were applied for this minor nonconformance.

MS Results

Sample NFS-PDI-EE16B-11.5-12.0 was selected for the soil matrix spike analysis and used for supporting data quality recommendations. The soluble and insoluble matrix spike (MS) recoveries from the initial batch were 63.5% and 97.2%, respectively. The soluble MS recovery did not meet quality control (QC) criteria of 75-125%R. The post digestion spike (PDS) recovery was 92%, which met the PDS criteria of 85-115%.

Based on the soluble MS recovery, less than 75%R, the MS and associated samples were reanalyzed using Method 7196. The soluble and insoluble matrix spike recoveries from the re-analysis were 85.9% and 88.4%, respectively. The MS recoveries did meet the QC criteria of 75-125%R. The post spike result for the re-analysis batch was recovered at 97%, which met the PDS criteria of 85-115%.

Since the initial soluble MS recovery was outside the acceptable QC limit of 75-125%, additional parameters were analyzed to determine if possible matrix interferences could be the cause for the low matrix spike recovery. The soil sample was tested for pH and oxidation reduction potential (ORP) and plotted on an Eh/pH phase diagram chart. From this chart, the source sample for the matrix spike analysis was plotted below the phase change line, indicating reducing potential within the sample matrix, incapable of supporting hexavalent chromium. Analyses for ferrous iron, sulfide screen, and total organic carbon (TOC) were performed on the MS source sample to confirm the oxidizing/reducing potential within the sample matrix. The sulfide screen was reported as nondetect, indicating no reducing agents within the sample matrix; however, the ferrous iron (0.65%) and the TOC results (469 mg/Kg) were positive, indicating potential reducing agents within the sample matrix.

The highest detected hexavalent chromium result was reported for the soil sample. Since the result from the initial analysis was reported and the soluble MS recovery from the initial analysis did not meet the MS QC requirements, the soil sample in this SDG was qualified as estimated (J) due to the low MS recovery.

Sample Results

Reported results (flagged B by the laboratory) that were less than the reporting limit (RL), but greater than or equal to the method detection limit (MDL) are approximate values and have been qualified as estimated (J).

Data Quality and Usability

In general, these data appear to be valid and may be used for decision-making purposes. No data were rejected. Qualified results, if applicable, are presented in Attachments A and B.

The hexavalent chromium soil result in this SDG is usable as an estimated value with the potential for low bias due to a low MS recovery. The MS sample matrix appears to be reducing based on the Eh-pH plot and the presence of TOC and ferrous iron. The highest detected hexavalent chromium result was reported for the soil sample.

ATTACHMENTS

Attachment A: Target Analyte Summary Hit List(s)

Attachment B: Data Validation Report Form

Attachment A

Target Analyte Summary Hit List(s)

Soil Target Analyte Summary Hit List (Hexavalent Chromium)

Site Name PPG - North Forrest Street PDI
Sampling Date September 23, 2016
Lab Name/ID SGS Accutest, Dayton, NJ
SDG No JC28302 and JC28302R
Sample Matrix Soil
Trip Blank ID NA
Field Blank ID NFS-FB20160923

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
NFS-PDI-EE16B-11.5-12.0	JC28302-2	CHROMIUM (HEXAVALENT)	U	0.82	0.82	0.44	Qualify	1

Note: A "U" under Method Blank column indicates a nondetect result.

NJDEP Laboratory Footnote

1. The reported value was qualified (J) because the MS recovery was less than 75%, but greater than 50%.

Attachment B

Data Validation Report Form

Client Name: PPG Industries	Project Number: 60314351.GA.DE.PDI.NFS
Site Location: PPG - North Forrest Street PDI, Jersey City, NJ	Project Manager: Aimee Ruitter
Laboratory: SGS Accutest, Dayton, NJ	Type of Validation: Full
Laboratory Job No: JC28302 and JC28302R	Date Checked: 11/2/2016
Validator: Dawn Brule	Peer: Mary Kozik

ITEM	YES	NO	N/A	COMMENTS
Sample results included?	X			
Reporting Limits met project requirements?	X			
Field I.D. included?	X			
Laboratory I.D. included?	X			
Did data package sample IDs match sample IDs on COC?	X			
Did electronic data deliverable (EDD) sample IDs match COC sample IDs?	X			
Did data package sample IDs match electronic data deliverable (EDD) sample IDs?	X			
Sample matrix included?	X			
Sample receipt temperature 2-6°C?		X		0.8°C - no qual needed
Signed COCs included?	X			
Date of sample collection included?	X			
Date of sample digestion included?	X			
Holding time to digestion met criteria? (Soils -30 days from collection to digestion.)	X			
Date of analysis included?	X			
Holding time to analysis met criteria? (Soils -168 hours from digestion to analysis; Aqueous - 24 hours from collection to analysis.)	X			
Method reference included?	X			
Laboratory Case Narrative included?	X			

Definitions: MDL - Method Detection Limit; %R - Percent Recovery; RL - Reporting Limit; RPD - Relative Percent Difference; RSD - Relative Standard Deviation ;Corr - Correlation Coefficient.

ITEM	YES	NO	N/A	COMMENTS
Initial calibration documentation included in lab package?	X			
1) Blank plus 4 standards (7196A) or blank plus 3 standards (7199)	X			
2) Correlation coefficient of =0.995 (7196A) or =0.999 (7199)	X			
3) Calibrate daily or each time instrument is set up.	X			
Calibration Check Standard (CCS) for 7196A and Quality Control Sample (QCS) for 7199 Included in Lab Package?	X			
1) %R criteria met? (90 - 110%)	X			
2) Correct frequency of one per every 10 samples	X			
3) CCS and QCS from independent source and at mid-level of calibration curve	X			
Calibration Blanks	X			
1) Analyzed prior to initial calibration standards and after each CCS/QCS?	X			
2) Absolute value should not exceed MDL.	X			
Method Blank, Field Blanks and/or Equipment Blanks Included in Lab Package?	X			
1) Method blank analyzed with each preparation batch?	X			
2) Absolute value should not exceed MDL.	X			
Eh and pH Data	X			
1) Eh and pH data was included and plotted for all samples?	X			
Soluble Matrix Spike Data Included in Lab Package?	X			
1) Soluble Matrix %R criteria met? (75-125%R).		X		See table below.
2) Was the spike concentration 40 mg/Kg or twice the sample concentration?		X		I=43.3mg/kg & R=45.2mg/kg; no impact to data.
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	X			
Insoluble Matrix Spike Data Included in Lab Package?	X			
1) Insoluble Matrix %R criteria met? (75-125%R).	X			
2) Was the spike concentration around 400 to 800 mg/Kg?		X		I=874mg/kg & R=1320mg/kg; no impact to data.
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	X			

ITEM	YES	NO	N/A	COMMENTS
Post Digestion Spike	X			
1) Post Digestion Spike %R criteria met? (85-115%R).	X			
2) Was the spike concentration 40 mg/Kg or twice the sample concentration?	X			
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	X			
Sample Duplicate Data Included in Lab Package?	X			
1) RPD criteria met? (RPD \leq 20%) if both results are $>4x$ RL or absolute difference \leq RL if either or both results are $<4x$ RL.	X			abs diff $<$ RL
2) Was a sample duplicate analyzed at the frequency of 1 per batch or 20 samples?	X			
Was a Laboratory Control Sample (LCS) Included in Lab Package?	X			
1) %R criteria met? (80-120%R).	X			
2) Was an LCS analyzed at the frequency of 1/batch or 20 samples?	X			
Were any Field Duplicate samples submitted with this SDG?		X		
1) RPD criteria met? (RPD \leq 20%) if both results are $>4x$ RL or absolute difference \leq RL if either or both results are $<4x$ RL.			X	
Were all sample quantitation and reporting requirements met?	X			
1) Were all solid samples reported with percent solids $>$ 50%?	X			
2) Were any samples analyzed or reported with dilutions?		X		
Miscellaneous Items				
1) For soils by 7196A, was the pH within a range of 7.0-8.0?	X			
2) For soils by 7199, was the pH within a range of 9.0-9.5?			X	
3) For aqueous by 7196A, was the pH within a range of 1.5-2.5?	X			
4) For soils (3060A), was the digestion temperature 90-95C for at least 60 minutes?	X			
5) For 7199, was each sample injected twice and was the RPD $<$ 20?			X	

Matrix Spikes

Sample ID	Analyte	Matrix Spike	% Recovery	Lower Limit	Upper Limit	PDS %	PDS Limit %
NFS-PDI-EE16B-11.5-12.0	CHROMIUM (HEXAVALENT)	Soluble	63.5	75	125	92	85-115
NFS-PDI-EE16B-11.5-12.0	CHROMIUM (HEXAVALENT)	Insoluble	97.2	75	125		
NFS-PDI-EE16B-11.5-12.0	CHROMIUM (HEXAVALENT)	Soluble	85.9	75	125	97	85-115
NFS-PDI-EE16B-11.5-12.0	CHROMIUM (HEXAVALENT)	Insoluble	88.4	75	125		

SDG#: JC28302/ Method 7196

Batch: GN52994

Cr+6 ICAL 10/05/16

Soil

(p. 42 of data pkg)

x - concentration	y - response
0	0
0.01	0.009
0.05	0.043
0.1	0.086
0.3	0.241
0.5	0.420
0.8	0.655
1	0.845

(p. 42 of data pkg)

AECOM Calculated Offset	-0.0008	OK	Reported Offset	-0.0008
AECOM Slope	0.8352	OK	Reported Slope	0.8352
AECOM Calculated r	0.99975	OK	Reported r	0.99975

LCS calculation

GP474-B1 P. 17,42

Background Absorbance	0
Total absorbance	0.711
Total absorbance - background	0.711
Instrument Concentration	0.852
Sample weight (mg/kg)	0.0025
Final Volume (L)	0.1
Dilution Factor	1

AECOM Calculated LCS Result (mg/Kg)	34.1	OK	Reported Result (mg/Kg)	34.1
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%R = Found/True*100

GP474-B1 P. 17,42

True Value (mg/kg)	40
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AECOM Calculated %R	85	OK	Reported %R	85
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MS calculation

GP474-S1 P. 19,20,42 JC28302-2

Background reading	0.001
Total absorbance	0.546
Total absorbance - background	0.545
Instrument Concentration	0.6534
Sample weight (mg/kg)	0.00257
Final Volume (L)	0.1
Percent solids	0.899
Dilution Factor	1

AECOM Calculated MS Result (mg/Kg)	28.3	OK	Reported Result (mg/Kg)	28.3
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%R = Found/True*100

GP474-S1 P. 19,20,42 JC28302-2

True Value (mg/kg)	43.3
Native concentration (mg/Kg)	0.82

AECOM %R	63.4	OK, rounding	Reported %R	63.5
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Percent Solids

JC28302-2 P. 20 NFS-PDI-EE16B-11.5-12.0

Empty dish weight=	22.9
Wet weight=	30.05
Dry weight=	29.33

AECOM %solids =	89.9	OK	reported %solids=	89.9
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Reporting Limit	JC28302-2	P. 9,20,42	NFS-PDI-EE16B-11.5-12.0
Low Standard	0.01		
Initial weight (mg/kg)	0.00257		
Final volume (L)	0.1		
Percent solids	0.899		
Dilution Factor	1		
Reporting Limit	0.4	OK	Reported RL (mg/Kg)= 0.4

Sample Calculations	JC28302-2	P. 9,20,42	NFS-PDI-EE16B-11.5-12.0
Background reading	0.002		
Total absorbance	0.017		
Total absorbance - background	0.015		
Instrument Response	0.019		
Sample weight (mg/kg)	0.00257		
Final Volume (L)	0.1		
Percent solids	0.899		
Dilution Factor	1		
AECOM Calculated Result (mg/Kg)	0.82	OK	Reported Result (mg/Kg) 0.82

Data Validation Report

Project: PPG - North Forest Street PDI

Laboratory: SGS/Accutest, Dayton, NJ

Laboratory Job No.: JC31705 and JC31705R

Analysis/Method: Hexavalent Chromium SW846 3060A/7196A

Validation Level: Full

Site Location/Address: 70 Carteret Avenue

AECOM Project No: 60314351.GA.DE.PDI.NFS

Prepared by: Charlene Livingston Flint /AECOM Completed on: 12/05/2016

Reviewed by: Mary Kozik /AECOM File Name: JC31705_R_2016-12-05_DVReport-F

Introduction

The data were reviewed in accordance with the FSP-QAPP and the following NJDEP validation Standard Operating Procedure (SOP):

- NJDEP Office of Data Quality SOP 5.A.10, Rev 3 (September 2009), SOP for Analytical Data Validation of Hexavalent Chromium - for USEPA SW-846 Method 3060A, USEPA SW-846 Method 7196A and USEPA SW-846 Method 7199;

The results of quality control data analyzed with site samples were used to assess the overall reliability of the data. The following qualifiers were used to identify data quality issues:

- U: Indicates the analyte was not detected in the sample above the sample reporting limit.
- J: Indicates the result was an estimated value; the associated numerical value was an approximate concentration of the analyte in the sample.
- UJ: Indicates the analyte was not detected above the reporting limit and the reporting limit was approximate.
- UB: The analyte concentration is less than or equal to three (3) times the concentration in the associated method/prep blank. The presence of the analyte in the sample is negated (UB) due to laboratory contamination.
- JB: The analyte concentration is greater than three (3) times, but less than or equal to ten (10) times the concentration in the associated method/prep blank. The presence of that analyte in the sample is considered "real". The concentration is quantitatively qualified (JB) due to method blank contamination.
- R: The sample result was rejected due to serious deficiencies; the presence or absence of the analyte could not be confirmed.
- RA: The sample result was rejected but is still considered usable.

Sample Information

The samples listed below were collected by AECOM on November 14, 2016 as part of the PPG - North Forest Street PDI sampling at 70 Carteret Avenue, Jersey City, New Jersey. Only the samples and parameters listed below were validated.

Field ID	Laboratory ID	Matrix	Fraction
NFS-FB20161114 (Equipment Blank)	JC31705-1	Aqueous	Hexavalent Chromium
NFS-PDI-CC12BR-0.5-1.0	JC31705-2	Soil	Hexavalent Chromium
NFS-PDI-CC12BR-0.5-1.0	JC31705-2R	Soil	Hexavalent Chromium
NFS-PDI-CC12BR-10.5-11.0	JC31705-3	Soil	Hexavalent Chromium
NFS-PDI-CC12BR-10.5-11.0	JC31705-3R	Soil	Hexavalent Chromium
NFS-PDI-CC12BR-12.5-13.0	JC31705-4	Soil	Hexavalent Chromium
NFS-PDI-CC12BR-12.5-13.0	JC31705-4R	Soil	Hexavalent Chromium
NFS-PDI-CC12BR-14.5-15.0	JC31705-5	Soil	Hexavalent Chromium
NFS-PDI-CC12BR-14.5-15.0	JC31705-5R	Soil	Hexavalent Chromium
NFS-PDI-CC12BR-16.5-17.0	JC31705-6	Soil	Hexavalent Chromium
NFS-PDI-CC12BR-16.5-17.0	JC31705-6R	Soil	Hexavalent Chromium
NFS-PDI-CC12BR-18.5-19.0	JC31705-7	Soil	Hexavalent Chromium
NFS-PDI-CC12BR-18.5-19.0	JC31705-7R	Soil	Hexavalent Chromium
NFS-PDI-CC12BR-2.5-3.0	JC31705-8	Soil	Hexavalent Chromium
NFS-PDI-CC12BR-2.5-3.0	JC31705-8R	Soil	Hexavalent Chromium
NFS-PDI-CC12BR-20.0-20.5	JC31705-9	Soil	Hexavalent Chromium
NFS-PDI-CC12BR-20.0-20.5	JC31705-9R	Soil	Hexavalent Chromium
NFS-PDI-CC12BR-4.5-5.0	JC31705-10	Soil	Hexavalent Chromium
NFS-PDI-CC12BR-4.5-5.0	JC31705-10R	Soil	Hexavalent Chromium
NFS-PDI-CC12BR-5.0-5.5	JC31705-11	Soil	Hexavalent Chromium
NFS-PDI-CC12BR-5.0-5.5	JC31705-11R	Soil	Hexavalent Chromium
NFS-PDI-CC12BR-6.5-7.0	JC31705-12	Soil	Hexavalent Chromium
NFS-PDI-CC12BR-6.5-7.0	JC31705-12R	Soil	Hexavalent Chromium
NFS-PDI-CC12BR-6.5-7.0X (Field Duplicate of NFS-PDI-CC12BR-6.5-7.0)	JC31705-13	Soil	Hexavalent Chromium
NFS-PDI-CC12BR-6.5-7.0X (Field Duplicate of NFS-PDI-CC12BR-6.5-7.0)	JC31705-13R	Soil	Hexavalent Chromium
NFS-PDI-CC12BR-8.5-9.0	JC31705-14	Soil	Hexavalent Chromium
NFS-PDI-CC12BR-8.5-9.0	JC31705-14R	Soil	Hexavalent Chromium
NFS-PDI-CC13BR-0.5-1.0	JC31705-15	Soil	Hexavalent Chromium
NFS-PDI-CC13BR-0.5-1.0	JC31705-15R	Soil	Hexavalent Chromium
NFS-PDI-CC13BR-10.0-10.5	JC31705-16	Soil	Hexavalent Chromium
NFS-PDI-CC13BR-10.0-10.5	JC31705-16R	Soil	Hexavalent Chromium
NFS-PDI-CC13BR-12.0-12.5	JC31705-17	Soil	Hexavalent Chromium
NFS-PDI-CC13BR-12.0-12.5	JC31705-17R	Soil	Hexavalent Chromium
NFS-PDI-CC13BR-14.0-14.5	JC31705-18	Soil	Hexavalent Chromium
NFS-PDI-CC13BR-14.0-14.5	JC31705-18R	Soil	Hexavalent Chromium

Field ID	Laboratory ID	Matrix	Fraction
NFS-PDI-CC13BR-16.0-16.5	JC31705-19	Soil	Hexavalent Chromium
NFS-PDI-CC13BR-16.0-16.5	JC31705-19R	Soil	Hexavalent Chromium
NFS-PDI-CC13BR-18.0-18.5	JC31705-20	Soil	Hexavalent Chromium
NFS-PDI-CC13BR-18.0-18.5	JC31705-20R	Soil	Hexavalent Chromium
NFS-PDI-CC13BR-2.0-2.5	JC31705-21	Soil	Hexavalent Chromium
NFS-PDI-CC13BR-2.0-2.5	JC31705-21R	Soil	Hexavalent Chromium
NFS-PDI-CC13BR-20.0-20.5	JC31705-22	Soil	Hexavalent Chromium
NFS-PDI-CC13BR-20.0-20.5	JC31705-22R	Soil	Hexavalent Chromium
NFS-PDI-CC13BR-4.0-4.5	JC31705-23	Soil	Hexavalent Chromium
NFS-PDI-CC13BR-4.0-4.5	JC31705-23R	Soil	Hexavalent Chromium
NFS-PDI-CC13BR-5.0-5.5	JC31705-24	Soil	Hexavalent Chromium
NFS-PDI-CC13BR-5.0-5.5	JC31705-24R	Soil	Hexavalent Chromium
NFS-PDI-CC13BR-5.5-6.0	JC31705-25	Soil	Hexavalent Chromium
NFS-PDI-CC13BR-5.5-6.0	JC31705-25R	Soil	Hexavalent Chromium
NFS-PDI-CC13BR-6.0-6.5	JC31705-26	Soil	Hexavalent Chromium
NFS-PDI-CC13BR-6.0-6.5	JC31705-26R	Soil	Hexavalent Chromium
NFS-PDI-CC13BR-8.0-8.5	JC31705-27	Soil	Hexavalent Chromium
NFS-PDI-CC13BR-8.0-8.5	JC31705-27R	Soil	Hexavalent Chromium
NFS-PDI-V14BR-13.0-13.5	JC31705-28	Soil	Hexavalent Chromium
NFS-PDI-V14BR-13.0-13.5	JC31705-28R	Soil	Hexavalent Chromium
NFS-PDI-V14BR-15.0-15.5	JC31705-29	Soil	Hexavalent Chromium
NFS-PDI-V14BR-15.0-15.5	JC31705-29R	Soil	Hexavalent Chromium
NFS-PDI-V14BR-15.0-15.5X (Field Duplicate of NFS-PDI-V14BR-15.0-15.5)	JC31705-30	Soil	Hexavalent Chromium
NFS-PDI-V14BR-15.0-15.5X (Field Duplicate of NFS-PDI-V14BR-15.0-15.5)	JC31705-30R	Soil	Hexavalent Chromium
NFS-PDI-V14BR-16.0-16.5	JC31705-31	Soil	Hexavalent Chromium
NFS-PDI-V14BR-16.0-16.5	JC31705-31R	Soil	Hexavalent Chromium
NFS-PDI-V14BR-16.5-17.0	JC31705-32	Soil	Hexavalent Chromium
NFS-PDI-V14BR-16.5-17.0	JC31705-32R	Soil	Hexavalent Chromium

The samples were collected following the procedures detailed in the Work Order for Garfield Avenue Remedial Action (GARA) at 70 Carteret Avenue and the Field Sampling Plan/Quality Assurance Project Plan for Non-Residential and Residential Chromium Sites Hudson County, New Jersey (December 2011).

General Comments

The data package was complete. Quality control (QC) issues identified during validation are discussed below. Refer to the Target Analyte Summary Hitlist(s) in Attachment A for a listing of all detected results, qualified results, and associated qualifications, where applicable. The nonconformances for each section discussed below are presented in Attachment B.

MS Results

Two matrix spike (MS) samples, NFS-PDI-CC12BR-10.5-11.0 (JC31705-3) and NFS-PDI-V14BR-15.0-15.5X (JC31705-30), were analyzed with the samples in this SDG and were used for supporting data quality recommendations. MS samples are associated with field samples using matrix similarities as the primary criteria, then by analytical preparation batch when no matrix match is possible. The following table summarizes each of the MS samples and field samples associated with each, differentiating between those associated by matrix, and those associated by batch.

Spiked Sample	Samples Associated by Matrix	Samples Associated by Batch
NFS-PDI-CC12BR-10.5-11.0 (JC31705-3)	NFS-PDI-CC12BR-12.5-13.0 (JC31705-4) NFS-PDI-CC12BR-14.5-15.0 (JC31705-5) NFS-PDI-CC12BR-16.5-17.0 (JC31705-6) NFS-PDI-CC12BR-18.5-19.0 (JC31705-7) NFS-PDI-CC12BR-20.0-20.5 (JC31705-9) NFS-PDI-CC12BR-5.0-5.5 (JC31705-11) NFS-PDI-CC12BR-6.5-7.0 (JC31705-12) NFS-PDI-CC12BR-6.5-7.0X (JC31705-13) NFS-PDI-CC12BR-8.5-9.0 (JC31705-14) NFS-PDI-CC13BR-10.0-10.5 (JC31705-16) NFS-PDI-CC13BR-12.0-12.5 (JC31705-17) NFS-PDI-CC13BR-14.0-14.5 (JC31705-18) NFS-PDI-CC13BR-16.0-16.5 (JC31705-19) NFS-PDI-CC13BR-18.0-18.5 (JC31705-20) NFS-PDI-CC13BR-20.0-20.5 (JC31705-22) NFS-PDI-CC13BR-5.5-6.0 (JC31705-25) NFS-PDI-CC13BR-6.0-6.5 (JC31705-26) NFS-PDI-CC13BR-8.0-8.5 (JC31705-27)	NFS-PDI-CC12BR-0.5-1.0 (JC31705-2) NFS-PDI-CC12BR-2.5-3.0 (JC31705-8) NFS-PDI-CC12BR-4.5-5.0 (JC31705-10) NFS-PDI-CC13BR-0.5-1.0 (JC31705-15)
NFS-PDI-V14BR-15.0-15.5X (JC31705-30)	NFS-PDI-V14BR-13.0-13.5 (JC31705-28) NFS-PDI-V14BR-15.0-15.5 (JC31705-29) NFS-PDI-V14BR-16.0-16.5 (JC31705-31)	NFS-PDI-CC13BR-2.0-2.5 (JC31705-21) NFS-PDI-CC13BR-4.0-4.5 (JC31705-23) NFS-PDI-CC13BR-5.0-5.5 (JC31705-24) NFS-PDI-V14BR-16.5-17.0 (JC31705-32)

MS sample NFS-PDI-CC12BR-10.5-11.0 (JC31705-3)

Sample NFS-PDI-CC12BR-10.5-11.0, associated with samples as noted above, was selected for the soil matrix spike analysis and used for supporting data quality recommendations. The soluble and insoluble MS recoveries for sample from the initial batch were 74.5% and 83.5%, respectively. The soluble MS recovery did not meet quality control (QC) criteria of 75-125%R. The post digestion spike (PDS) recovery was 92.56%, which met the PDS criteria of 85-115%.

Based on the soluble MS recovery, less than 75%R, the MS and associated samples were reanalyzed using Method 7196. The soluble and insoluble matrix spike recoveries from the re-analysis were 74.1% and 97.8%, respectively. The soluble MS recovery did not meet the QC criteria of 75-125%R. The post spike result for the re-analysis batch was recovered at 94%, which met the PDS criteria of 85-115%.

Since the soluble MS recoveries were outside the acceptable QC limit of 75-125%, additional parameters were analyzed to determine if possible matrix interferences could be the cause for the poor matrix spike recoveries. All the soil samples were tested for pH and oxidation reduction potential (ORP) and plotted on an Eh/pH phase diagram chart. From this chart, the source sample for the matrix spike analysis was plotted above the phase change line, indicating oxidizing potential with the sample matrix capable of supporting hexavalent chromium. Analyses for ferrous iron, sulfide screen, and total organic carbon (TOC) were performed on the MS source sample to confirm the oxidizing/reducing potential within the sample matrix. The sulfide screen was reported as nondetect, indicating no reducing agents within the sample matrix; however, the ferrous iron (2.5 %) and the TOC results (123 mg/Kg) were positive, indicating potential reducing agents within the sample matrix.

Since the MS recoveries from both the initial and reanalysis did not meet the MS QC requirements, but at least one MS recovery was greater than 50%, the highest detected hexavalent chromium result or the nondetect hexavalent chromium result with the lowest reporting limit (RL) was reported for each soil sample. The reported hexavalent chromium results in all the associated soil samples were qualified as estimated (J/UJ) due to the low soluble MS recoveries.

MS sample NFS-PDI-V14BR-15.0-15.5X (JC31705-30)

Sample NFS-PDI-V14BR-15.0-15.5X, associated with samples as noted above, was selected for the soil matrix spike analysis and used for supporting data quality recommendations. The soluble and insoluble MS recoveries from the initial batch were 1.8% and 61.1%, respectively. The soluble and insoluble MS recoveries from the initial batch were 71.7% and 103.7%, respectively. The soluble MS recovery did not meet QC criteria of 75-125%R. The PDS recovery was 94%, which met the PDS criteria of 85-115%.

Based on the soluble MS recovery, less than 75%R, the MS and associated samples were reanalyzed using Method 7196. The soluble and insoluble matrix spike recoveries from the re-analysis were 62.2% and 96.8%, respectively. The soluble MS recovery did not meet the QC criteria of 75-125%R. The post spike result for the re-analysis batch was recovered at 87%, which met the PDS criteria of 85-115%.

Since the soluble MS recoveries were outside the acceptable QC limit of 75-125%, additional parameters were analyzed to determine if possible matrix interferences could be the cause for the poor matrix spike recoveries. All the soil samples were tested for pH and ORP and plotted on an Eh/pH phase diagram chart. From this chart, the source sample for the matrix spike analysis was plotted above the phase change line, indicating oxidizing potential with the sample matrix capable of supporting hexavalent chromium. Analyses for ferrous iron, sulfide screen, and TOC were performed

on the MS source sample to confirm the oxidizing/reducing potential within the sample matrix. The sulfide screen was reported as nondetect, indicating no reducing agents within the sample matrix; however, the ferrous iron (0.31 %) and the TOC results (1190 mg/Kg) were positive, indicating potential reducing agents within the sample matrix.

Since the MS recoveries from both the initial and reanalysis did not meet the MS QC requirements, but at least one MS recovery was greater than 50%, the highest detected hexavalent chromium result or the nondetect hexavalent chromium result with the lowest RL was reported for each soil sample. The reported hexavalent chromium results in all the associated soil samples were qualified as estimated (J) due to the poor MS recoveries.

Laboratory Duplicate Precision

There were two sets of laboratory duplicates, associated with the samples in this SDG that were selected by the laboratory to demonstrate laboratory precision capabilities:

Sample NFS-PDI-CC12BR-10.5-11.0 (JC31705-3, -3R), associated with samples in batch GP1466 or GP1564 (samples JC31705-2, -2R through JC31705-17, -17R), was selected by the laboratory to demonstrate laboratory precision capabilities. All QC criteria were met. No qualifications were made on the associated soil samples.

Sample NFS-PDI-V14BR-15.0-15.5X (JC31705-30, -30R), associated with samples in batch GP1473 or GP1563 (samples JC31705-18, -18R through JC31705-32, -32R), was selected by the laboratory to demonstrate laboratory precision capabilities.

The relative percent difference for hexavalent chromium exceeded the QC acceptance RPD in the reanalysis; therefore, the hexavalent chromium results in the associated soil samples that were reported from the reanalysis were qualified as estimated (J).

Field Duplicate Results

Two field duplicate pairs, NFS-PDI-CC12BR-6.5-7.0 (JC31705-12R) & NFS-PDI-CC12BR-6.5-7.0X (JC31705-13R) and NFS-PDI-V14BR-15.0-15.5 (JC31705-29R) & NFS-PDI-V14BR-15.0-15.5X (JC31705-30R), are associated with the samples in this SDG and were used for supporting data quality recommendations. Field duplicate samples are associated with field samples using matrix similarities as the primary criteria, then by analytical preparation batch when no matrix match is possible. The following table summarizes each of the field duplicate samples and field samples associated with each, differentiating between those associated by matrix, and those associated by batch.

Field Duplicate Sample	Samples Associated for Matrix	Samples Associated by Batch
NFS-PDI-CC12BR-6.5-7.0/ NFS-PDI-CC12BR-6.5-7.0X (JC31705-12R/13R)	NFS-PDI-CC12BR-10.5-11.0 (JC31705-3) NFS-PDI-CC12BR-12.5-13.0 (JC31705-4) NFS-PDI-CC12BR-14.5-15.0 (JC31705-5) NFS-PDI-CC12BR-16.5-17.0 (JC31705-6) NFS-PDI-CC12BR-18.5-19.0 (JC31705-7) NFS-PDI-CC12BR-20.0-20.5 (JC31705-9) NFS-PDI-CC12BR-5.0-5.5 (JC31705-11) NFS-PDI-CC12BR-8.5-9.0 (JC31705-14) NFS-PDI-CC13BR-10.0-10.5 (JC31705-16) NFS-PDI-CC13BR-12.0-12.5 (JC31705-17) NFS-PDI-CC13BR-14.0-14.5 (JC31705-18) NFS-PDI-CC13BR-16.0-16.5 (JC31705-19)	NFS-PDI-CC12BR-0.5-1.0 (JC31705-2) NFS-PDI-CC12BR-2.5-3.0 (JC31705-8) NFS-PDI-CC12BR-4.5-5.0 (JC31705-10) NFS-PDI-CC13BR-0.5-1.0 (JC31705-15)

	NFS-PDI-CC13BR-18.0-18.5 (JC31705-20) NFS-PDI-CC13BR-20.0-20.5 (JC31705-22) NFS-PDI-CC13BR-5.5-6.0 (JC31705-25) NFS-PDI-CC13BR-6.0-6.5 (JC31705-26) NFS-PDI-CC13BR-8.0-8.5 (JC31705-27)	
NFS-PDI-V14BR-15.0-15.5/ NFS-PDI-V14BR-15.0-15.5X (JC31705-29R/30R)	NFS-PDI-V14BR-13.0-13.5 (JC31705-28) NFS-PDI-V14BR-16.0-16.5 (JC31705-31)	NFS-PDI-CC13BR-2.0-2.5 (JC31705-21) NFS-PDI-CC13BR-4.0-4.5 (JC31705-23) NFS-PDI-CC13BR-5.0-5.5 (JC31705-24) NFS-PDI-V14BR-16.5-17.0 (JC31705-32)

The relative percent difference for the reported hexavalent chromium field duplicate results in both field duplicate pairs, NFS-PDI-CC12BR-6.5-7.0 & NFS-PDI-CC12BR-6.5-7.0X and NFS-PDI-V14BR-15.0-15.5 & NFS-PDI-V14BR-15.0-15.5X, associated with samples as noted above, exceeded the QC acceptance RPD; therefore, the reported hexavalent chromium results in the associated soil samples were qualified as estimated (J/UJ).

Sample Results

Reported results (flagged B by the laboratory) that were less than the RL but greater than or equal to the method detection limit (MDL) are approximate values and have been qualified as estimated (J).

Data Quality and Usability

In general, these data appear to be valid and may be used for decision-making purposes. No data were rejected. Qualified results, if applicable, are presented in Attachments A and B.

The hexavalent chromium soil results in this SDG are usable as estimated values with the potential for low bias due to low soluble MS. There were conflicting results regarding the oxidizing/reducing potential of the sample matrix shown by the Eh/pH phase diagram and the additional ancillary parameters. The highest detected hexavalent chromium result or the nondetect hexavalent chromium result with the lowest RL between the initial analysis and reanalysis was reported for each sample.

Sample results qualified due to poor laboratory duplicate precision and or field duplicate precision are usable as estimated values with an unknown directional bias.

Sample results reported between the MDL and RL are usable as estimated values with an unknown directional bias.

ATTACHMENTS

Attachment A: Target Analyte Summary Hitlist(s)

Attachment B: Data Validation Report Form

Attachment A

Target Analyte Summary Hitlist(s)

Soil Target Analyte Summary Hit List (Hexavalent Chromium)

Site Name PPG - North Forest Street PDI
Sampling Date November 14, 2016
Lab Name/ID SGS/Accutest, Dayton, NJ
SDG No JC31705 and JC31705R
Sample Matrix Soil
Trip Blank ID NA
Field Blank ID NFS-FB20161114

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
NFS-PDI-CC12BR-0.5-1.0	JC31705-2R	CHROMIUM (HEXAVALENT)	U	1.6	1.6	0.48	Qualify	1,2
NFS-PDI-CC12BR-10.5-11.0	JC31705-3R	CHROMIUM (HEXAVALENT)	U	51.6	51.6	0.94	Qualify	1,2
NFS-PDI-CC12BR-12.5-13.0	JC31705-4R	CHROMIUM (HEXAVALENT)	U	14.5	14.5	0.50	Qualify	1,2
NFS-PDI-CC12BR-14.5-15.0	JC31705-5R	CHROMIUM (HEXAVALENT)	U	28.6	28.6	0.49	Qualify	1,2
NFS-PDI-CC12BR-16.5-17.0	JC31705-6R	CHROMIUM (HEXAVALENT)	U	36.8	36.8	0.46	Qualify	1,2
NFS-PDI-CC12BR-18.5-19.0	JC31705-7R	CHROMIUM (HEXAVALENT)	U	42.3	42.3	0.49	Qualify	1,2
NFS-PDI-CC12BR-2.5-3.0	JC31705-8R	CHROMIUM (HEXAVALENT)	U	0.34B	0.34	0.45	Qualify	1,2,4
NFS-PDI-CC12BR-20.0-20.5	JC31705-9R	CHROMIUM (HEXAVALENT)	U	35.5	35.5	0.48	Qualify	1,2
NFS-PDI-CC12BR-4.5-5.0	JC31705-10R	CHROMIUM (HEXAVALENT)	U	0.63	0.63	0.51	Qualify	1,2
NFS-PDI-CC12BR-5.0-5.5	JC31705-11R	CHROMIUM (HEXAVALENT)	U	1.9	1.9	0.51	Qualify	1,2
NFS-PDI-CC12BR-6.5-7.0	JC31705-12R	CHROMIUM (HEXAVALENT)	U	28.9	28.9	0.54	Qualify	1,2
NFS-PDI-CC12BR-6.5-7.0X	JC31705-13R	CHROMIUM (HEXAVALENT)	U	22.0	22.0	0.52	Qualify	1,2
NFS-PDI-CC12BR-8.5-9.0	JC31705-14R	CHROMIUM (HEXAVALENT)	U	54.1	54.1	0.95	Qualify	1,2
NFS-PDI-CC13BR-0.5-1.0	JC31705-15R	CHROMIUM (HEXAVALENT)	U	0.62	0.62	0.50	Qualify	1,2
NFS-PDI-CC13BR-10.0-10.5	JC31705-16R	CHROMIUM (HEXAVALENT)	U	5.9	5.9	0.45	Qualify	1,2
NFS-PDI-CC13BR-12.0-12.5	JC31705-17R	CHROMIUM (HEXAVALENT)	U	2.4	2.4	0.50	Qualify	1,2
NFS-PDI-CC13BR-14.0-14.5	JC31705-18R	CHROMIUM (HEXAVALENT)	U	3.5	3.5	0.48	Qualify	1,2,3

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
NFS-PDI-CC13BR-16.0-16.5	JC31705-19R	CHROMIUM (HEXAVALENT)	U	6.8	6.8	0.50	Qualify	1,2,3
NFS-PDI-CC13BR-18.0-18.5	JC31705-20	CHROMIUM (HEXAVALENT)	U	3.5	3.5	0.52	Qualify	1,2
NFS-PDI-CC13BR-2.0-2.5	JC31705-21	CHROMIUM (HEXAVALENT)	U	0.79	0.79	0.47	Qualify	1,2
NFS-PDI-CC13BR-20.0-20.5	JC31705-22R	CHROMIUM (HEXAVALENT)	U	3.6	3.6	0.49	Qualify	1,2,3
NFS-PDI-CC13BR-4.0-4.5	JC31705-23	CHROMIUM (HEXAVALENT)	U	2.2	2.2	0.48	Qualify	1,2
NFS-PDI-CC13BR-5.0-5.5	JC31705-24	CHROMIUM (HEXAVALENT)	U	1.0	1.0	0.51	Qualify	1,2
NFS-PDI-CC13BR-5.5-6.0	JC31705-25	CHROMIUM (HEXAVALENT)	U	0.62	0.62	0.49	Qualify	1,2
NFS-PDI-CC13BR-6.0-6.5	JC31705-26	CHROMIUM (HEXAVALENT)	U	U	U	0.50	Qualify	1,2
NFS-PDI-CC13BR-8.0-8.5	JC31705-27R	CHROMIUM (HEXAVALENT)	U	38.7	38.7	0.52	Qualify	1,2,3
NFS-PDI-V14BR-13.0-13.5	JC31705-28R	CHROMIUM (HEXAVALENT)	U	0.40B	0.40	0.47	Qualify	1,2,3,4
NFS-PDI-V14BR-15.0-15.5	JC31705-29R	CHROMIUM (HEXAVALENT)	U	0.68	0.68	0.46	Qualify	1,2,3
NFS-PDI-V14BR-15.0-15.5X	JC31705-30R	CHROMIUM (HEXAVALENT)	U	2.3	2.3	0.46	Qualify	1,2,3
NFS-PDI-V14BR-16.0-16.5	JC31705-31R	CHROMIUM (HEXAVALENT)	U	0.72	0.72	0.45	Qualify	1,2,3
NFS-PDI-V14BR-16.5-17.0	JC31705-32	CHROMIUM (HEXAVALENT)	U	0.79	0.79	0.69	Qualify	1,2

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

NJDEP Laboratory Footnote

1. The reported value was qualified because the matrix spike recovery was less than 75 %, but greater than 50%.
2. In the Field Duplicate Sample Analysis, Hexavalent Chromium fell outside the control limits of $\leq 20\%$ for sample results $> 4xRL$ or $+ RL$ for sample results $< 4xRL$. Therefore, the result was qualified.
3. In the Duplicate Sample Analysis, Hexavalent Chromium fell outside the control limits of ≤ 20 percent for sample results $> 4xRL$ or $+ RL$ for sample results $< 4xRL$. Therefore, the result was qualified.

4. The reported result was greater than the MDL but less than the RL and qualified (J) as estimated by the laboratory.

Attachment B

Data Validation Report Form

Client Name: PPG Industries	Project Number: 60314351.GA.DE.PDI.NFS
Site Location: PPG - North Forest Street PDI, Jersey City, NJ	Project Manager: Aimee Ruiter
Laboratory: SGS/Accutest, Dayton, NJ	Type of Validation: Full
Laboratory Job No: JC31705 and JC31705R	Date Checked: 12/05/2016
Validator: Charlene Livingston Flint	Peer: Mary Kozik

ITEM	YES	NO	N/A	COMMENTS
Sample results included?	X			
Reporting Limits met project requirements?	X			
Field I.D. included?	X			
Laboratory I.D. included?	X			
Did data package sample IDs match sample IDs on COC?	X			
Did electronic data deliverable (EDD) sample IDs match COC sample IDs?	X			
Did data package sample IDs match electronic data deliverable (EDD) sample IDs?	X			
Sample matrix included?	X			
Sample receipt temperature 2-6° C?	X			3.1 °C
Signed COCs included?	X			COC not signed completely on all pages. Some dates missing. Initial release not signed on sequential pages. No qualifications made based on COC.
Date of sample collection included?	X			
Date of sample digestion included?	X			
Holding time to digestion met criteria? (Soils -30 days from collection to digestion.)	X			
Date of analysis included?	X			
Holding time to analysis met criteria? (Soils -168 hours from digestion to analysis; Aqueous - 24 hours from collection to analysis.)	X			
Method reference included?	X			
Laboratory Case Narrative included?	X			

Definitions: MDL - Method Detection Limit; %R - Percent Recovery; RL - Reporting Limit; RPD - Relative Percent Difference; RSD - Relative Standard Deviation :Corr - Correlation Coefficient.

ITEM	YES	NO	N/A	COMMENTS
Initial calibration documentation included in lab package?	X			
1) Blank plus 4 standards (7196A) or blank plus 3 standards (7199)	X			
2) Correlation coefficient of =0.995 (7196A) or =0.999 (7199)	X			
3) Calibrate daily or each time instrument is set up.	X			
Calibration Check Standard (CCS) for 7196A and Quality Control Sample (QCS) for 7199 Included in Lab Package?	X			
1) %R criteria met? (90 - 110%)	X			
2) Correct frequency of one per every 10 samples	X			
3) CCS and QCS from independent source and at mid- level of calibration curve	X			
Calibration Blanks	X			
1) Analyzed prior to initial calibration standards and after each CCS/QCS?	X			
2) Absolute value should not exceed MDL.	X			
Method Blank, Field Blanks and/or Equipment Blanks Included in Lab Package?	X			
1) Method blank analyzed with each preparation batch?	X			
2) Absolute value should not exceed MDL.	X			
Eh and pH Data	X			
1) Eh and pH data was included and plotted for all samples?	X			
Soluble Matrix Spike Data Included in Lab Package?	X			2 sets, JC31705-3, -3R and JC31705-30, -30R
1) Soluble Matrix %R criteria met? (75-125%R).		X		See nonconformance tables.
2) Was the spike concentration 40 mg/Kg or twice the sample concentration?		X		Spiked at 47.9, 49.1, 47.8 and 45 mg/kg. No impact on data.
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	X			
Insoluble Matrix Spike Data Included in Lab Package?	X			
1) Insoluble Matrix %R criteria met? (75-125%R).	X			
2) Was the spike concentration around 400 to 800 mg/Kg?		X		Spiked at 1020, 789, 1110 and 1150 mg/kg. No impact on data.
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	X			

Post Digestion Spike	X			
1) Post Digestion Spike %R criteria met? (85-115%R).	X			
2) Was the spike concentration 40 mg/Kg or twice the sample concentration?	X			
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	X			
Sample Duplicate Data Included in Lab Package?	X			2 sets. JC31705-3, -3R and JC31705-30, -30R
1) RPD criteria met? (RPD < 20%) if both results are $\geq 4x$ RL or control limit of \pm RL if both results are $< 4xRL$.		X		JC31705-30R did not meet RPD criteria. See table.
2) Was a sample duplicate analyzed at the frequency of 1 per batch or 20 samples?	X			
Was a Laboratory Control Sample (LCS) Included in Lab Package?	X			
1) %R criteria met? (80-120%R).	X			
2) Was an LCS analyzed at the frequency of 1/batch or 20 samples?	X			
Were any Field Duplicate samples submitted with this SDG?	X			2 sets. NFS-PDI-CC12BR-6.5-7.0 (JC31705-12R) & NFS-PDI-CC12BR-6.5-7.0X (JC31705-13R) and NFS-PDI-V14BR-15.0-15.5 (JC31705-29R) & NFS-PDI-V14BR-15.0-15.5X (JC31705-30R)
1) RPD criteria met? (RPD < 20%) if both results are $\geq 4x$ RL or control limit of \pm RL if both results are $< 4xRL$.		X		See table.
Were all sample quantitation and reporting requirements met?	X			
1) Were all solid samples reported with percent solids > 50%?	X			
2) Were any samples analyzed or reported with dilutions?	X			Sample JC31705-3R and JC31705-14R diluted 2x.
Miscellaneous Items	X			
1) For soils by 7196A, was the pH within a range of 7.0-8.0?	X			
2) For soils by 7199, was the pH within a range of 9.0-9.5?			X	
3) For aqueous by 7196A, was the pH with a range of 1.5-2.5?	X			
4) For soils (3060A), was the digestion temperature 90-95C for at least 60 minutes?	X			
5) For 7199, was each sample injected twice and was the RPD ≤ 20 ?			X	

Matrix Spikes

Sample ID	Lab ID	Analyte	Matrix Spike	% Recovery	Lower Limit	Upper Limit	PDS%	PDS Limit %
NFS-PDI-CC12BR-10.5-11.0	JC31705-3R	CHROMIUM (HEXAVALENT)	Insoluble	97.8	75	125	94	85-115
NFS-PDI-CC12BR-10.5-11.0	JC31705-3R	CHROMIUM (HEXAVALENT)	Soluble	74.1	75	125		
NFS-PDI-CC12BR-10.5-11.0	JC31705-3	CHROMIUM (HEXAVALENT)	Soluble	74.5	75	125	92.56	85-115
NFS-PDI-CC12BR-10.5-11.0	JC31705-3	CHROMIUM (HEXAVALENT)	Insoluble	83.5	75	125		
NFS-PDI-V14BR-15.0-15.5X	JC31705-30	CHROMIUM (HEXAVALENT)	Insoluble	103.7	75	125	94	85-115
NFS-PDI-V14BR-15.0-15.5X	JC31705-30	CHROMIUM (HEXAVALENT)	Soluble	71.7	75	125		
NFS-PDI-V14BR-15.0-15.5X	JC31705-30R	CHROMIUM (HEXAVALENT)	Soluble	62.2	75	125	87	85-115
NFS-PDI-V14BR-15.0-15.5X	JC31705-30R	CHROMIUM (HEXAVALENT)	Insoluble	96.8	75	125		

Lab Duplicates

Sample ID	Duplicate ID	Analyte	Sample Result	Qual	Duplicate Result	Qual	QL	Units	RPD	Action
NFS-PDI-CC12BR-10.5-11.0	JC31705-3	CHROMIUM (HEXAVALENT)	39.5		36.6		0.47	mg/kg	7.6	OK
NFS-PDI-CC12BR-10.5-11.0	JC31705-3R	CHROMIUM (HEXAVALENT)	51.6		50.4		0.94	mg/kg	2.4	OK
NFS-PDI-V14BR-15.0-15.5X	JC31705-30	CHROMIUM (HEXAVALENT)	0.80		1.1		0.46	mg/kg	31.6	SR<4xRL, Abs Diff<RL, Accept
NFS-PDI-V14BR-15.0-15.5X	JC31705-30R	CHROMIUM (HEXAVALENT)	2.3		0.33	U	0.46	mg/kg	149.8	SR>4xRL, RPD>20, Estimate (J/UJ)

Field Duplicates

Sample ID	Duplicate ID	Lab ID	Analyte	Sample Result	Qual	Duplicate Result	Qual	QL	Units	RPD	Action
NFS-PDI-CC12BR-6.5-7.0	NFS-PDI-CC12BR-6.5-7.0X	JC31705-12R/13R	CHROMIUM (HEXAVALENT)	28.9		22		0.54	mg/kg	27.1	Estimate (J/UJ)
NFS-PDI-V14BR-15.0-15.5	NFS-PDI-V14BR-15.0-15.5X	JC31705-29R/30R	CHROMIUM (HEXAVALENT)	0.68		2.3		0.46	mg/kg	108.7	Estimate (J)

Percent Solids

Sample ID	Percent Solids (%)	Status
NFS-PDI-CC12BR-0.5-1.0	83.3	ok @50%
NFS-PDI-CC12BR-10.5-11.0	84.8	ok @50%
NFS-PDI-CC12BR-12.5-13.0	80.5	ok @50%
NFS-PDI-CC12BR-14.5-15.0	82	ok @50%
NFS-PDI-CC12BR-16.5-17.0	86.8	ok @50%
NFS-PDI-CC12BR-18.5-19.0	81.8	ok @50%
NFS-PDI-CC12BR-2.5-3.0	89.4	ok @50%
NFS-PDI-CC12BR-20.0-20.5	82.9	ok @50%
NFS-PDI-CC12BR-4.5-5.0	78.7	ok @50%
NFS-PDI-CC12BR-5.0-5.5	77.7	ok @50%
NFS-PDI-CC12BR-6.5-7.0	74.7	ok @50%
NFS-PDI-CC12BR-6.5-7.0X	76.8	ok @50%
NFS-PDI-CC12BR-8.5-9.0	84.1	ok @50%
NFS-PDI-CC13BR-0.5-1.0	80	ok @50%
NFS-PDI-CC13BR-10.0-10.5	88.2	ok @50%
NFS-PDI-CC13BR-12.0-12.5	80.8	ok @50%

Sample ID	Percent Solids (%)	Status
NFS-PDI-CC13BR-14.0-14.5	83.4	ok @50%
NFS-PDI-CC13BR-16.0-16.5	79.7	ok @50%
NFS-PDI-CC13BR-18.0-18.5	77	ok @50%
NFS-PDI-CC13BR-2.0-2.5	85.5	ok @50%
NFS-PDI-CC13BR-20.0-20.5	81.3	ok @50%
NFS-PDI-CC13BR-4.0-4.5	82.7	ok @50%
NFS-PDI-CC13BR-5.0-5.5	77.9	ok @50%
NFS-PDI-CC13BR-5.5-6.0	81.3	ok @50%
NFS-PDI-CC13BR-6.0-6.5	80.8	ok @50%
NFS-PDI-CC13BR-8.0-8.5	77.6	ok @50%
NFS-PDI-V14BR-13.0-13.5	84.3	ok @50%
NFS-PDI-V14BR-15.0-15.5	86.5	ok @50%
NFS-PDI-V14BR-15.0-15.5X	87.1	ok @50%
NFS-PDI-V14BR-16.0-16.5	89.4	ok @50%
NFS-PDI-V14BR-16.5-17.0	58.3	ok @50%

SDG#: JC31705/ Method 7196

Batch: GN55262

Cr+6 ICAL 11/17/16

Soil

(p. 114 of data pkg)

x - concentration	y - response
0	0
0.01	0.01
0.05	0.035
0.1	0.084
0.3	0.238
0.5	0.391
0.8	0.630
1	0.799

(p. 114 of data pkg)

AECOM Calculated Offset	-0.0004	OK	Reported Offset	-0.0004
AECOM Slope	0.7936	OK	Reported Slope	0.7936
AECOM Calculated r	0.99990	OK	Reported r	0.99990

LCS calculation

GP1473-B1

P. 86,114

Background Absorbance

0

Total absorbance

0.729

Total absorbance - background

0.729

Instrument Concentration

0.919

Sample weight (mg/kg)

0.0025

Final Volume (L)

0.1

Dilution Factor

1

AECOM Calculated LCS Result (mg/Kg)	36.8	OK	Reported Result (mg/Kg)	36.8
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%R = Found/True*100

GP1473-B1

P. 86,114

True Value (mg/kg)

40

AECOM Calculated %R	91.9	OK, rounding	Reported %R	92.0
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MS calculation

GP1473-S1

P. 88,93,114

JC31705-30

Background reading

0.003

Total absorbance

0.585

Total absorbance - background

0.582

Instrument Concentration

0.7339

Sample weight (mg/kg)

0.0024

Final Volume (L)

0.1

Percent solids

0.871

Dilution Factor

1

AECOM Calculated MS Result (mg/Kg)	35.1	OK	Reported Result (mg/Kg)	35.1
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%R = Found/True*100

GP1473-S1

P. 88,93,114

JC31705-30

True Value (mg/kg)

47.8

Native concentration (mg/Kg)

0.8

AECOM %R	71.8	OK, rounding	Reported %R	71.7
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Percent Solids

JC31705-30

P. 93

NFS-PDI-V14BR-15.0-15.5X

Empty dish weight=

20.88

Wet weight=

29.64

Dry weight=	28.51		
AECOM %solids =	87.1	OK	Reported %solids= 87.1

Reporting Limit	JC31705-30	P. 44,93,114	NFS-PDI-V14BR-15.0-15.5X
Low Standard	0.01		
Initial weight (mg/kg)	0.00241		
Final volume (L)	0.1		
Percent solids	0.871		
Dilution Factor	1		
Reporting Limit	0.48	OK, rounding	Reported RL (mg/Kg)= 0.46

Sample Calculations	JC31705-30	P. 44,93,114	NFS-PDI-V14BR-15.0-15.5X
Background reading	0.008		
Total absorbance	0.021		
Total absorbance - background	0.013		
Instrument Response	0.017		
Sample weight (mg/kg)	0.00241		
Final Volume (L)	0.1		
Percent solids	0.871		
Dilution Factor	1		
AECOM Calculated Result (mg/Kg)	0.80	OK	Reported Result (mg/Kg) 0.80

Associated with samples JC31705-18 through JC31705-32

SDG#: JC31705/ Method 7196

Batch: GN55278

Cr+6 ICAL 11/17/16

Soil

(p. 123 of data pkg)

x - concentration	y - response
0	0
0.01	0.009
0.05	0.041
0.1	0.085
0.3	0.247
0.5	0.401
0.8	0.675
1	0.822

(p. 123 of data pkg)

AECOM Calculated Offset	-0.0004	OK	Reported Offset	-0.0004
AECOM Slope	0.8272	OK	Reported Slope	0.8272
AECOM Calculated r	0.99974	OK	Reported r	0.99974

LCS calculation

GP1466-B1

P. 86,123

Background Absorbance	0
Total absorbance	0.677
Total absorbance - background	0.677
Instrument Concentration	0.819
Sample weight (mg/kg)	0.0025
Final Volume (L)	0.1
Dilution Factor	1

AECOM Calculated LCS Result (mg/Kg)	32.8	OK	Reported Result (mg/Kg)	32.8
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%R = Found/True*100

GP1466-B1

P. 86,123

True Value (mg/kg)	40
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AECOM Calculated %R	81.9	OK, rounding	Reported %R	82.0
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MS calculation

GP1466-S1

P. 88,89,123

JC31705-3

Background reading	0.007
Total absorbance	0.266
Total absorbance - background	0.259
Instrument Concentration	0.3136
Sample weight (mg/kg)	0.00246
Final Volume (L)	0.1
Percent solids	0.848
Dilution Factor	5

AECOM Calculated MS Result (mg/Kg)	75.2	OK	Reported Result (mg/Kg)	75.2
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%R = Found/True*100

GP1466-S1

P. 88,89,123

JC31705-3

True Value (mg/kg)	47.9
Native concentration (mg/Kg)	39.5

AECOM %R	74.4	OK, rounding	Reported %R	74.5
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Percent Solids	JC31705-3	P. 89	NFS-PDI-CC12BR-10.5-11.0
Empty dish weight=	24.25		
Wet weight=	30.82		
Dry weight=	29.82		
AECOM %solids =	84.8	OK	Reported %solids= 84.8

Reporting Limit	JC31705-3	P.17, 89,123	NFS-PDI-CC12BR-10.5-11.0
Low Standard	0.01		
Initial weight (mg/kg)	0.00247		
Final volume (L)	0.1		
Percent solids	0.848		
Dilution Factor	1		
Reporting Limit	0.48	OK, rounding	Reported RL (mg/Kg)= 0.47

Sample Calculations	JC31705-3	P.17, 89,123	NFS-PDI-CC12BR-10.5-11.0
Background reading	0.001		
Total absorbance	0.685		
Total absorbance - background	0.684		
Instrument Response	0.827		
Sample weight (mg/kg)	0.00247		
Final Volume (L)	0.1		
Percent solids	0.848		
Dilution Factor	1		
AECOM Calculated Result (mg/Kg)	39.5	OK	Reported Result (mg/Kg) 39.5

Associated with samples JC31705-2 through JC31705-17

SDG#: JC31705R/ Method 7196

Batch: GN55489

Cr+6 ICAL 11/22/16

Soil

(p. 147 of data pkg)

x - concentration	y - response
0	0.001
0.01	0.012
0.05	0.043
0.1	0.083
0.3	0.244
0.5	0.414
0.8	0.659
1	0.840

(p. 147 of data pkg)

AECOM Calculated Offset	-0.0001	OK	Reported Offset	-0.0001
AECOM Slope	0.8322	OK	Reported Slope	0.8322
AECOM Calculated r	0.99989	OK	Reported r	0.99989

LCS calculation

GP1563-B1

P. 80,147

Background Absorbance	0
Total absorbance	0.789
Total absorbance - background	0.789
Instrument Concentration	0.948
Sample weight (mg/kg)	0.0025
Final Volume (L)	0.1
Dilution Factor	1

AECOM Calculated LCS Result (mg/Kg)	37.9	OK	Reported Result (mg/Kg)	37.9
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%R = Found/True*100

GP1563-B1

P. 80,147

True Value (mg/kg)	40
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AECOM Calculated %R	94.8	OK	Reported %R	94.8
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MS calculation

GP1563-S1

P. 82,93,147

JC31705-30R

Background reading	0.01
Total absorbance	0.57
Total absorbance - background	0.56
Instrument Concentration	0.6730
Sample weight (mg/kg)	0.00255
Final Volume (L)	0.1
Percent solids	0.871
Dilution Factor	1

AECOM Calculated MS Result (mg/Kg)	30.3	OK	Reported Result (mg/Kg)	30.3
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%R = Found/True*100

GP1563-S1

P. 82,93,147

JC31705-30R

True Value (mg/kg)	45
Native concentration (mg/Kg)	2.3

AECOM %R	62.2	OK	Reported %R	62.2
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Percent Solids	JC31705-30R	P. 93	NFS-PDI-V14BR-15.0-15.5X
Empty dish weight=	20.88		
Wet weight=	29.64		
Dry weight=	28.51		
AECOM %solids =	87.1	OK	Reported %solids= 87.1

Reporting Limit	JC31705-30R	P. 30,93,147	NFS-PDI-V14BR-15.0-15.5X
Low Standard	0.01		
Initial weight (mg/kg)	0.00254		
Final volume (L)	0.1		
Percent solids	0.871		
Dilution Factor	1		
Reporting Limit	0.45	OK, rounding	Reported RL (mg/Kg)= 0.46

Sample Calculations	JC31705-30R	P. 30,93,147	NFS-PDI-V14BR-15.0-15.5X
Background reading	0.011		
Total absorbance	0.054		
Total absorbance - background	0.043		
Instrument Response	0.052		
Sample weight (mg/kg)	0.00254		
Final Volume (L)	0.1		
Percent solids	0.871		
Dilution Factor	1		
AECOM Calculated Result (mg/Kg)	2.3	OK	Reported Result (mg/Kg) 2.3

Associated with samples JC31705-18R through JC31705-32R

SDG#: JC31705R/ Method 7196

Batch: GN55484

Cr+6 ICAL 11/22/16

Soil

(p. 138 of data pkg)

x - concentration	y - response
0	0.001
0.01	0.009
0.05	0.041
0.1	0.082
0.3	0.252
0.5	0.411
0.8	0.664
1	0.836

(p. 138 of data pkg)

AECOM Calculated Offset	-0.0003	OK	Reported Offset	-0.0003
AECOM Slope	0.8329	OK	Reported Slope	0.8329
AECOM Calculated r	0.99996	OK	Reported r	0.99996

LCS calculation

GP1564-B1

P. 80,138

Background Absorbance	0
Total absorbance	0.685
Total absorbance - background	0.685
Instrument Concentration	0.823
Sample weight (mg/kg)	0.0025
Final Volume (L)	0.1
Dilution Factor	1

AECOM Calculated LCS Result (mg/Kg)	32.9	OK	Reported Result (mg/Kg)	32.9
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%R = Found/True*100

GP1564-B1

P. 80,138

True Value (mg/kg)	40
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AECOM Calculated %R	82.3	OK	Reported %R	82.3
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MS calculation

GP1564-S1

P. 82,89,138

JC31705-3R

Background reading	0
Total absorbance	0.298
Total absorbance - background	0.298
Instrument Concentration	0.3582
Sample weight (mg/kg)	0.0024
Final Volume (L)	0.1
Percent solids	0.848
Dilution Factor	5

AECOM Calculated MS Result (mg/Kg)	88.0	OK	Reported Result (mg/Kg)	88.0
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%R = Found/True*100

GP1564-S1

P. 82,89,138

JC31705-3R

True Value (mg/kg)	49.1
Native concentration (mg/Kg)	51.6

AECOM %R	74.1	OK	Reported %R	74.1
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Percent Solids	JC31705-3R	P. 89	NFS-PDI-CC12BR-10.5-11.0
Empty dish weight=	24.25		
Wet weight=	30.82		
Dry weight=	29.82		
AECOM %solids =	84.8	OK	Reported %solids= 84.8

Reporting Limit	JC31705-3R	P. 14,89,138	NFS-PDI-CC12BR-10.5-11.0
Low Standard	0.01		
Initial weight (mg/kg)	0.00251		
Final volume (L)	0.1		
Percent solids	0.848		
Dilution Factor	2		
Reporting Limit	0.94	OK	Reported RL (mg/Kg)= 0.94

Sample Calculations	JC31705-3R	P. 14,89,138	NFS-PDI-CC12BR-10.5-11.0
Background reading	0		
Total absorbance	0.457		
Total absorbance - background	0.457		
Instrument Response	0.549		
Sample weight (mg/kg)	0.00251		
Final Volume (L)	0.1		
Percent solids	0.848		
Dilution Factor	2		
AECOM Calculated Result (mg/Kg)	51.6	OK	Reported Result (mg/Kg) 51.6

Associated with samples JC31705-2R through JC31705-17R

Data Validation Report

Project:	PPG - North Forest Street PDI
Laboratory:	SGS/Accutest, Dayton, NJ
Laboratory Job No.:	JC31705A
Analysis/Method:	Volatile Organic Compounds (VOCs) by GCMS/SW-846 8260C Semivolatile Organic Compounds (SVOCs) by GCMS/SW-846 8270D TAL Metals SW-846 3010A/3050B/6010C/7470A/7471B
Validation Level:	Limited
Site Location/Address:	70 Carteret Avenue
AECOM Project No:	60314351.GA.DE.PDI.NFS
Prepared by:	Charlene Livingston Flint /AECOM Completed on: 12/06/2016
Reviewed by:	Kristin Rutherford /AECOM File Name: JC31705A_2016-12-06_DVReport-F

Introduction

The data were reviewed in accordance with the FSP-QAPP and the following NJDEP and / or Region 2 validation Standard Operating Procedure(s) (SOP):

- NJDEP Office of Data Quality SOP 5.A.16, Rev 1 (May 2002), Quality Assurance Data Validation of Analytical Deliverables for Inorganics (based on USEPA SW-846 Methods);
- ICP-AES Data Validation, SOP No. HW-3a Revision 0 (July 2015);
- Mercury and Cyanide Data Validation, SOP No. HW-3c Revision 0 (July 2015);
- Low/Medium Volatile Data Validation, SOP No. HW-33A Revision 0 (July 2015);
- Semivolatile Data Validation SOP No. HW-35A Revision 0 (June 2015).

The results of quality control data analyzed with site samples were used to assess the overall reliability of the data. The following qualifiers were used to identify data quality issues:

- U: Indicates the analyte was not detected in the sample above the sample reporting limit.
- J: Indicates the result was an estimated value; the associated numerical value was an approximate concentration of the analyte in the sample.
- UJ: Indicates the analyte was not detected above the reporting limit and the reporting limit was approximate.
- UB: The analyte concentration is less than or equal to three (3) times the concentration in the associated method/prep blank. The presence of the analyte in the sample is negated (UB) due to laboratory contamination.

- JB: The analyte concentration is greater than three (3) times, but less than or equal to ten (10) times the concentration in the associated method/prep blank. The presence of that analyte in the sample is considered "real". The concentration is quantitatively qualified (JB) due to method blank contamination.
- JN: Presumptive evidence of a compound; quantitation estimated.
- R: The sample result was rejected due to serious deficiencies; the presence or absence of the analyte could not be confirmed.
- RA: The sample result was rejected due to NJ specific data validation QC requirements; however, the result is usable for project objectives. Refer to the Data Quality and Usability section in this data validation report for further discussion.

Sample Information

The samples listed below were collected by AECOM on November 14, 2016 as part of the PPG - North Forest Street PDI sampling at 70 Carteret Avenue, Jersey City, New Jersey. Only the samples and parameters listed below were validated.

Field ID	Laboratory ID	Matrix	Fraction
NFS-FB20161114 (Equipment Blank)	JC31705-1A	Aqueous	TAL Metals, SVOCs and VOCs
NFS-PDI-CC12BR-0.5-1.0	JC31705-2A	Soil	TAL Metals, SVOCs and VOCs
NFS-PDI-CC12BR-10.5-11.0	JC31705-3A	Soil	TAL Metals, SVOCs and VOCs
NFS-PDI-CC12BR-12.5-13.0	JC31705-4A	Soil	TAL Metals, SVOCs and VOCs
NFS-PDI-CC12BR-14.5-15.0	JC31705-5A	Soil	TAL Metals, SVOCs and VOCs
NFS-PDI-CC12BR-16.5-17.0	JC31705-6A	Soil	TAL Metals, SVOCs and VOCs
NFS-PDI-CC12BR-18.5-19.0	JC31705-7A	Soil	TAL Metals, SVOCs and VOCs
NFS-PDI-CC12BR-2.5-3.0	JC31705-8A	Soil	TAL Metals, SVOCs and VOCs
NFS-PDI-CC12BR-20.0-20.5	JC31705-9A	Soil	TAL Metals, SVOCs and VOCs
NFS-PDI-CC12BR-4.5-5.0	JC31705-10A	Soil	TAL Metals, SVOCs and VOCs
NFS-PDI-CC12BR-5.0-5.5	JC31705-11A	Soil	TAL Metals, SVOCs and VOCs
NFS-PDI-CC12BR-6.5-7.0	JC31705-12A	Soil	TAL Metals, SVOCs and VOCs
NFS-PDI-CC12BR-6.5-7.0X (Field Duplicate of NFS-PDI-CC12BR-6.5-7.0)	JC31705-13A	Soil	TAL Metals, SVOCs and VOCs
NFS-PDI-CC12BR-8.5-9.0	JC31705-14A	Soil	TAL Metals, SVOCs and VOCs

The samples were collected following the procedures detailed in the Work Order for Garfield Avenue Remedial Action (GARA) at 70 Carteret Avenue and the Field Sampling Plan/Quality Assurance Project Plan for Non-Residential and Residential Chromium Sites Hudson County, New Jersey (December 2011).

General Comments

The data package was complete. Quality control (QC) issues identified during validation are discussed below. Refer to the Target Analyte Summary Hit(s) in Attachment A for a listing of all detected results, qualified results, and associated qualifications, where applicable. The nonconformances for each section discussed below are presented in Attachment B.

TAL Metals

Laboratory Blanks/Equipment Blanks

Aluminum, barium, beryllium, calcium, chromium, copper, iron, magnesium, manganese, sodium and zinc were detected in the method blank (MB) MP97190, associated with all of the soil samples in this data set. With the exception of beryllium and sodium, these compounds were detected in all of the associated soil samples at concentrations greater than ten times the amount in the method blank; therefore, no qualifications were made.

Beryllium was detected at concentrations greater than ten times the amount in the MB in all of the soil samples with the exception of sample NFS-PDI-CC12BR-18.5-19.0 (JC31705-7A) which reported a concentration greater than three times but less than ten times the amount in the MB; therefore beryllium was estimated (JB) in sample NFS-PDI-CC12BR-18.5-19.0.

Sodium was detected in sample NFS-PDI-CC12BR-16.5-17.0 (JC31705-6A) at a concentration greater than ten times the amount in the method blank; therefore, no qualifications were made for sodium in sample NFS-PDI-CC12BR-16.5-17.0. All other soil samples reported sodium at concentrations greater than three times but less than ten times the amount in the MB; therefore, sodium was estimated (JB) in all of these soil samples.

Mercury was detected in the method blank MP97177 which was associated with all of the soil samples. The concentrations of mercury in samples NFS-PDI-CC12BR-0.5-1.0 (JC31705-2A), NFS-PDI-CC12BR-2.5-3.0 (JC31705-8A), NFS-PDI-CC12BR-4.5-5.0 (JC31705-10A) and NFS-PDI-CC12BR-5.0-5.5 (JC31705-11A) were greater than ten times the amount in the method blank; therefore, no qualifications were made for mercury in these samples.

Mercury was reported at concentrations greater than three times but less than ten times the amount in the MB in samples NFS-PDI-CC12BR-6.5-7.0 (JC31705-12A) and NFS-PDI-CC12BR-6.5-7.0X (JC31705-13A); therefore, mercury was estimated (JB) in these samples.

Mercury was reported at concentrations less than three times the amount in the MB in all of the remaining samples; therefore, mercury was negated (UB) at the reporting limit (RL) in samples NFS-PDI-CC12BR-10.5-11.0 (JC31705-3A), NFS-PDI-CC12BR-14.5-15.0 (JC31705-5A), NFS-PDI-CC12BR-16.5-17.0 (JC31705-6A), NFS-PDI-CC12BR-18.5-19.0 (JC31705-7A), NFS-PDI-CC12BR-20.0-20.5 (JC31705-9A) and NFS-PDI-CC12BR-8.5-9.0 (JC31705-14A).

The equipment blank (EB), NFS-FB20161114, reported sodium, barium and zinc. All of the associated soil samples reported concentrations greater than ten times the amount in the EB; therefore, no qualifications were made.

Refer to the Target Analyte Summary Hitlist(s) in Attachment A for a listing of all results qualified on the basis of method and equipment blank contamination. Refer to the nonconformance tables in Appendix B for a listing of blank results and associated qualification actions.

Matrix Spike

Sample NFS-PDI-CC12BR-10.5-11.0 (JC31705-3A) was analyzed as a matrix spike/matrix spike duplicate (MS/MSD) in this SDG.

The MS/MSD recoveries (%R) for antimony were below the QC limits; therefore, antimony was qualified as estimated (UJ) in sample NFS-PDI-CC12BR-10.5-11.0 with a possible low bias.

The MS/MSD %R of aluminum, manganese and potassium exceeded the QC limits in the MS/MSD; therefore, aluminum, manganese and potassium were estimated (J) in the parent sample with a possible high bias.

Field Duplicates

Sample NFS-PDI-CC12BR-6.5-7.0X (JC31705-13A) was collected as a field duplicate of sample NFS-PDI-CC12BR-6.5-7.0 (JC31705-12A) from this site. The relative percent difference (RPD) between the parent sample result and the field duplicate result for chromium did not meet QC criteria of less than 35%; therefore, the results for chromium in the field duplicate pair were qualified (J) as estimated with unknown direction of bias due to poor field duplicate precision.

Sample results qualified for poor field duplicate precision are presented in the Metal Soil Target Analyte Summary Hit List in Attachment A and in the nonconformance table in Attachment B.

Sample Results

Reported results (flagged B by the laboratory) that were less than the RL, but greater than or equal to the method detection limit (MDL), are approximate values and have been qualified as estimated (J).

VOCs

Field Duplicates

Sample NFS-PDI-CC12BR-6.5-7.0X (JC31705-13A) was collected as a field duplicate of sample NFS-PDI-CC12BR-6.5-7.0 (JC31705-12A) from this site. The relative percent difference (RPD) between the parent sample result and the field duplicate result for 1,4-dichlorobenzene, chlorobenzene, m-dichlorobenzene, acetone and 1,2-dichlorobenzene did not meet QC criteria of less than 50%; therefore, the results for these compounds in the field duplicate pair were qualified (J) as estimated with unknown direction of bias due to poor field duplicate precision.

Sample Results

Reported results (flagged J by the laboratory) that were less than the RL, but greater than or equal to the MDL, are approximate values and have been qualified as estimated (J).

SVOCs

Surrogates

The recoveries of surrogates 2,4,6-tribromophenol and 2-fluorobiphenyl in sample NFS-FB20161114 (JC31705-1A) were below the laboratory QC limits. The sample was re-extracted out of hold time to verify the sample results. There are four other surrogates present in the SVOC fraction that met QC criteria. Based on professional judgement no qualifications were made.

Sample Results

Reported results (flagged J by the laboratory), that were less than the RL, but greater than or equal to the MDL are approximate values and have been qualified as estimated (J).

Data Quality and Usability

The following issues were noted for this sample set:

- Beryllium was estimated (JB) in sample NFS-PDI-CC12BR-18.5-19.0 (JC31705-7A) due to MB contamination.
- Sodium was estimated (JB) in all of the soil samples with the exception of sample NFS-PDI-CC12BR-16.5-17.0 (JC31705-6A) due to method blank contamination.
- Mercury was estimated (JB) in samples NFS-PDI-CC12BR-6.5-7.0 (JC31705-12A) and NFS-PDI-CC12BR-6.5-7.0X (JC31705-13A). In addition, Mercury was negated (UB) at the RL in samples NFS-PDI-CC12BR-10.5-11.0 (JC31705-3A), NFS-PDI-CC12BR-14.5-15.0 (JC31705-5A), NFS-PDI-CC12BR-16.5-17.0 (JC31705-6A), NFS-PDI-CC12BR-18.5-19.0 (JC31705-7A), NFS-PDI-CC12BR-20.0-20.5 (JC31705-9A) and NFS-PDI-CC12BR-8.5-9.0 (JC31705-14A) due to method blank contamination.
- The result for antimony in sample NFS-PDI-CC12BR-10.5-11.0 (JC31705-3A) was estimated with a possible low bias due to low MS/MSD recovery; the results for aluminum, manganese and potassium were estimated (J) in this sample with a possible high bias due to high MS/MSD recoveries.
- The results for chromium in the field duplicate pair NFS-PDI-CC12BR-6.5-7.0/ NFS-PDI-CC12BR-6.5-7.0X were qualified (J) as estimated with unknown direction of bias due to poor field duplicate precision.
- The results for 1,4-dichlorobenzene, chlorobenzene, m-dichlorobenzene, acetone and 1,2-dichlorobenzene in the field duplicate pair NFS-PDI-CC12BR-6.5-7.0 (JC31705-12A) and NFS-PDI-CC12BR-6.5-7.0X (JC31705-13A) were estimated (J) based on RPD values greater than 50%.
- Sample results reported between the MDL and RL were estimated with an unknown directional bias.

ATTACHMENTS

Attachment A: Target Analyte Summary Hit List(s)

Attachment B: Data Validation Report Form

Attachment A

Target Analyte Summary Hit List(s)

Soil Target Analyte Summary Hit List (TAL Metals)

Site Name PPG - North Forest Street PDI
Sampling Date November 14, 2016
Lab Name/ID SGS/Accutest, Dayton, NJ
SDG No JC31705A
Sample Matrix Soil
Trip Blank ID NA
Field Blank ID NFS-FB20161114

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
NFS-PDI-CC12BR-0.5-1.0	JC31705-2A	ALUMINUM	U	5790	5790	57		
NFS-PDI-CC12BR-0.5-1.0	JC31705-2A	ANTIMONY	U	1.2B	1.2	2.3	Qualify	6
NFS-PDI-CC12BR-0.5-1.0	JC31705-2A	ARSENIC	U	30.7	30.7	2.3		
NFS-PDI-CC12BR-0.5-1.0	JC31705-2A	BARIUM	U	86.4	86.4	23		
NFS-PDI-CC12BR-0.5-1.0	JC31705-2A	BERYLLIUM	U	0.62	0.62	0.23		
NFS-PDI-CC12BR-0.5-1.0	JC31705-2A	CADMIUM	U	0.24B	0.24	0.57	Qualify	6
NFS-PDI-CC12BR-0.5-1.0	JC31705-2A	CALCIUM METAL	U	5740	5740	570		
NFS-PDI-CC12BR-0.5-1.0	JC31705-2A	CHROMIUM	U	17.2	17.2	1.1		
NFS-PDI-CC12BR-0.5-1.0	JC31705-2A	COBALT	U	13.8	13.8	5.7		
NFS-PDI-CC12BR-0.5-1.0	JC31705-2A	COPPER	U	55.8	55.8	2.9		
NFS-PDI-CC12BR-0.5-1.0	JC31705-2A	IRON	U	21100	21100	57		
NFS-PDI-CC12BR-0.5-1.0	JC31705-2A	LEAD	U	74.3	74.3	2.3		
NFS-PDI-CC12BR-0.5-1.0	JC31705-2A	MAGNESIUM	U	1680	1680	570		
NFS-PDI-CC12BR-0.5-1.0	JC31705-2A	MANGANESE	U	560	560	1.7		
NFS-PDI-CC12BR-0.5-1.0	JC31705-2A	NICKEL	U	15.8	15.8	4.6		
NFS-PDI-CC12BR-0.5-1.0	JC31705-2A	POTASSIUM	U	835B	835	1100	Qualify	6
NFS-PDI-CC12BR-0.5-1.0	JC31705-2A	SELENIUM	U	1.2B	1.2	2.3	Qualify	6

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
NFS-PDI-CC12BR-0.5-1.0	JC31705-2A	SILVER	U	1.2	1.2	0.57		
NFS-PDI-CC12BR-0.5-1.0	JC31705-2A	SODIUM	U	187B	187	1100	Qualify	1,6
NFS-PDI-CC12BR-0.5-1.0	JC31705-2A	VANADIUM	U	27.2	27.2	5.7		
NFS-PDI-CC12BR-0.5-1.0	JC31705-2A	ZINC	U	790	790	5.7		
NFS-PDI-CC12BR-10.5-11.0	JC31705-3A	ALUMINUM	U	8780	8780	58	Qualify	3
NFS-PDI-CC12BR-10.5-11.0	JC31705-3A	ANTIMONY	U	U	U	2.3	Qualify	4
NFS-PDI-CC12BR-10.5-11.0	JC31705-3A	ARSENIC	U	4.2	4.2	2.3		
NFS-PDI-CC12BR-10.5-11.0	JC31705-3A	BARIUM	U	56.8	56.8	23		
NFS-PDI-CC12BR-10.5-11.0	JC31705-3A	BERYLLIUM	U	0.55	0.55	0.23		
NFS-PDI-CC12BR-10.5-11.0	JC31705-3A	CALCIUM METAL	U	1430	1430	580		
NFS-PDI-CC12BR-10.5-11.0	JC31705-3A	CHROMIUM	U	87.2	87.2	1.2		
NFS-PDI-CC12BR-10.5-11.0	JC31705-3A	COBALT	U	6.2	6.2	5.8		
NFS-PDI-CC12BR-10.5-11.0	JC31705-3A	COPPER	U	11.5	11.5	2.9		
NFS-PDI-CC12BR-10.5-11.0	JC31705-3A	IRON	U	14300	14300	58		
NFS-PDI-CC12BR-10.5-11.0	JC31705-3A	LEAD	U	9.6	9.6	2.3		
NFS-PDI-CC12BR-10.5-11.0	JC31705-3A	MAGNESIUM	U	2560	2560	580		
NFS-PDI-CC12BR-10.5-11.0	JC31705-3A	MANGANESE	U	509	509	1.8	Qualify	3
NFS-PDI-CC12BR-10.5-11.0	JC31705-3A	NICKEL	U	11.8	11.8	4.7		
NFS-PDI-CC12BR-10.5-11.0	JC31705-3A	POTASSIUM	U	1280	1280	1200	Qualify	3
NFS-PDI-CC12BR-10.5-11.0	JC31705-3A	SILVER	U	0.28B	0.28	0.58	Qualify	6
NFS-PDI-CC12BR-10.5-11.0	JC31705-3A	SODIUM	U	203B	203	1200	Qualify	1,6
NFS-PDI-CC12BR-10.5-11.0	JC31705-3A	VANADIUM	U	23.5	23.5	5.8		
NFS-PDI-CC12BR-10.5-11.0	JC31705-3A	ZINC	U	35.0	35.0	5.8		
NFS-PDI-CC12BR-12.5-13.0	JC31705-4A	ALUMINUM	U	4800	4800	49		
NFS-PDI-CC12BR-12.5-13.0	JC31705-4A	ARSENIC	U	3.2	3.2	2.0		

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
NFS-PDI-CC12BR-12.5-13.0	JC31705-4A	BARIUM	U	23.7	23.7	20		
NFS-PDI-CC12BR-12.5-13.0	JC31705-4A	BERYLLIUM	U	0.38	0.38	0.20		
NFS-PDI-CC12BR-12.5-13.0	JC31705-4A	CALCIUM METAL	U	1410	1410	490		
NFS-PDI-CC12BR-12.5-13.0	JC31705-4A	CHROMIUM	U	43.6	43.6	0.98		
NFS-PDI-CC12BR-12.5-13.0	JC31705-4A	COBALT	U	2.9B	2.9	4.9	Qualify	6
NFS-PDI-CC12BR-12.5-13.0	JC31705-4A	COPPER	U	6.0	6.0	2.4		
NFS-PDI-CC12BR-12.5-13.0	JC31705-4A	IRON	U	8480	8480	49		
NFS-PDI-CC12BR-12.5-13.0	JC31705-4A	LEAD	U	7.6	7.6	2.0		
NFS-PDI-CC12BR-12.5-13.0	JC31705-4A	MAGNESIUM	U	1340	1340	490		
NFS-PDI-CC12BR-12.5-13.0	JC31705-4A	MANGANESE	U	186	186	1.5		
NFS-PDI-CC12BR-12.5-13.0	JC31705-4A	NICKEL	U	5.6	5.6	3.9		
NFS-PDI-CC12BR-12.5-13.0	JC31705-4A	POTASSIUM	U	811B	811	980	Qualify	6
NFS-PDI-CC12BR-12.5-13.0	JC31705-4A	SODIUM	U	134B	134	980	Qualify	1,6
NFS-PDI-CC12BR-12.5-13.0	JC31705-4A	VANADIUM	U	15.1	15.1	4.9		
NFS-PDI-CC12BR-12.5-13.0	JC31705-4A	ZINC	U	21.3	21.3	4.9		
NFS-PDI-CC12BR-14.5-15.0	JC31705-5A	ALUMINUM	U	5860	5860	49		
NFS-PDI-CC12BR-14.5-15.0	JC31705-5A	ARSENIC	U	3.5	3.5	2.0		
NFS-PDI-CC12BR-14.5-15.0	JC31705-5A	BARIUM	U	46.2	46.2	20		
NFS-PDI-CC12BR-14.5-15.0	JC31705-5A	BERYLLIUM	U	0.48	0.48	0.20		
NFS-PDI-CC12BR-14.5-15.0	JC31705-5A	CALCIUM METAL	U	1530	1530	490		
NFS-PDI-CC12BR-14.5-15.0	JC31705-5A	CHROMIUM	U	87.4	87.4	0.98		
NFS-PDI-CC12BR-14.5-15.0	JC31705-5A	COBALT	U	3.8B	3.8	4.9	Qualify	6
NFS-PDI-CC12BR-14.5-15.0	JC31705-5A	COPPER	U	10.1	10.1	2.5		
NFS-PDI-CC12BR-14.5-15.0	JC31705-5A	IRON	U	10100	10100	49		
NFS-PDI-CC12BR-14.5-15.0	JC31705-5A	LEAD	U	10.7	10.7	2.0		

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
NFS-PDI-CC12BR-14.5-15.0	JC31705-5A	MAGNESIUM	U	2120	2120	490		
NFS-PDI-CC12BR-14.5-15.0	JC31705-5A	MANGANESE	U	195	195	1.5		
NFS-PDI-CC12BR-14.5-15.0	JC31705-5A	NICKEL	U	8.1	8.1	3.9		
NFS-PDI-CC12BR-14.5-15.0	JC31705-5A	POTASSIUM	U	1060	1060	980		
NFS-PDI-CC12BR-14.5-15.0	JC31705-5A	SILVER	U	0.13B	0.13	0.49	Qualify	6
NFS-PDI-CC12BR-14.5-15.0	JC31705-5A	SODIUM	U	166B	166	980	Qualify	1,6
NFS-PDI-CC12BR-14.5-15.0	JC31705-5A	VANADIUM	U	18.5	18.5	4.9		
NFS-PDI-CC12BR-14.5-15.0	JC31705-5A	ZINC	U	42.0	42.0	4.9		
NFS-PDI-CC12BR-16.5-17.0	JC31705-6A	ALUMINUM	U	7250	7250	45		
NFS-PDI-CC12BR-16.5-17.0	JC31705-6A	ARSENIC	U	5.1	5.1	1.8		
NFS-PDI-CC12BR-16.5-17.0	JC31705-6A	BARIUM	U	61.9	61.9	18		
NFS-PDI-CC12BR-16.5-17.0	JC31705-6A	BERYLLIUM	U	0.47	0.47	0.18		
NFS-PDI-CC12BR-16.5-17.0	JC31705-6A	CADMIUM	U	0.064B	0.064	0.45	Qualify	6
NFS-PDI-CC12BR-16.5-17.0	JC31705-6A	CALCIUM METAL	U	2200	2200	450		
NFS-PDI-CC12BR-16.5-17.0	JC31705-6A	CHROMIUM	U	71.9	71.9	0.91		
NFS-PDI-CC12BR-16.5-17.0	JC31705-6A	COBALT	U	6.2	6.2	4.5		
NFS-PDI-CC12BR-16.5-17.0	JC31705-6A	COPPER	U	15.6	15.6	2.3		
NFS-PDI-CC12BR-16.5-17.0	JC31705-6A	IRON	U	13000	13000	45		
NFS-PDI-CC12BR-16.5-17.0	JC31705-6A	LEAD	U	14.0	14.0	1.8		
NFS-PDI-CC12BR-16.5-17.0	JC31705-6A	MAGNESIUM	U	3500	3500	450		
NFS-PDI-CC12BR-16.5-17.0	JC31705-6A	MANGANESE	U	338	338	1.4		
NFS-PDI-CC12BR-16.5-17.0	JC31705-6A	NICKEL	U	11.8	11.8	3.6		
NFS-PDI-CC12BR-16.5-17.0	JC31705-6A	POTASSIUM	U	1540	1540	910		
NFS-PDI-CC12BR-16.5-17.0	JC31705-6A	SODIUM	U	242B	242	910	Qualify	6
NFS-PDI-CC12BR-16.5-17.0	JC31705-6A	VANADIUM	U	27.6	27.6	4.5		

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
NFS-PDI-CC12BR-16.5-17.0	JC31705-6A	ZINC	U	64.5	64.5	4.5		
NFS-PDI-CC12BR-18.5-19.0	JC31705-7A	ALUMINUM	U	3000	3000	60		
NFS-PDI-CC12BR-18.5-19.0	JC31705-7A	ARSENIC	U	3.1	3.1	2.4		
NFS-PDI-CC12BR-18.5-19.0	JC31705-7A	BARIUM	U	159	159	24		
NFS-PDI-CC12BR-18.5-19.0	JC31705-7A	BERYLLIUM	U	0.25	0.25	0.24	Qualify	1
NFS-PDI-CC12BR-18.5-19.0	JC31705-7A	CADMIUM	U	0.29B	0.29	0.60	Qualify	6
NFS-PDI-CC12BR-18.5-19.0	JC31705-7A	CALCIUM METAL	U	1490	1490	600		
NFS-PDI-CC12BR-18.5-19.0	JC31705-7A	CHROMIUM	U	63.1	63.1	1.2		
NFS-PDI-CC12BR-18.5-19.0	JC31705-7A	COBALT	U	2.9B	2.9	6.0	Qualify	6
NFS-PDI-CC12BR-18.5-19.0	JC31705-7A	COPPER	U	7.2	7.2	3.0		
NFS-PDI-CC12BR-18.5-19.0	JC31705-7A	IRON	U	7390	7390	60		
NFS-PDI-CC12BR-18.5-19.0	JC31705-7A	LEAD	U	9.4	9.4	2.4		
NFS-PDI-CC12BR-18.5-19.0	JC31705-7A	MAGNESIUM	U	1170	1170	600		
NFS-PDI-CC12BR-18.5-19.0	JC31705-7A	MANGANESE	U	1770	1770	3.6		
NFS-PDI-CC12BR-18.5-19.0	JC31705-7A	NICKEL	U	13.5	13.5	4.8		
NFS-PDI-CC12BR-18.5-19.0	JC31705-7A	POTASSIUM	U	567B	567	1200	Qualify	6
NFS-PDI-CC12BR-18.5-19.0	JC31705-7A	SILVER	U	0.13B	0.13	0.60	Qualify	6
NFS-PDI-CC12BR-18.5-19.0	JC31705-7A	SODIUM	U	128B	128	1200	Qualify	1,6
NFS-PDI-CC12BR-18.5-19.0	JC31705-7A	VANADIUM	U	12.8	12.8	6.0		
NFS-PDI-CC12BR-18.5-19.0	JC31705-7A	ZINC	U	40.7	40.7	6.0		
NFS-PDI-CC12BR-2.5-3.0	JC31705-8A	ALUMINUM	U	10300	10300	54		
NFS-PDI-CC12BR-2.5-3.0	JC31705-8A	ANTIMONY	U	1.1B	1.1	2.2	Qualify	6
NFS-PDI-CC12BR-2.5-3.0	JC31705-8A	ARSENIC	U	6.1	6.1	2.2		
NFS-PDI-CC12BR-2.5-3.0	JC31705-8A	BARIUM	U	73.4	73.4	22		
NFS-PDI-CC12BR-2.5-3.0	JC31705-8A	BERYLLIUM	U	0.63	0.63	0.22		

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
NFS-PDI-CC12BR-2.5-3.0	JC31705-8A	CADMIUM	U	0.76	0.76	0.54		
NFS-PDI-CC12BR-2.5-3.0	JC31705-8A	CALCIUM METAL	U	6790	6790	540		
NFS-PDI-CC12BR-2.5-3.0	JC31705-8A	CHROMIUM	U	15.5	15.5	1.1		
NFS-PDI-CC12BR-2.5-3.0	JC31705-8A	COBALT	U	7.0	7.0	5.4		
NFS-PDI-CC12BR-2.5-3.0	JC31705-8A	COPPER	U	50.3	50.3	2.7		
NFS-PDI-CC12BR-2.5-3.0	JC31705-8A	IRON	U	19300	19300	54		
NFS-PDI-CC12BR-2.5-3.0	JC31705-8A	LEAD	U	154	154	2.2		
NFS-PDI-CC12BR-2.5-3.0	JC31705-8A	MAGNESIUM	U	2890	2890	540		
NFS-PDI-CC12BR-2.5-3.0	JC31705-8A	MANGANESE	U	498	498	1.6		
NFS-PDI-CC12BR-2.5-3.0	JC31705-8A	NICKEL	U	14.7	14.7	4.3		
NFS-PDI-CC12BR-2.5-3.0	JC31705-8A	POTASSIUM	U	1160	1160	1100		
NFS-PDI-CC12BR-2.5-3.0	JC31705-8A	SELENIUM	U	0.62B	0.62	2.2	Qualify	6
NFS-PDI-CC12BR-2.5-3.0	JC31705-8A	SILVER	U	0.25B	0.25	0.54	Qualify	6
NFS-PDI-CC12BR-2.5-3.0	JC31705-8A	SODIUM	U	173B	173	1100	Qualify	1,6
NFS-PDI-CC12BR-2.5-3.0	JC31705-8A	VANADIUM	U	22.3	22.3	5.4		
NFS-PDI-CC12BR-2.5-3.0	JC31705-8A	ZINC	U	558	558	5.4		
NFS-PDI-CC12BR-20.0-20.5	JC31705-9A	ALUMINUM	U	2490	2490	57		
NFS-PDI-CC12BR-20.0-20.5	JC31705-9A	ARSENIC	U	5.4	5.4	2.3		
NFS-PDI-CC12BR-20.0-20.5	JC31705-9A	BARIUM	U	15.7B	15.7	23	Qualify	6
NFS-PDI-CC12BR-20.0-20.5	JC31705-9A	BERYLLIUM	U	0.39	0.39	0.23		
NFS-PDI-CC12BR-20.0-20.5	JC31705-9A	CADMIUM	U	0.069B	0.069	0.57	Qualify	6
NFS-PDI-CC12BR-20.0-20.5	JC31705-9A	CALCIUM METAL	U	1310	1310	570		
NFS-PDI-CC12BR-20.0-20.5	JC31705-9A	CHROMIUM	U	65.5	65.5	1.1		
NFS-PDI-CC12BR-20.0-20.5	JC31705-9A	COBALT	U	2.6B	2.6	5.7	Qualify	6
NFS-PDI-CC12BR-20.0-20.5	JC31705-9A	COPPER	U	6.4	6.4	2.9		

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
NFS-PDI-CC12BR-20.0-20.5	JC31705-9A	IRON	U	8850	8850	57		
NFS-PDI-CC12BR-20.0-20.5	JC31705-9A	LEAD	U	9.6	9.6	2.3		
NFS-PDI-CC12BR-20.0-20.5	JC31705-9A	MAGNESIUM	U	1240	1240	570		
NFS-PDI-CC12BR-20.0-20.5	JC31705-9A	MANGANESE	U	117	117	1.7		
NFS-PDI-CC12BR-20.0-20.5	JC31705-9A	NICKEL	U	4.3B	4.3	4.6	Qualify	6
NFS-PDI-CC12BR-20.0-20.5	JC31705-9A	POTASSIUM	U	462B	462	1100	Qualify	6
NFS-PDI-CC12BR-20.0-20.5	JC31705-9A	SODIUM	U	112B	112	1100	Qualify	1,6
NFS-PDI-CC12BR-20.0-20.5	JC31705-9A	VANADIUM	U	14.3	14.3	5.7		
NFS-PDI-CC12BR-20.0-20.5	JC31705-9A	ZINC	U	26.4	26.4	5.7		
NFS-PDI-CC12BR-4.5-5.0	JC31705-10A	ALUMINUM	U	9300	9300	50		
NFS-PDI-CC12BR-4.5-5.0	JC31705-10A	ANTIMONY	U	1.1B	1.1	2.0	Qualify	6
NFS-PDI-CC12BR-4.5-5.0	JC31705-10A	ARSENIC	U	8.5	8.5	2.0		
NFS-PDI-CC12BR-4.5-5.0	JC31705-10A	BARIUM	U	65.8	65.8	20		
NFS-PDI-CC12BR-4.5-5.0	JC31705-10A	BERYLLIUM	U	0.69	0.69	0.20		
NFS-PDI-CC12BR-4.5-5.0	JC31705-10A	CADMIUM	U	0.45B	0.45	0.50	Qualify	6
NFS-PDI-CC12BR-4.5-5.0	JC31705-10A	CALCIUM METAL	U	4940	4940	500		
NFS-PDI-CC12BR-4.5-5.0	JC31705-10A	CHROMIUM	U	16.7	16.7	0.99		
NFS-PDI-CC12BR-4.5-5.0	JC31705-10A	COBALT	U	13.5	13.5	5.0		
NFS-PDI-CC12BR-4.5-5.0	JC31705-10A	COPPER	U	63.0	63.0	2.5		
NFS-PDI-CC12BR-4.5-5.0	JC31705-10A	IRON	U	18000	18000	50		
NFS-PDI-CC12BR-4.5-5.0	JC31705-10A	LEAD	U	126	126	2.0		
NFS-PDI-CC12BR-4.5-5.0	JC31705-10A	MAGNESIUM	U	2880	2880	500		
NFS-PDI-CC12BR-4.5-5.0	JC31705-10A	MANGANESE	U	314	314	1.5		
NFS-PDI-CC12BR-4.5-5.0	JC31705-10A	NICKEL	U	14.3	14.3	4.0		
NFS-PDI-CC12BR-4.5-5.0	JC31705-10A	POTASSIUM	U	1200	1200	990		

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
NFS-PDI-CC12BR-4.5-5.0	JC31705-10A	SILVER	U	0.99	0.99	0.50		
NFS-PDI-CC12BR-4.5-5.0	JC31705-10A	SODIUM	U	151B	151	990	Qualify	1,6
NFS-PDI-CC12BR-4.5-5.0	JC31705-10A	VANADIUM	U	24.9	24.9	5.0		
NFS-PDI-CC12BR-4.5-5.0	JC31705-10A	ZINC	U	343	343	5.0		
NFS-PDI-CC12BR-5.0-5.5	JC31705-11A	ALUMINUM	U	14900	14900	50		
NFS-PDI-CC12BR-5.0-5.5	JC31705-11A	ANTIMONY	U	0.70B	0.70	2.0	Qualify	6
NFS-PDI-CC12BR-5.0-5.5	JC31705-11A	ARSENIC	U	4.1	4.1	2.0		
NFS-PDI-CC12BR-5.0-5.5	JC31705-11A	BARIUM	U	38.1	38.1	20		
NFS-PDI-CC12BR-5.0-5.5	JC31705-11A	BERYLLIUM	U	0.56	0.56	0.20		
NFS-PDI-CC12BR-5.0-5.5	JC31705-11A	CADMIUM	U	0.13B	0.13	0.50	Qualify	6
NFS-PDI-CC12BR-5.0-5.5	JC31705-11A	CALCIUM METAL	U	902	902	500		
NFS-PDI-CC12BR-5.0-5.5	JC31705-11A	CHROMIUM	U	17.2	17.2	1.0		
NFS-PDI-CC12BR-5.0-5.5	JC31705-11A	COBALT	U	10.1	10.1	5.0		
NFS-PDI-CC12BR-5.0-5.5	JC31705-11A	COPPER	U	24.2	24.2	2.5		
NFS-PDI-CC12BR-5.0-5.5	JC31705-11A	IRON	U	21300	21300	50		
NFS-PDI-CC12BR-5.0-5.5	JC31705-11A	LEAD	U	11.6	11.6	2.0		
NFS-PDI-CC12BR-5.0-5.5	JC31705-11A	MAGNESIUM	U	4050	4050	500		
NFS-PDI-CC12BR-5.0-5.5	JC31705-11A	MANGANESE	U	424	424	1.5		
NFS-PDI-CC12BR-5.0-5.5	JC31705-11A	NICKEL	U	18.6	18.6	4.0		
NFS-PDI-CC12BR-5.0-5.5	JC31705-11A	POTASSIUM	U	1130	1130	1000		
NFS-PDI-CC12BR-5.0-5.5	JC31705-11A	SILVER	U	0.13B	0.13	0.50	Qualify	6
NFS-PDI-CC12BR-5.0-5.5	JC31705-11A	SODIUM	U	163B	163	1000	Qualify	1,6
NFS-PDI-CC12BR-5.0-5.5	JC31705-11A	VANADIUM	U	23.5	23.5	5.0		
NFS-PDI-CC12BR-5.0-5.5	JC31705-11A	ZINC	U	60.8	60.8	5.0		
NFS-PDI-CC12BR-6.5-7.0	JC31705-12A	ALUMINUM	U	13800	13800	50		

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
NFS-PDI-CC12BR-6.5-7.0	JC31705-12A	ANTIMONY	U	0.75B	0.75	2.0	Qualify	6
NFS-PDI-CC12BR-6.5-7.0	JC31705-12A	ARSENIC	U	6.1	6.1	2.0		
NFS-PDI-CC12BR-6.5-7.0	JC31705-12A	BARIUM	U	44.0	44.0	20		
NFS-PDI-CC12BR-6.5-7.0	JC31705-12A	BERYLLIUM	U	0.54	0.54	0.20		
NFS-PDI-CC12BR-6.5-7.0	JC31705-12A	CADMIUM	U	0.14B	0.14	0.50	Qualify	6
NFS-PDI-CC12BR-6.5-7.0	JC31705-12A	CALCIUM METAL	U	1030	1030	500		
NFS-PDI-CC12BR-6.5-7.0	JC31705-12A	CHROMIUM	U	164	164	1.0	Qualify	5
NFS-PDI-CC12BR-6.5-7.0	JC31705-12A	COBALT	U	11.3	11.3	5.0		
NFS-PDI-CC12BR-6.5-7.0	JC31705-12A	COPPER	U	21.4	21.4	2.5		
NFS-PDI-CC12BR-6.5-7.0	JC31705-12A	IRON	U	24900	24900	50		
NFS-PDI-CC12BR-6.5-7.0	JC31705-12A	LEAD	U	10.8	10.8	2.0		
NFS-PDI-CC12BR-6.5-7.0	JC31705-12A	MAGNESIUM	U	4000	4000	500		
NFS-PDI-CC12BR-6.5-7.0	JC31705-12A	MANGANESE	U	624	624	1.5		
NFS-PDI-CC12BR-6.5-7.0	JC31705-12A	NICKEL	U	16.9	16.9	4.0		
NFS-PDI-CC12BR-6.5-7.0	JC31705-12A	POTASSIUM	U	894B	894	1000	Qualify	6
NFS-PDI-CC12BR-6.5-7.0	JC31705-12A	SILVER	U	0.20B	0.20	0.50	Qualify	6
NFS-PDI-CC12BR-6.5-7.0	JC31705-12A	SODIUM	U	233B	233	1000	Qualify	1,6
NFS-PDI-CC12BR-6.5-7.0	JC31705-12A	VANADIUM	U	26.6	26.6	5.0		
NFS-PDI-CC12BR-6.5-7.0	JC31705-12A	ZINC	U	50.9	50.9	5.0		
NFS-PDI-CC12BR-6.5-7.0X	JC31705-13A	ALUMINUM	U	12600	12600	48		
NFS-PDI-CC12BR-6.5-7.0X	JC31705-13A	ANTIMONY	U	0.71B	0.71	1.9	Qualify	6
NFS-PDI-CC12BR-6.5-7.0X	JC31705-13A	ARSENIC	U	5.1	5.1	1.9		
NFS-PDI-CC12BR-6.5-7.0X	JC31705-13A	BARIUM	U	35.5	35.5	19		
NFS-PDI-CC12BR-6.5-7.0X	JC31705-13A	BERYLLIUM	U	0.55	0.55	0.19		
NFS-PDI-CC12BR-6.5-7.0X	JC31705-13A	CADMIUM	U	0.14B	0.14	0.48	Qualify	6

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
NFS-PDI-CC12BR-6.5-7.0X	JC31705-13A	CALCIUM METAL	U	900	900	480		
NFS-PDI-CC12BR-6.5-7.0X	JC31705-13A	CHROMIUM	U	73.2	73.2	0.96	Qualify	5
NFS-PDI-CC12BR-6.5-7.0X	JC31705-13A	COBALT	U	10.8	10.8	4.8		
NFS-PDI-CC12BR-6.5-7.0X	JC31705-13A	COPPER	U	23.9	23.9	2.4		
NFS-PDI-CC12BR-6.5-7.0X	JC31705-13A	IRON	U	22200	22200	48		
NFS-PDI-CC12BR-6.5-7.0X	JC31705-13A	LEAD	U	11.2	11.2	1.9		
NFS-PDI-CC12BR-6.5-7.0X	JC31705-13A	MAGNESIUM	U	3950	3950	480		
NFS-PDI-CC12BR-6.5-7.0X	JC31705-13A	MANGANESE	U	549	549	1.4		
NFS-PDI-CC12BR-6.5-7.0X	JC31705-13A	NICKEL	U	16.9	16.9	3.8		
NFS-PDI-CC12BR-6.5-7.0X	JC31705-13A	POTASSIUM	U	943B	943	960	Qualify	6
NFS-PDI-CC12BR-6.5-7.0X	JC31705-13A	SILVER	U	0.18B	0.18	0.48	Qualify	6
NFS-PDI-CC12BR-6.5-7.0X	JC31705-13A	SODIUM	U	203B	203	960	Qualify	1,6
NFS-PDI-CC12BR-6.5-7.0X	JC31705-13A	VANADIUM	U	22.2	22.2	4.8		
NFS-PDI-CC12BR-6.5-7.0X	JC31705-13A	ZINC	U	56.9	56.9	4.8		
NFS-PDI-CC12BR-8.5-9.0	JC31705-14A	ALUMINUM	U	12900	12900	57		
NFS-PDI-CC12BR-8.5-9.0	JC31705-14A	ANTIMONY	U	0.87B	0.87	2.3	Qualify	6
NFS-PDI-CC12BR-8.5-9.0	JC31705-14A	ARSENIC	U	6.9	6.9	2.3		
NFS-PDI-CC12BR-8.5-9.0	JC31705-14A	BARIUM	U	54.0	54.0	23		
NFS-PDI-CC12BR-8.5-9.0	JC31705-14A	BERYLLIUM	U	0.79	0.79	0.23		
NFS-PDI-CC12BR-8.5-9.0	JC31705-14A	CADMIUM	U	0.13B	0.13	0.57	Qualify	6
NFS-PDI-CC12BR-8.5-9.0	JC31705-14A	CALCIUM METAL	U	1260	1260	570		
NFS-PDI-CC12BR-8.5-9.0	JC31705-14A	CHROMIUM	U	222	222	1.1		
NFS-PDI-CC12BR-8.5-9.0	JC31705-14A	COBALT	U	8.1	8.1	5.7		
NFS-PDI-CC12BR-8.5-9.0	JC31705-14A	COPPER	U	13.6	13.6	2.9		
NFS-PDI-CC12BR-8.5-9.0	JC31705-14A	IRON	U	25600	25600	57		

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
NFS-PDI-CC12BR-8.5-9.0	JC31705-14A	LEAD	U	10.9	10.9	2.3		
NFS-PDI-CC12BR-8.5-9.0	JC31705-14A	MAGNESIUM	U	2900	2900	570		
NFS-PDI-CC12BR-8.5-9.0	JC31705-14A	MANGANESE	U	460	460	1.7		
NFS-PDI-CC12BR-8.5-9.0	JC31705-14A	NICKEL	U	12.8	12.8	4.6		
NFS-PDI-CC12BR-8.5-9.0	JC31705-14A	POTASSIUM	U	848B	848	1100	Qualify	6
NFS-PDI-CC12BR-8.5-9.0	JC31705-14A	SILVER	U	0.30B	0.30	0.57	Qualify	6
NFS-PDI-CC12BR-8.5-9.0	JC31705-14A	SODIUM	U	218B	218	1100	Qualify	1,6
NFS-PDI-CC12BR-8.5-9.0	JC31705-14A	VANADIUM	U	33.0	33.0	5.7		
NFS-PDI-CC12BR-8.5-9.0	JC31705-14A	ZINC	U	34.4	34.4	5.7		
NFS-PDI-CC12BR-0.5-1.0	JC31705-2A	MERCURY	U	0.16	0.16	0.037		
NFS-PDI-CC12BR-10.5-11.0	JC31705-3A	MERCURY	U	0.019B	UB	0.037	Negate	2
NFS-PDI-CC12BR-14.5-15.0	JC31705-5A	MERCURY	U	0.012B	UB	0.036	Negate	2
NFS-PDI-CC12BR-16.5-17.0	JC31705-6A	MERCURY	U	0.013B	UB	0.036	Negate	2
NFS-PDI-CC12BR-18.5-19.0	JC31705-7A	MERCURY	U	0.016B	UB	0.038	Negate	2
NFS-PDI-CC12BR-2.5-3.0	JC31705-8A	MERCURY	U	0.72	0.72	0.034		
NFS-PDI-CC12BR-20.0-20.5	JC31705-9A	MERCURY	U	0.0089B	UB	0.036	Negate	2
NFS-PDI-CC12BR-4.5-5.0	JC31705-10A	MERCURY	U	0.74	0.74	0.033		
NFS-PDI-CC12BR-5.0-5.5	JC31705-11A	MERCURY	U	0.13	0.13	0.033		
NFS-PDI-CC12BR-6.5-7.0	JC31705-12A	MERCURY	U	0.033	0.033	0.033	Qualify	1
NFS-PDI-CC12BR-6.5-7.0X	JC31705-13A	MERCURY	U	0.036	0.036	0.034	Qualify	1
NFS-PDI-CC12BR-8.5-9.0	JC31705-14A	MERCURY	U	0.019B	UB	0.038	Negate	2

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

NJDEP Laboratory Footnote

1. The value reported is greater than three (3) times but less than ten (10) times the value in the preparation/reagent blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to the preparation/reagent blank contamination. The "B" qualifier alerts the end-user to the presence of this analyte in the preparation/reagent blank.
2. The value reported is less than or equal to 3x the value in the preparation/reagent blank. It is the policy of NJDEP-DPF SR to negate the reported value due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.
3. The reported value was qualified because the MS/MSD spike recovery was greater than 125% for metals.
4. The reported value was qualified because the MS/MSD spike recovery was less than 75% for metals.
5. The reported value was qualified due to poor field duplicate precision with unknown direction of bias.
6. The reported result was greater than the MDL but less than the RL and therefore was estimated.

Aqueous Target Analyte Summary Hit List (TAL Metals)

Site Name PPG - North Forest Street PDI
Sampling Date November 14, 2016
Lab Name/ID SGS/Accutest, Dayton, NJ
SDG No JC31705A
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID NFS-FB20161114

Field Sample ID	Lab Sample ID	Analyte	Method Blank (ug/L)	Laboratory Sample Result (ug/L)	Validation Sample Result (ug/L)	RL (ug/L)	Quality Assurance Decision	NJDEP Validation Footnote
NFS-FB20161114	JC31705-1A	BARIUM	U	0.70B	0.70	200	Qualify	1
NFS-FB20161114	JC31705-1A	SODIUM	U	84.9B	84.9	10000	Qualify	1
NFS-FB20161114	JC31705-1A	ZINC	U	2.5B	2.5	20	Qualify	1

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

NJDEP Laboratory Footnote

1. The reported result was greater than the MDL but less than the RL and therefore was estimated.

Soil Target Analyte Summary Hit List (VOCs)

Site Name PPG - North Forest Street PDI
Sampling Date November 14, 2016
Lab Name/ID SGS/Accutest, Dayton, NJ
SDG No JC31705A
Sample Matrix Soil
Trip Blank ID NA
Field Blank ID NFS-FB20161114

Field Sample ID	Lab Sample ID	Analyte	Method Blank (ug/kg)	Laboratory Sample Result (ug/kg)	Validation Sample Result (ug/kg)	RL (ug/kg)	Quality Assurance Decision	NJDEP Validation Footnote
NFS-PDI-CC12BR-0.5-1.0	JC31705-2A	DICHLOROMETHANE	U	1.4J	1.4	5.8	Qualify	2
NFS-PDI-CC12BR-10.5-11.0	JC31705-3A	1,2,3-TRICHLOROBENZENE	U	0.27J	0.27	4.9	Qualify	2
NFS-PDI-CC12BR-10.5-11.0	JC31705-3A	1,2,4-TRICHLOROBENZENE	U	0.75J	0.75	4.9	Qualify	2
NFS-PDI-CC12BR-10.5-11.0	JC31705-3A	1,2-DICHLOROBENZENE	U	0.36J	0.36	0.98	Qualify	2
NFS-PDI-CC12BR-10.5-11.0	JC31705-3A	1,4-DICHLOROBENZENE	U	0.24J	0.24	0.98	Qualify	2
NFS-PDI-CC12BR-10.5-11.0	JC31705-3A	METHYL-TERT-BUTYL ETHER	U	0.71J	0.71	0.98	Qualify	2
NFS-PDI-CC12BR-12.5-13.0	JC31705-4A	DICHLOROMETHANE	U	1.9J	1.9	5.6	Qualify	2
NFS-PDI-CC12BR-12.5-13.0	JC31705-4A	METHYL-TERT-BUTYL ETHER	U	0.91J	0.91	1.1	Qualify	2
NFS-PDI-CC12BR-12.5-13.0	JC31705-4A	TETRACHLOROETHENE	U	0.64J	0.64	2.3	Qualify	2
NFS-PDI-CC12BR-12.5-13.0	JC31705-4A	TOLUENE	U	0.27J	0.27	1.1	Qualify	2
NFS-PDI-CC12BR-14.5-15.0	JC31705-5A	1,2,3-TRICHLOROBENZENE	U	0.30J	0.30	4.6	Qualify	2
NFS-PDI-CC12BR-14.5-15.0	JC31705-5A	1,2,4-TRICHLOROBENZENE	U	1.2J	1.2	4.6	Qualify	2
NFS-PDI-CC12BR-14.5-15.0	JC31705-5A	1,2-DICHLOROBENZENE	U	0.32J	0.32	0.92	Qualify	2
NFS-PDI-CC12BR-14.5-15.0	JC31705-5A	1,4-DICHLOROBENZENE	U	0.22J	0.22	0.92	Qualify	2
NFS-PDI-CC12BR-14.5-15.0	JC31705-5A	DICHLOROMETHANE	U	1.7J	1.7	4.6	Qualify	2
NFS-PDI-CC12BR-14.5-15.0	JC31705-5A	METHYL-TERT-BUTYL ETHER	U	0.68J	0.68	0.92	Qualify	2
NFS-PDI-CC12BR-14.5-15.0	JC31705-5A	TOLUENE	U	0.17J	0.17	0.92	Qualify	2

Field Sample ID	Lab Sample ID	Analyte	Method Blank (ug/kg)	Laboratory Sample Result (ug/kg)	Validation Sample Result (ug/kg)	RL (ug/kg)	Quality Assurance Decision	NJDEP Validation Footnote
NFS-PDI-CC12BR-16.5-17.0	JC31705-6A	1,2,4-TRICHLOROENZENE	U	0.84J	0.84	4.6	Qualify	2
NFS-PDI-CC12BR-16.5-17.0	JC31705-6A	1,2-DICHLOROENZENE	U	0.23J	0.23	0.93	Qualify	2
NFS-PDI-CC12BR-18.5-19.0	JC31705-7A	1,2,4-TRICHLOROENZENE	U	0.61J	0.61	5.5	Qualify	2
NFS-PDI-CC12BR-18.5-19.0	JC31705-7A	1,2-DICHLOROENZENE	U	0.29J	0.29	1.1	Qualify	2
NFS-PDI-CC12BR-18.5-19.0	JC31705-7A	1,4-DICHLOROENZENE	U	0.20J	0.20	1.1	Qualify	2
NFS-PDI-CC12BR-18.5-19.0	JC31705-7A	DICHLOROMETHANE	U	1.6J	1.6	5.5	Qualify	2
NFS-PDI-CC12BR-18.5-19.0	JC31705-7A	METHYL-TERT-BUTYL ETHER	U	1.0J	1.0	1.1	Qualify	2
NFS-PDI-CC12BR-18.5-19.0	JC31705-7A	TOLUENE	U	0.21J	0.21	1.1	Qualify	2
NFS-PDI-CC12BR-2.5-3.0	JC31705-8A	2-BUTANONE (MEK)	U	6.5J	6.5	11	Qualify	2
NFS-PDI-CC12BR-2.5-3.0	JC31705-8A	ACETONE	U	34.7	34.7	11		
NFS-PDI-CC12BR-2.5-3.0	JC31705-8A	BENZENE	U	0.37J	0.37	0.57	Qualify	2
NFS-PDI-CC12BR-2.5-3.0	JC31705-8A	CARBON DISULFIDE	U	0.28J	0.28	2.3	Qualify	2
NFS-PDI-CC12BR-2.5-3.0	JC31705-8A	CHLOROENZENE	U	0.56J	0.56	2.3	Qualify	2
NFS-PDI-CC12BR-2.5-3.0	JC31705-8A	VINYL CHLORIDE	U	2.1J	2.1	2.3	Qualify	2
NFS-PDI-CC12BR-4.5-5.0	JC31705-10A	1,2-DICHLOROENZENE	U	0.82J	0.82	1.2	Qualify	2
NFS-PDI-CC12BR-4.5-5.0	JC31705-10A	1,2-DICHLOROETHANE	U	0.45J	0.45	1.2	Qualify	2
NFS-PDI-CC12BR-4.5-5.0	JC31705-10A	1,4-DICHLOROENZENE	U	48.8	48.8	1.2		
NFS-PDI-CC12BR-4.5-5.0	JC31705-10A	2-BUTANONE (MEK)	U	38.7	38.7	12		
NFS-PDI-CC12BR-4.5-5.0	JC31705-10A	ACETONE	U	155	155	12		
NFS-PDI-CC12BR-4.5-5.0	JC31705-10A	BENZENE	U	2.4	2.4	0.62		
NFS-PDI-CC12BR-4.5-5.0	JC31705-10A	CARBON DISULFIDE	U	0.92J	0.92	2.5	Qualify	2
NFS-PDI-CC12BR-4.5-5.0	JC31705-10A	CHLOROENZENE	U	169	169	2.5		
NFS-PDI-CC12BR-4.5-5.0	JC31705-10A	CIS-1,2-DICHLOROETHENE	U	3.0	3.0	1.2		
NFS-PDI-CC12BR-4.5-5.0	JC31705-10A	M-DICHLOROENZENE	U	18.8	18.8	1.2		
NFS-PDI-CC12BR-4.5-5.0	JC31705-10A	METHYL-TERT-BUTYL ETHER	U	0.48J	0.48	1.2	Qualify	2

Field Sample ID	Lab Sample ID	Analyte	Method Blank (ug/kg)	Laboratory Sample Result (ug/kg)	Validation Sample Result (ug/kg)	RL (ug/kg)	Quality Assurance Decision	NJDEP Validation Footnote
NFS-PDI-CC12BR-4.5-5.0	JC31705-10A	TOLUENE	U	0.71J	0.71	1.2	Qualify	2
NFS-PDI-CC12BR-4.5-5.0	JC31705-10A	VINYL CHLORIDE	U	4.8	4.8	2.5		
NFS-PDI-CC12BR-5.0-5.5	JC31705-11A	1,2-DICHLOROBENZENE	U	2.5	2.5	1.1		
NFS-PDI-CC12BR-5.0-5.5	JC31705-11A	1,4-DICHLOROBENZENE	U	35.2	35.2	1.1		
NFS-PDI-CC12BR-5.0-5.5	JC31705-11A	2-BUTANONE (MEK)	U	7.2J	7.2	11	Qualify	2
NFS-PDI-CC12BR-5.0-5.5	JC31705-11A	ACETONE	U	42.6	42.6	11		
NFS-PDI-CC12BR-5.0-5.5	JC31705-11A	BENZENE	U	0.38J	0.38	0.54	Qualify	2
NFS-PDI-CC12BR-5.0-5.5	JC31705-11A	CARBON DISULFIDE	U	0.64J	0.64	2.1	Qualify	2
NFS-PDI-CC12BR-5.0-5.5	JC31705-11A	CHLOROBENZENE	U	47.1	47.1	2.1		
NFS-PDI-CC12BR-5.0-5.5	JC31705-11A	CIS-1,2-DICHLOROETHENE	U	0.66J	0.66	1.1	Qualify	2
NFS-PDI-CC12BR-5.0-5.5	JC31705-11A	DICHLOROMETHANE	U	1.8J	1.8	5.4	Qualify	2
NFS-PDI-CC12BR-5.0-5.5	JC31705-11A	M-DICHLOROBENZENE	U	11.2	11.2	1.1		
NFS-PDI-CC12BR-5.0-5.5	JC31705-11A	METHYL-TERT-BUTYL ETHER	U	0.32J	0.32	1.1	Qualify	2
NFS-PDI-CC12BR-5.0-5.5	JC31705-11A	TOLUENE	U	0.29J	0.29	1.1	Qualify	2
NFS-PDI-CC12BR-6.5-7.0	JC31705-12A	1,2,4-TRICHLOROBENZENE	U	0.51J	0.51	6.0	Qualify	2
NFS-PDI-CC12BR-6.5-7.0	JC31705-12A	1,2-DICHLOROBENZENE	U	5.8	5.8	1.2	Qualify	1
NFS-PDI-CC12BR-6.5-7.0	JC31705-12A	1,4-DICHLOROBENZENE	U	18.2	18.2	1.2	Qualify	1
NFS-PDI-CC12BR-6.5-7.0	JC31705-12A	2-BUTANONE (MEK)	U	3.6J	3.6	12	Qualify	2
NFS-PDI-CC12BR-6.5-7.0	JC31705-12A	ACETONE	U	26.7	26.7	12	Qualify	1
NFS-PDI-CC12BR-6.5-7.0	JC31705-12A	CHLOROBENZENE	U	9.7	9.7	2.4	Qualify	1
NFS-PDI-CC12BR-6.5-7.0	JC31705-12A	DICHLOROMETHANE	U	1.9J	1.9	6.0	Qualify	2
NFS-PDI-CC12BR-6.5-7.0	JC31705-12A	M-DICHLOROBENZENE	U	8.5	8.5	1.2	Qualify	1
NFS-PDI-CC12BR-6.5-7.0	JC31705-12A	METHYL-TERT-BUTYL ETHER	U	0.45J	0.45	1.2	Qualify	2
NFS-PDI-CC12BR-6.5-7.0	JC31705-12A	TOLUENE	U	0.48J	0.48	1.2	Qualify	2
NFS-PDI-CC12BR-6.5-7.0X	JC31705-13A	1,2-DICHLOROBENZENE	U	3.4	3.4	1.1	Qualify	1

Field Sample ID	Lab Sample ID	Analyte	Method Blank (ug/kg)	Laboratory Sample Result (ug/kg)	Validation Sample Result (ug/kg)	RL (ug/kg)	Quality Assurance Decision	NJDEP Validation Footnote
NFS-PDI-CC12BR-6.5-7.0X	JC31705-13A	1,4-DICHLOROBENZENE	U	8.4	8.4	1.1	Qualify	1
NFS-PDI-CC12BR-6.5-7.0X	JC31705-13A	ACETONE	U	9.5J	9.5	11	Qualify	1,2
NFS-PDI-CC12BR-6.5-7.0X	JC31705-13A	CHLOROBENZENE	U	5.5	5.5	2.2	Qualify	1
NFS-PDI-CC12BR-6.5-7.0X	JC31705-13A	CIS-1,2-DICHLOROETHENE	U	0.65J	0.65	1.1	Qualify	2
NFS-PDI-CC12BR-6.5-7.0X	JC31705-13A	M-DICHLOROBENZENE	U	4.1	4.1	1.1	Qualify	1
NFS-PDI-CC12BR-6.5-7.0X	JC31705-13A	METHYL-TERT-BUTYL ETHER	U	0.69J	0.69	1.1	Qualify	2
NFS-PDI-CC12BR-6.5-7.0X	JC31705-13A	TOLUENE	U	0.20J	0.20	1.1	Qualify	2
NFS-PDI-CC12BR-8.5-9.0	JC31705-14A	1,2,4-TRICHLOROBENZENE	U	0.86J	0.86	6.3	Qualify	2
NFS-PDI-CC12BR-8.5-9.0	JC31705-14A	1,2-DICHLOROBENZENE	U	0.56J	0.56	1.3	Qualify	2
NFS-PDI-CC12BR-8.5-9.0	JC31705-14A	1,4-DICHLOROBENZENE	U	0.52J	0.52	1.3	Qualify	2
NFS-PDI-CC12BR-8.5-9.0	JC31705-14A	CHLOROBENZENE	U	0.21J	0.21	2.5	Qualify	2
NFS-PDI-CC12BR-8.5-9.0	JC31705-14A	METHYL-TERT-BUTYL ETHER	U	1.0J	1.0	1.3	Qualify	2

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

NJDEP Laboratory Footnote

1. The reported value was qualified due to poor field duplicate precision with unknown direction of bias.
2. The reported result was greater than the MDL but less than the RL and therefore was estimated.

Soil Target Analyte Summary Hit List (SVOCs)

Site Name PPG - North Forest Street PDI
Sampling Date November 14, 2016
Lab Name/ID SGS/Accutest, Dayton, NJ
SDG No JC31705A
Sample Matrix Soil
Trip Blank ID NA
Field Blank ID NFS-FB20161114

Field Sample ID	Lab Sample ID	Analyte	Method Blank (ug/kg)	Laboratory Sample Result (ug/kg)	Validation Sample Result (ug/kg)	RL (ug/kg)	Quality Assurance Decision	NJDEP Validation Footnote
NFS-PDI-CC12BR-0.5-1.0	JC31705-2A	1-1'-BIPHENYL	U	32.9J	32.9	80	Qualify	1
NFS-PDI-CC12BR-0.5-1.0	JC31705-2A	2-CHLORONAPHTHALENE	U	16.3J	16.3	80	Qualify	1
NFS-PDI-CC12BR-0.5-1.0	JC31705-2A	2-METHYLNAPHTHALENE	U	88.3	88.3	80		
NFS-PDI-CC12BR-0.5-1.0	JC31705-2A	ACENAPHTHENE	U	203	203	40		
NFS-PDI-CC12BR-0.5-1.0	JC31705-2A	ACENAPHTHYLENE	U	112	112	40		
NFS-PDI-CC12BR-0.5-1.0	JC31705-2A	ANTHRACENE	U	497	497	40		
NFS-PDI-CC12BR-0.5-1.0	JC31705-2A	BENZO(A)ANTHRACENE	U	884	884	40		
NFS-PDI-CC12BR-0.5-1.0	JC31705-2A	BENZO(A)PYRENE	U	676	676	40		
NFS-PDI-CC12BR-0.5-1.0	JC31705-2A	BENZO(B)FLUORANTHENE	U	852	852	40		
NFS-PDI-CC12BR-0.5-1.0	JC31705-2A	BENZO(G,H,I)PERYLENE	U	498	498	40		
NFS-PDI-CC12BR-0.5-1.0	JC31705-2A	BENZO(K)FLUORANTHENE	U	276	276	40		
NFS-PDI-CC12BR-0.5-1.0	JC31705-2A	CARBAZOLE	U	234	234	80		
NFS-PDI-CC12BR-0.5-1.0	JC31705-2A	CHRYSENE	U	901	901	40		
NFS-PDI-CC12BR-0.5-1.0	JC31705-2A	DIBENZO(A,H)ANTHRACENE	U	142	142	40		
NFS-PDI-CC12BR-0.5-1.0	JC31705-2A	DIBENZOFURAN	U	178	178	80		

Field Sample ID	Lab Sample ID	Analyte	Method Blank (ug/kg)	Laboratory Sample Result (ug/kg)	Validation Sample Result (ug/kg)	RL (ug/kg)	Quality Assurance Decision	NJDEP Validation Footnote
NFS-PDI-CC12BR-0.5-1.0	JC31705-2A	FLUORANTHENE	U	1610	1610	40		
NFS-PDI-CC12BR-0.5-1.0	JC31705-2A	FLUORENE	U	225	225	40		
NFS-PDI-CC12BR-0.5-1.0	JC31705-2A	INDENO(1,2,3-CD)PYRENE	U	412	412	40		
NFS-PDI-CC12BR-0.5-1.0	JC31705-2A	NAPHTHALENE	U	214	214	40		
NFS-PDI-CC12BR-0.5-1.0	JC31705-2A	PHENANTHRENE	U	2180	2180	40		
NFS-PDI-CC12BR-0.5-1.0	JC31705-2A	PYRENE	U	2150	2150	40		
NFS-PDI-CC12BR-2.5-3.0	JC31705-8A	1-1'-BIPHENYL	U	18.0J	18.0	71	Qualify	1
NFS-PDI-CC12BR-2.5-3.0	JC31705-8A	2-METHYLNAPHTHALENE	U	57.7J	57.7	71	Qualify	1
NFS-PDI-CC12BR-2.5-3.0	JC31705-8A	ACENAPHTHENE	U	112	112	35		
NFS-PDI-CC12BR-2.5-3.0	JC31705-8A	ACENAPHTHYLENE	U	30.2J	30.2	35	Qualify	1
NFS-PDI-CC12BR-2.5-3.0	JC31705-8A	ANTHRACENE	U	237	237	35		
NFS-PDI-CC12BR-2.5-3.0	JC31705-8A	BENZALDEHYDE	U	54.0J	54.0	180	Qualify	1
NFS-PDI-CC12BR-2.5-3.0	JC31705-8A	BENZO(A)ANTHRACENE	U	538	538	35		
NFS-PDI-CC12BR-2.5-3.0	JC31705-8A	BENZO(A)PYRENE	U	484	484	35		
NFS-PDI-CC12BR-2.5-3.0	JC31705-8A	BENZO(B)FLUORANTHENE	U	514	514	35		
NFS-PDI-CC12BR-2.5-3.0	JC31705-8A	BENZO(G,H,I)PERYLENE	U	314	314	35		
NFS-PDI-CC12BR-2.5-3.0	JC31705-8A	BENZO(K)FLUORANTHENE	U	159	159	35		
NFS-PDI-CC12BR-2.5-3.0	JC31705-8A	CARBAZOLE	U	74.8	74.8	71		
NFS-PDI-CC12BR-2.5-3.0	JC31705-8A	CHRYSENE	U	485	485	35		
NFS-PDI-CC12BR-2.5-3.0	JC31705-8A	DIBENZO(A,H)ANTHRACENE	U	84.1	84.1	35		
NFS-PDI-CC12BR-2.5-3.0	JC31705-8A	DIBENZOFURAN	U	61.4J	61.4	71	Qualify	1
NFS-PDI-CC12BR-2.5-3.0	JC31705-8A	FLUORANTHENE	U	1030	1030	35		
NFS-PDI-CC12BR-2.5-3.0	JC31705-8A	FLUORENE	U	92.0	92.0	35		
NFS-PDI-CC12BR-2.5-3.0	JC31705-8A	INDENO(1,2,3-CD)PYRENE	U	268	268	35		
NFS-PDI-CC12BR-2.5-3.0	JC31705-8A	NAPHTHALENE	U	106	106	35		

Field Sample ID	Lab Sample ID	Analyte	Method Blank (ug/kg)	Laboratory Sample Result (ug/kg)	Validation Sample Result (ug/kg)	RL (ug/kg)	Quality Assurance Decision	NJDEP Validation Footnote
NFS-PDI-CC12BR-2.5-3.0	JC31705-8A	PHENANTHRENE	U	890	890	35		
NFS-PDI-CC12BR-2.5-3.0	JC31705-8A	PYRENE	U	1560	1560	35		
NFS-PDI-CC12BR-4.5-5.0	JC31705-10A	1,2-DICHLOROBENZENE	U	180JN	180	0		
NFS-PDI-CC12BR-4.5-5.0	JC31705-10A	2-METHYLNAPHTHALENE	U	26.5J	26.5	83	Qualify	1
NFS-PDI-CC12BR-4.5-5.0	JC31705-10A	ACENAPHTHENE	U	103	103	42		
NFS-PDI-CC12BR-4.5-5.0	JC31705-10A	ANTHRACENE	U	188	188	42		
NFS-PDI-CC12BR-4.5-5.0	JC31705-10A	BENZALDEHYDE	U	55.8J	55.8	210	Qualify	1
NFS-PDI-CC12BR-4.5-5.0	JC31705-10A	BENZO(A)ANTHRACENE	U	427	427	42		
NFS-PDI-CC12BR-4.5-5.0	JC31705-10A	BENZO(A)PYRENE	U	377	377	42		
NFS-PDI-CC12BR-4.5-5.0	JC31705-10A	BENZO(B)FLUORANTHENE	U	387	387	42		
NFS-PDI-CC12BR-4.5-5.0	JC31705-10A	BENZO(G,H,I)PERYLENE	U	238	238	42		
NFS-PDI-CC12BR-4.5-5.0	JC31705-10A	BENZO(K)FLUORANTHENE	U	139	139	42		
NFS-PDI-CC12BR-4.5-5.0	JC31705-10A	CARBAZOLE	U	58.5J	58.5	83	Qualify	1
NFS-PDI-CC12BR-4.5-5.0	JC31705-10A	CHRYSENE	U	429	429	42		
NFS-PDI-CC12BR-4.5-5.0	JC31705-10A	DIBENZO(A,H)ANTHRACENE	U	66.2	66.2	42		
NFS-PDI-CC12BR-4.5-5.0	JC31705-10A	DIBENZOFURAN	U	45.8J	45.8	83	Qualify	1
NFS-PDI-CC12BR-4.5-5.0	JC31705-10A	FLUORANTHENE	U	849	849	42		
NFS-PDI-CC12BR-4.5-5.0	JC31705-10A	FLUORENE	U	86.3	86.3	42		
NFS-PDI-CC12BR-4.5-5.0	JC31705-10A	INDENO(1,2,3-CD)PYRENE	U	196	196	42		
NFS-PDI-CC12BR-4.5-5.0	JC31705-10A	NAPHTHALENE	U	50.4	50.4	42		
NFS-PDI-CC12BR-4.5-5.0	JC31705-10A	PHENANTHRENE	U	664	664	42		
NFS-PDI-CC12BR-4.5-5.0	JC31705-10A	PYRENE	U	921	921	42		
NFS-PDI-CC12BR-6.5-7.0X	JC31705-13A	1,2,4,5-TETRACHLOROBENZENE	U	18.0J	18.0	220	Qualify	1

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

NJDEP Laboratory Footnote

1. The reported result was greater than the MDL but less than the RL and therefore was estimated.

Attachment B

Data Validation Report Form

Client Name: PPG Industries		Project Number: 60314351.GA.DE.PDI.NFS			
Site Location: PPG - North Forest Street PDI, Jersey City, NJ		Project Manager: Aimee Ruiter			
Laboratory: SGS/Accutest, Dayton, NJ		Type of Validation: Limited			
Laboratory Job No: JC31705A		Date Checked: 12/06/2016			
Validator: Charlene Livingston Flint		Peer: Kristin Rutherford			
ITEM	YES	NO	N/A	COMMENTS	
Sample results included?	X				
Reporting Limits met project requirements?	X				
Field I.D. included?	X				
Laboratory I.D. included?	X				
Did data package sample IDs match sample IDs on COC?	X				
Did electronic data deliverable (EDD) sample IDs match COC sample IDs?	X				
Did data package sample IDs match electronic data deliverable (EDD) sample IDs?	X				
Sample matrix included?	X				
Sample receipt temperature 2-6°C?	X			3.1° C	
Signed COCs included?	X			COC not signed completely on all pages. Some dates missing. Initial release not signed on sequential pages. No qualifications made based on COC.	
Date of sample collection included?	X				
Date of sample digestion included?	X				
Date of analysis included?	X				
Holding time met QC criteria? (Metals -180 days from sample collection; Mercury - 28 days from sample collection. If HT exceeded by 10 days R all results.	X				
Method reference included?	X				
Laboratory Case Narrative included?	X				
Definitions: MDL - Method Detection Limit; %R - Percent Recovery; RL - Reporting Limit; RPD - Relative Percent Difference; RSD - Relative Standard Deviation :Corr - Correlation Coefficient.					

ITEM	YES	NO	N/A	COMMENTS
Sample dilutions?	X			JC31705-7A dil 2x for thallium and manganese. See table
Initial calibration documentation included in lab package?			X	N/A for Limited Validation
1) Calibrate daily or each time instrument is set up.			X	
2) ICP (6010) -Blank plus 1 standard?			X	
3) Hg (7470/7471) -Blank plus 5 standards?			X	
Initial Calibration Verification Standard (ICV) for ICP (6010) and Initial Calibration Check Standard (ICCS) for Hg (7470/7471) included in lab package?			X	N/A for Limited Validation
1) Analyzed immediately after initial calibration?			X	
2) %R criteria met? (90-110%)			X	
3) Spot check ICV/ICCS results for several analytes.			X	
Continuing Calibration Verification Standard (CCV) for ICP (6010) and Calibration Check Standard (CCS) for Hg (7470/7471) included in Lab Package?			X	N/A for Limited Validation
1) Analyzed immediately after each ICV/ICC/CB and after every 10 samples?			X	
2) CCS and CCV from independent source and at mid- level of calibration curve.			X	
3) %R criteria met? (90-110%R).			X	
4) Spot check CCV/CCS results for several analytes.			X	
Low Calibration Standard (CRI) included in Lab Package?			X	N/A for Limited Validation
1) %R criteria met?			X	
Calibration Blanks			X	N/A for Limited Validation
1) Analyzed after daily calibration and after each ICV/ICC/CCV/CCS and after every 10 samples?			X	
2) Absolute value <3xIDL?			X	
Method Blank Included in Lab Package?	X			
1) Method blank analyzed with each preparation batch or every SDG, or 1/20 samples?	X			
2) Method blank analyzed 1/20 samples	X			
3) MB results nondetect?		X		see table below
4) Negative MB result reported?		X		
Field Blanks/Equipment Blanks Included in Lab Package?	X			NFS-FB20161114

ITEM	YES	NO	N/A	COMMENTS
1) FB/EB result non-detect?		X		see table below
ICP Interference Check Sample (ICS) included in Lab Package?			X	N/A for Limited Validation
1) Analyzed at beginning of analytical run?			X	
2) %R criteria met? (80-120%)			X	
3) Spot check accuracy of %Rs			X	
Matrix Spike/Matrix Spike Duplicate Data Included in Lab Package?	X			JC31705-3A
1) MS/MSD %R (75-125%R) and RPD (20%) criteria met?		X		see table below
2) Was a sample spiked at the frequency of 1/batch or 20 samples?	X			
3) Was the MS performed on a site sample?	X			
4) Was the MS performed on a FB/EB or TB?		X		
Post Digestion Spike			X	N/A for Limited Validation
1) %R criteria met? (75-125%R)			X	
2) Was the spike performed on a FB/EB or TB?			X	
3) Was a sample spiked at the frequency of 1/batch or 20 samples?			X	
Laboratory Duplicate Data Included in Lab Package?		X		
Aqueous - RPD criteria met? (20%)			X	
Soil - RPD criteria met? (35%)			X	
Was a Laboratory Control Sample (LCS) Included in Lab Package?	X			
1) LCS %R criteria met? (80-120%R).	X			
2) Was an LCS analyzed at the frequency of 1/batch or 20 samples?	X			
Serial Dilution			X	N/A for Limited Validation
1) %D (<10%R) criteria met? -			X	
2) Was the frequency 1/batch or 20 samples?			X	
3) Was a site sample used?		X		
4) Was a FB/EB or TB used?			X	
5) Spot check accuracy of %Ds.			X	

ITEM	YES	NO	N/A	COMMENTS
Field Duplicate Data included in Lab Package?	X			JC31705-12A & JC31705-13A
Aqueous - RPD criteria met? (20%)			X	
Soil - RPD criteria met? (35%)		X		Chromium exceeded QC limit. See table.
Percent Solids data included in Lab Package?	X			
1) % Solids criteria (Reg 2 criteria) met? (\geq 50%)	X			
Chromium result greater than corresponding hexavalent chromium result where applicable?	X			Hexavalent chromium reported in JC31705,R

Blanks

Analyte	Result	3X	10X	Actions	Associated Samples
Soil Method Blank MP97190/ MP97177	(mg/kg)	(mg/kg)	(mg/kg)		
Aluminum	6.8	20.4	68	OK, >10X MB	All soil samples
Barium	0.25	0.75	2.5	OK, >10X MB	All soil samples
Beryllium	0.029	0.087	0.29	>10X MB	All soil samples with the exception of JC31705-7A
Beryllium	0.029	0.087	0.29	>3x but <10x MB, Estimate (JB)	NFS-PDI-CC12BR-18.5-19.0 (JC31705-7A)
Calcium	21.1	63.3	211	OK, >10X MB	All soil samples
Chromium	0.16	0.48	1.6	OK, >10X MB	All soil samples
Copper	0.25	0.75	2.5	OK, >10X MB	All soil samples
Iron	12.1	36.3	121	OK, >10X MB	All soil samples
Magnesium	13.5	40.5	135	OK, >10X MB	All soil samples
Manganese	0.23	0.69	2.3	OK, >10X MB	All soil samples
Sodium	23.4	70.2	234	OK, >10X MB	NFS-PDI-CC12BR-16.5-17.0 (JC31705-6A)
Sodium	23.4	70.2	234	>3x but <10x MB, Estimate (JB)	All soil samples with the exception of JC31705-6A
Zinc	0.36	1.08	3.6	OK, >10X MB	All soil samples
Mercury	0.0071	0.0213	0.071	OK, >10X MB	Samples NFS-PDI-CC12BR-0.5-1.0 (JC31705-2A), NFS-PDI-CC12BR-2.5-3.0 (JC31705-8A), NFS-PDI-CC12BR-4.5-5.0 (JC31705-10A), NFS-PDI-CC12BR-5.0-5.5 (JC31705-11A)
Mercury	0.0071	0.0213	0.071	>3x but <10x MB, Estimate (JB)	Samples NFS-PDI-CC12BR-6.5-7.0 (JC31705-12A), NFS-PDI-CC12BR-6.5-7.0X

					(JC31705-13A)
Mercury	0.0071	0.0213	0.071	<3x MB, Negate (UB)	Samples NFS-PDI-CC12BR-10.5-11.0 (JC31705-3A), NFS-PDI-CC12BR-14.5-15.0 (JC31705-5A), NFS-PDI-CC12BR-16.5-17.0 (JC31705-6A), NFS-PDI-CC12BR-18.5-19.0 (JC31705-7A), NFS-PDI-CC12BR-20.0-20.5 (JC31705-9A), NFS-PDI-CC12BR-8.5-9.0 (JC31705-14A)
Mercury	0.0071	0.0213	0.071	OK, ND	Samples NFS-PDI-CC12BR-10.5-11.0 (JC31705-3A), NFS-PDI-CC12BR-14.5-15.0 (JC31705-5A), NFS-PDI-CC12BR-16.5-17.0 (JC31705-6A), NFS-PDI-CC12BR-18.5-19.0 (JC31705-7A), NFS-PDI-CC12BR-20.0-20.5 (JC31705-9A), NFS-PDI-CC12BR-8.5-9.0 (JC31705-14A)

Analyte	Result	3X	10X	Actions	Associated Samples
Aqueous Method Blank MP97152	(ug/l)	(ug/l)	(ug/l)		
ND				None	NFS-FB20161114

Analyte	Result	Converted result	3X	10X	Actions	Associated Samples
Equipment Blank	(ug/l)	(mg/kg)*	(mg/kg)	(mg/kg)		
Sodium	84.9	8.49	25.47	84.9	OK, >10X EB	All soil samples
Barium	0.7	0.07	0.21	0.7	OK, >10X EB	All soil samples
Zinc	2.50	0.25	0.75	2.5	OK, >10X EB	All soil samples

*Note: A nominal weight of 1g and nominal final volume of 0.10L was used to convert aqueous units (ug/L) to soils units (mg/kg) in the absence of a full data deliverable.

Matrix Spikes

Sample ID	Lab ID	Analyte	MS % R	MSD % R	Lower Limit	Upper Limit	RPD	RPD Limit	Actions
NFS-PDI-CC12BR-10.5-11.0	JC31705-3A	Aluminum	192.9	219.9	75	125	6.1	20	Estimate (J) result in parent
NFS-PDI-CC12BR-10.5-11.0	JC31705-3A	Antimony	68.6	64.7	75	125	3.9	20	Estimate (J/UJ) result in parent sample, low bias
NFS-PDI-CC12BR-10.5-11.0	JC31705-3A	Manganese	130.1	85.2	75	125	13.1	20	Estimate (J) result in parent
NFS-PDI-CC12BR-10.5-11.0	JC31705-3A	Potassium	134.5	140.5	75	125	4.8	20	Estimate (J) result in parent

Field Duplicates
NFS-PDI-CC12BR-6.5-7.0 and NFS-PDI-CC12BR-6.5-7.0X

Analyte	Sample Result (mg/kg)	FD Result (mg/kg)	RL (mg/kg)	RPD (%)	RPD Limit (%)	Abs Diff (mg/kg)	Action
Antimony	0.75	0.71	2.0/1.9	5.5	35		OK
Mercury	0.033	ND	0.33	NC	35		Accept, low SR
Zinc	50.9	56.9	5.0/4.8	11.1	35		OK
Vanadium	26.6	22.2	5.0/4.8	18.0	35		OK
Copper	21.4	23.9	2.5/2.4	11.0	35		OK
Cobalt	11.3	10.8	5.0/4.8	4.5	35		OK
Chromium	164	73.2	1.0/0.96	76.6	35	90.8	Qualify (J) results in FD pair
Cadmium	0.14	0.14	0.50/0.48	0	35		OK
Beryllium	0.54	0.55	0.20/0.19	1.8	35		OK
Arsenic	6.1	5.1	2.0/1.9	17.9	35		OK
Aluminum	13,800	12,600	50/48	9.1	35		OK
Sodium	233	203	1000/960	13.8	35		OK
Silver	0.20	0.18	0.50/0.48	10.5	35		OK
Potassium	894	943	1000/960	5.3	35		OK
Nickel	16.9	16.9	4.0/3.8	0	35		OK
Manganese	624	549	1.5/1.4	12.8	35		OK
Magnesium	4,000	3,950	500/480	1.3	35		OK
Lead	10.8	11.2	2.0/1.9	3.6	35		OK
Iron	24,900	22,200	50/48	11.5	35		OK
Barium	44.0	35.5	2.0/1.9	21.4	35		OK
Calcium	1,030	900	500/480	13.5	35		OK

Percent Solids

Sample ID	Percent Solids (%)	Status
NFS-PDI-CC12BR-0.5-1.0	83.3	ok @50%
NFS-PDI-CC12BR-10.5-11.0	84.8	ok @50%
NFS-PDI-CC12BR-12.5-13.0	80.5	ok @50%
NFS-PDI-CC12BR-14.5-15.0	82	ok @50%
NFS-PDI-CC12BR-16.5-17.0	86.8	ok @50%
NFS-PDI-CC12BR-18.5-19.0	81.8	ok @50%
NFS-PDI-CC12BR-2.5-3.0	89.4	ok @50%
NFS-PDI-CC12BR-20.0-20.5	82.9	ok @50%
NFS-PDI-CC12BR-4.5-5.0	78.7	ok @50%
NFS-PDI-CC12BR-5.0-5.5	77.7	ok @50%
NFS-PDI-CC12BR-6.5-7.0	74.7	ok @50%
NFS-PDI-CC12BR-6.5-7.0X	76.8	ok @50%
NFS-PDI-CC12BR-8.5-9.0	84.1	ok @50%

Sample Dilutions

Sample	Lab ID	Dilution	Analyte
NFS-PDI-CC12BR-18.5-19.0	JC31705-7A	2	MANGANESE
NFS-PDI-CC12BR-18.5-19.0	JC31705-7A	2	THALLIUM

Client Name: PPG Industries		Project Number: 60314351.GA.DE.PDI.NFS		
Site Location: PPG - North Forest Street PDI, Jersey City, NJ		Project Manager: Aimee Ruitter		
Laboratory: SGS/Accutest, Dayton, NJ		Type of Validation: Limited		
Laboratory Job No: JC37105A		Date Checked: 12/06/2016		
Validator: Charlene Livingston Flint		Peer: Kristin Rutherford		
ITEM	YES	NO	N/A	COMMENTS
Sample results included?	X			
Reporting Limits met project requirements?	X			
Field I.D. included?	X			
Laboratory I.D. included?	X			
Did data package sample IDs match sample IDs on COC?	X			
Did electronic data deliverable (EDD) sample IDs match COC sample IDs?	X			
Did data package sample IDs match electronic data deliverable (EDD) sample IDs?	X			
Sample matrix included?	X			
Sample receipt temperature 2-6°C?	X			3.1° C
Signed COCs included?	X			COC not signed completely on all pages. Some dates missing. Initial release not signed on sequential pages. No qualifications made based on COC.
Date of sample collection included?	X			
Date of analysis included?	X			
Holding time met QC criteria? (Metals -180 days from sample collection; Mercury - 28 days from sample collection. If HT exceeded by 10 days R all results.	X			
Method reference included?	X			
Laboratory Case Narrative included?	X			
Definitions: MDL - Method Detection Limit; %R - Percent Recovery; RL - Reporting Limit; RPD - Relative Percent Difference; RSD - Relative Standard Deviation :Corr - Correlation Coefficient.				

ITEM	YES	NO	N/A	COMMENTS
Sample dilutions?		X		No dilutions
Method Blank Included in Lab Package?	X			
1) Method blank analyzed with each preparation batch?	X			
2) Absolute value should not exceed RL.	X			
Trip Blanks/Field Blanks/Equipment Blanks Included in Lab Package?	X			NFS-FB20161114
1) TB/FB/EB results non-detect?	X			
Surrogate Data Included?	X			
1) Is %R criteria (laboratory criteria) met?	X			
Matrix Spike/Matrix Spike Duplicate Data Included in Lab Package?	X			MS analyzed JC31705-3A
1) %R and RPD (laboratory criteria) met?	X			
2) Was the spike concentration at the same concentration as the LCS?	X			
3) Was a sample spiked at the frequency of 1 per 20 samples?	X			
Was a Laboratory Control Sample (LCS) Included in Lab Package?	X			
1) LCS %R criteria met? (laboratory criteria)	X			
2) Was an LCS analyzed at the frequency of 1/batch or 20 samples?	X			
Field Duplicate Data included in Lab Package?	X			JC31705-12A & JC31705-13A
1) %RPD criteria (Reg 2 criteria) met?		X		See table.
Percent Solids data included in Lab Package?	X			
1) %Solids criteria (Reg 2 criteria) met? (>=50%)	X			

Field Duplicates
NFS-PDI-CC12BR-6.5-7.0 and NFS-PDI-CC12BR-6.5-7.0X

Analyte	Sample Result (ug/kg)	Qual	FD Result (ug/kg)	Qual	RL (ug/kg)	RPD (%)	RPD Limit %	Action
1,4-Dichlorobenzene	18.2		8.4		1.2/1.1	73.7	50	Qualify (J) results in FD pair
Toluene	0.48	J	0.20	J	1.2/1.1	82.4	50	Accept, SR<4xRL, Abs Diff<RL
Chlorobenzene	9.7		5.5		2.4/2.2	55.3	50	Qualify (J) results in FD pair
1,2,4-Trichlorobenzene	0.51	J	5.6	U	6.0/5.6	166.6	50	None, one result ND, the other <RL
Cis, 1,2-Dichloroethene	1.2	U	0.65	J	1.2/1.1	59.5	50	None, one result ND, the other <RL
Methyl-tert-butyl ether	0.45	J	0.69	J	1.2/1.1	42.1	50	OK
m-Dichlorobenzene	8.5		4.1		1.2/1.1	69.8	50	Qualify (J) results in FD pair
Acetone	26.7		9.5		12/11	95.0	50	Qualify (J) results in FD pair
Dichloromethane	1.9	J	5.6	U	6.0/5.6	98.7	50	None, one result ND, the other <RL
2-Butanone	3.6	J	5.6	U	12/11	43.5	50	None, one result ND, the other <RL
1,2-Dichlorobenzene	5.8		3.4		1.2/1.1	52.2	50	Qualify (J) results in FD pair

Percent Solids

Sample ID	Percent Solids (%)	Status
NFS-PDI-CC12BR-0.5-1.0	83.3	ok @50%
NFS-PDI-CC12BR-10.5-11.0	84.8	ok @50%
NFS-PDI-CC12BR-12.5-13.0	80.5	ok @50%
NFS-PDI-CC12BR-14.5-15.0	82	ok @50%
NFS-PDI-CC12BR-16.5-17.0	86.8	ok @50%
NFS-PDI-CC12BR-18.5-19.0	81.8	ok @50%
NFS-PDI-CC12BR-2.5-3.0	89.4	ok @50%
NFS-PDI-CC12BR-20.0-20.5	82.9	ok @50%
NFS-PDI-CC12BR-4.5-5.0	78.7	ok @50%

Sample ID	Percent Solids (%)	Status
NFS-PDI-CC12BR-5.0-5.5	77.7	ok @50%
NFS-PDI-CC12BR-6.5-7.0	74.7	ok @50%
NFS-PDI-CC12BR-6.5-7.0X	76.8	ok @50%
NFS-PDI-CC12BR-8.5-9.0	84.1	ok @50%

Client Name: PPG Industries		Project Number: 60314351.GA.DE.PDI.NFS		
Site Location: PPG - North Forest Street PDI, Jersey City, NJ		Project Manager: Aimee Ruitter		
Laboratory: SGS/Accutest, Dayton, NJ		Type of Validation: Limited		
Laboratory Job No: JC31705A		Date Checked: 11/06/2016		
Validator: Charlene Livingston Flint		Peer: Kristin Rutherford		
ITEM	YES	NO	N/A	COMMENTS
Sample results included?	X			
Reporting Limits met project requirements?	X			
Field I.D. included?	X			
Laboratory I.D. included?	X			
Did data package sample IDs match sample IDs on COC?	X			
Did electronic data deliverable (EDD) sample IDs match COC sample IDs?	X			
Did data package sample IDs match electronic data deliverable (EDD) sample IDs?	X			
Sample matrix included?	X			
Sample receipt temperature 2-6°C?	X			3.1° C
Signed COCs included?	X			COC not signed completely on all pages. Some dates missing. Initial release not signed on sequential pages. No qualifications made based on COC.
Date of sample collection included?	X			
Date of sample extraction included?	X			
Date of analysis included?	X			
Holding time to analysis met criteria?	X			Re-extract of sample JC31705-1A out of HT to verify surrogate recoveries.
Method reference included?	X			
Laboratory Case Narrative included?	X			
Definitions: MDL - Method Detection Limit; %R - Percent Recovery; RL - Reporting Limit; RPD - Relative Percent Difference; RSD - Relative Standard Deviation :Corr - Correlation Coefficient.				

ITEM	YES	NO	N/A	COMMENTS
Sample dilutions?		X		No dilutions
Method Blank Included in Lab Package?	X			
1) Method blank analyzed with each preparation batch?	X			
2) Absolute value should not exceed RL.	X			Aq MB OP98646-MB1 reported bis (2-ethylhexyl) phthalate <RL. See table.
Trip Blanks/Field Blanks/Equipment Blanks Included in Lab Package?	X			NFS-FB20161114
1) TB/FB/EB results non-detect?	X			
Surrogate Data Included?	X			
1) Is %R criteria (laboratory criteria) met?	X			JC31705-1A. Surrogates 2,4,6-tribromophenol and 2-Fluorobiphenyl %R low. No qualifications. See table
Matrix Spike/Matrix Spike Duplicate Data Included in Lab Package?	X			JC31705-3A
1) %R and RPD (laboratory criteria) met?	X			
2) Was the spike concentration at the same concentration as the LCS?	X			Soil LCS @ 50 ug/kg; MS at 49.1 ug/kg.
3) Was a sample spiked at the frequency of 1 per 20 samples?	X			
Was a Laboratory Control Sample (LCS) Included in Lab Package?	X			
1) LCS %R criteria met? (laboratory criteria)	X			
2) Was an LCS analyzed at the frequency of 1/batch or 20 samples?	X			
Field Duplicate Data included in Lab Package?	X			JC31705-12A & JC31705-13A
1) %RPD criteria (Reg 2 criteria) met?	X			See table
Percent Solids data included in Lab Package?	X			
1) %Solids criteria (Reg 2 criteria) met? (>=50%)	X			

Method Blank**OP98646-MB1**

Analyte	Result (ug/L)	RL (ug/L)	Actions	Associated Samples
BIS(2-ETHYLHEXYL)PHTHALATE	1.9	2.0	None, sample result ND	NFS-FB20161114

Surrogates

Sample ID	Lab ID	Surrogate	%Recovery	Recovery Limits	Actions
NFS-FB20161114	JC31705-1A	2,4,6-Tribromophenol	29	39-149	None, other surrogates within QC limits
NFS-FB20161114	JC31705-1A	2-Fluorobiphenyl	30	35-119	None, other surrogates within QC limits

Field Duplicates**NFS-PDI-CC12BR-6.5-7.0 and NFS-PDI-CC12BR-6.5-7.0X**

Analyte	Sample Result (ug/kg)	Qual	FD Result (ug/kg)	Qual	RL (ug/kg)	RPD (%)	Action
1,2,4,5-Tetrachlorobenzene	18.0	J	220	U	210/220	169.7	None, one result ND, the other <RL

Percent Solids

Sample ID	Percent Solids (%)	Status
NFS-PDI-CC12BR-0.5-1.0	83.3	ok @50%
NFS-PDI-CC12BR-10.5-11.0	84.8	ok @50%
NFS-PDI-CC12BR-12.5-13.0	80.5	ok @50%

Sample ID	Percent Solids (%)	Status
NFS-PDI-CC12BR-14.5-15.0	82	ok @50%
NFS-PDI-CC12BR-16.5-17.0	86.8	ok @50%
NFS-PDI-CC12BR-18.5-19.0	81.8	ok @50%
NFS-PDI-CC12BR-2.5-3.0	89.4	ok @50%
NFS-PDI-CC12BR-20.0-20.5	82.9	ok @50%
NFS-PDI-CC12BR-4.5-5.0	78.7	ok @50%
NFS-PDI-CC12BR-5.0-5.5	77.7	ok @50%
NFS-PDI-CC12BR-6.5-7.0	74.7	ok @50%
NFS-PDI-CC12BR-6.5-7.0X	76.8	ok @50%
NFS-PDI-CC12BR-8.5-9.0	84.1	ok @50%

Data Validation Report

Project: PPG - North Forest Street PDI

Laboratory: SGS/Accutest, Dayton, NJ

Laboratory Job No.: JC31800 and JC31800R

Analysis/Method: Hexavalent Chromium SW846 3060A/7196A

Validation Level: Full

Site Location/Address: 70 Carteret Avenue

AECOM Project No: 60314351.GA.DE.PDI.NFS

Prepared by: Charlene Livingston Flint /AECOM Completed on: 12/08/2016

Reviewed by: Mary Kozik /AECOM File Name: JC31800_R_2016-12-08_DVReport-F

Introduction

The data were reviewed in accordance with the FSP-QAPP and the following NJDEP validation Standard Operating Procedure (SOP):

- NJDEP Office of Data Quality SOP 5.A.10, Rev 3 (September 2009), SOP for Analytical Data Validation of Hexavalent Chromium - for USEPA SW-846 Method 3060A, USEPA SW-846 Method 7196A and USEPA SW-846 Method 7199;

The results of quality control data analyzed with site samples were used to assess the overall reliability of the data. The following qualifiers were used to identify data quality issues:

- U: Indicates the analyte was not detected in the sample above the sample reporting limit.
- J: Indicates the result was an estimated value; the associated numerical value was an approximate concentration of the analyte in the sample.
- UJ: Indicates the analyte was not detected above the reporting limit and the reporting limit was approximate.
- UB: The analyte concentration is less than or equal to three (3) times the concentration in the associated method/prep blank. The presence of the analyte in the sample is negated (UB) due to laboratory contamination.
- JB: The analyte concentration is greater than three (3) times, but less than or equal to ten (10) times the concentration in the associated method/prep blank. The presence of that analyte in the sample is considered "real". The concentration is quantitatively qualified (JB) due to method blank contamination.
- R: The sample result was rejected due to serious deficiencies; the presence or absence of the analyte could not be confirmed.
- RA: The sample result was rejected but is still considered usable.

Sample Information

The samples listed below were collected by AECOM on November 15, 2016 as part of the PPG - North Forest Street PDI sampling at 70 Carteret Avenue. Only the samples and parameters listed below were validated.

Field ID	Laboratory ID	Matrix	Fraction
NFS-PDI-AA15B-0.5-1.0	JC31800-1, -1R	Soil	Hexavalent Chromium
NFS-PDI-AA15B-10.0-10.5	JC31800-2, -2R	Soil	Hexavalent Chromium
NFS-PDI-AA15B-10.5-11.0	JC31800-3, -3R	Soil	Hexavalent Chromium
NFS-PDI-AA15B-11.0-11.5	JC31800-4, -4R	Soil	Hexavalent Chromium
NFS-PDI-AA15B-11.0-11.5X (Field Duplicate of NFS-PDI-AA15B-11.0-11.5)	JC31800-5, -5R	Soil	Hexavalent Chromium
NFS-PDI-AA15B-12.0-12.5	JC31800-6, -6R	Soil	Hexavalent Chromium
NFS-PDI-AA15B-14.0-14.5	JC31800-7, -7R	Soil	Hexavalent Chromium
NFS-PDI-AA15B-16.0-16.5	JC31800-8, -8R	Soil	Hexavalent Chromium
NFS-PDI-AA15B-18.0-18.5	JC31800-9, -9R	Soil	Hexavalent Chromium
NFS-PDI-AA15B-2.0-2.5	JC31800-10, -10R	Soil	Hexavalent Chromium
NFS-PDI-AA15B-20.0-20.5	JC31800-11, -11R	Soil	Hexavalent Chromium
NFS-PDI-AA15B-4.0-4.5	JC31800-12, -12R	Soil	Hexavalent Chromium
NFS-PDI-AA15B-6.0-6.5	JC31800-13, -13R	Soil	Hexavalent Chromium
NFS-PDI-AA15B-8.0-8.5	JC31800-14, -14R	Soil	Hexavalent Chromium
NFS-PDI-BB15B-0.5-1.0	JC31800-15, -15R	Soil	Hexavalent Chromium
NFS-PDI-BB15B-10.0-10.5	JC31800-16, -16R	Soil	Hexavalent Chromium
NFS-PDI-BB15B-12.0-12.5	JC31800-17, -17R	Soil	Hexavalent Chromium
NFS-PDI-BB15B-14.0-14.5	JC31800-18, -18R	Soil	Hexavalent Chromium
NFS-PDI-BB15B-16.0-16.5	JC31800-19, -19R	Soil	Hexavalent Chromium
NFS-PDI-BB15B-18.0-18.5	JC31800-20, -20R	Soil	Hexavalent Chromium
NFS-PDI-BB15B-2.0-2.5	JC31800-21, -21R	Soil	Hexavalent Chromium
NFS-PDI-BB15B-20.0-20.5	JC31800-22, -22R	Soil	Hexavalent Chromium
NFS-PDI-BB15B-4.0-4.5	JC31800-23, -23R	Soil	Hexavalent Chromium
NFS-PDI-BB15B-4.0-4.5X (Field Duplicate of NFS-PDI-BB15B-4.0-4.5)	JC31800-24, -24R	Soil	Hexavalent Chromium
NFS-PDI-BB15B-6.0-6.5	JC31800-25, -25R	Soil	Hexavalent Chromium
NFS-PDI-BB15B-7.5-8.0	JC31800-26, -26R	Soil	Hexavalent Chromium
NFS-PDI-BB15B-8.0-8.5	JC31800-27, -27R	Soil	Hexavalent Chromium
NFS-PDI-FB20161115 (Equipment Blank)	JC31800-28	Aqueous	Hexavalent Chromium
NFS-PDI-X16BR-0.5-1.0	JC31800-29, -29R	Soil	Hexavalent Chromium
NFS-PDI-X16BR-18.0-18.5	JC31800-30, -30R	Soil	Hexavalent Chromium
NFS-PDI-X16BR-18.0-18.5X (Field Duplicate of NFS-PDI-X16BR-18.0-18.5)	JC31800-31, -31R	Soil	Hexavalent Chromium
NFS-PDI-X16BR-18.5-19.0	JC31800-32, -32R	Soil	Hexavalent Chromium
NFS-PDI-X16BR-2.0-2.5	JC31800-33, -33R	Soil	Hexavalent Chromium

Field ID	Laboratory ID	Matrix	Fraction
NFS-PDI-X16BR-4.0-4.5	JC31800-36, -36R	Soil	Hexavalent Chromium

The samples were collected following the procedures detailed in the Work Order for Garfield Avenue Remedial Action (GARA) at the 70 Carteret Avenue and the Field Sampling Plan/Quality Assurance Project Plan for Non-Residential and Residential Chromium Sites Hudson County, New Jersey (December 2011).

General Comments

Chain of Custody

Samples NFS-PDI-X16BR-20.20.5 (JC31800-34) and NFS-PDI-X16BR-22.0-22.5 (JC31800-35) were listed on the COC, but placed on hold and not analyzed.

Completeness

The data package was complete. Quality control (QC) issues identified during validation are discussed below. Refer to the Target Analyte Summary Hit(s) in Attachment A for a listing of all detected results, qualified results, and associated qualifications, where applicable. The nonconformances for each section discussed below are presented in Attachment B.

MS Results

Two matrix spike (MS) samples, NFS-PDI-AA15B-0.5-1.0 (JC31800-1) and NFS-PDI-BB15B-6.0-6.5 (JC31800-25), were analyzed with the samples in this SDG and were used for supporting data quality recommendations. MS samples are associated with field samples using matrix similarities as the primary criteria, then by analytical preparation batch when no matrix match is possible. The following table summarizes each of the MS samples and field samples associated with each, differentiating between those associated by matrix, and those associated by batch.

Spiked Sample	Samples Associated by Matrix	Samples Associated by Batch
NFS-PDI-AA15B-0.5-1.0 (JC31800-1)	NFS-PDI-AA15B-4.0-4.5 (JC31800-12)	NFS-PDI-AA15B-10.0-10.5 (JC31800-2) NFS-PDI-AA15B-10.5-11.0 (JC31800-3) NFS-PDI-AA15B-11.0-11.5 (JC31800-4) NFS-PDI-AA15B-11.0-11.5X (JC31800-5) NFS-PDI-AA15B-12.0-12.5 (JC31800-6) NFS-PDI-AA15B-14.0-14.5 (JC31800-7) NFS-PDI-AA15B-14.0-14.5 (JC31800-8) NFS-PDI-AA15B-18.0-18.5 (JC31800-9) NFS-PDI-AA15B-2.0-2.5 (JC31800-10) NFS-PDI-AA15B-20.0-20.5 (JC31800-11) NFS-PDI-AA15B-6.0-6.5 (JC31800-13) NFS-PDI-AA15B-8.0-8.5 (JC31800-14) NFS-PDI-BB15B-0.5-1.0 (JC31800-15) NFS-PDI-BB15B-10.0-10.5 (JC31800-16)

Spiked Sample	Samples Associated by Matrix	Samples Associated by Batch
NFS-PDI-BB15B-6.0-6.5 (JC31800-25)	NFS-PDI-BB15B-7.5-8.0 (JC31800-26)	NFS-PDI-BB15B-12.0-12.5 (JC31800-17) NFS-PDI-BB15B-14.0-14.5 (JC31800-18) NFS-PDI-BB15B-16.0-16.5 (JC31800-19) NFS-PDI-BB15B-18.0-18.5 (JC31800-20) NFS-PDI-BB15B-2.0-2.5 (JC31800-21) NFS-PDI-BB15B-20.0-20.5 (JC31800-22) NFS-PDI-BB15B-4.0-4.5 (JC31800-23) NFS-PDI-BB15B-4.0-4.5X (JC31800-24) NFS-PDI-BB15B-8.0-8.5 (JC31800-27) NFS-PDI-X16BR-0.5-1.0 (JC31800-29) NFS-PDI-X16BR-18.0-18.5 (JC31800-30) NFS-PDI-X16BR-18.0-18.5X (JC31800-31) NFS-PDI-X16BR-18.5-19.0 (JC31800-32) NFS-PDI-X16BR-2.0-2.5 (JC31800-33) NFS-PDI-X16BR-4.0-4.5 (JC31800-36)

MS sample NFS-PDI-AA15B-0.5-1.0 (JC31800-1)

Sample NFS-PDI-AA15B-0.5-1.0, associated with samples as noted above, was selected for the soil matrix spike analysis and used for supporting data quality recommendations. The soluble and insoluble MS recoveries for sample from the initial batch were 37.0% and 85.7%, respectively. The soluble MS recovery did not meet quality control (QC) criteria of 75-125%R. The post digestion spike (PDS) recovery was 88.13%, which met the PDS criteria of 85-115%.

Based on the soluble MS recovery less than 75%R, the MS and associated samples were reanalyzed using Method 7196. The soluble and insoluble matrix spike recoveries from the re-analysis were 63.0% and 80.6%, respectively. The soluble MS recovery did not meet the QC criteria of 75-125%R. The post spike result for the re-analysis batch was recovered at 84.8% and after pH adjustment was 85%, which met the PDS criteria of 85-115%.

Since the soluble MS recoveries were outside the acceptable QC limit of 75-125%, additional parameters were analyzed to determine if possible matrix interferences could be the cause for the poor matrix spike recoveries. All the soil samples were tested for pH and oxidation reduction potential (ORP) and plotted on an Eh/pH phase diagram chart. From this chart, the source sample for the matrix spike analysis was plotted above the phase change line, indicating oxidizing potential within the sample matrix capable of supporting hexavalent chromium. Analyses for ferrous iron, sulfide screen, and total organic carbon (TOC) were performed on the MS source sample to confirm the oxidizing/reducing potential within the sample matrix. The sulfide screen was reported as nondetect, indicating no reducing agents within the sample matrix; however, the ferrous iron (3.1%) and the TOC results (168,000 mg/Kg) were positive, indicating potential reducing agents within the sample matrix.

Since the soluble MS recoveries from both the initial and reanalysis did not meet the MS QC requirements, but at least one MS recovery was greater than 50%, the highest detected hexavalent chromium result or the nondetect hexavalent chromium result with the lowest reporting limit (RL) was reported for each soil sample. The reported hexavalent chromium results in all the associated soil samples were qualified as estimated (J/UJ) due to the low soluble MS recoveries.

MS sample NFS-PDI-BB15B-6.0-6.5 (JC31800-25)

Sample NFS-PDI-BB15B-6.0-6.5, associated with samples as noted above, was selected for the soil matrix spike analysis and used for supporting data quality recommendations. The soluble and insoluble MS recoveries from the initial batch were 1.0% and 61.5%, respectively. The soluble and insoluble MS recoveries did not meet QC criteria of 75-125%R. The PDS recovery was 33.43% and after pH adjustment was 46.46%, which did not meet the PDS criteria of 85-115%.

Based on low MS recoveries, less than 75%R, the MS and associated samples were reanalyzed using Method 7196. The soluble and insoluble matrix spike recoveries from the re-analysis were 11.3% and 51.5%, respectively. The soluble and insoluble MS recoveries did not meet the QC criteria of 75-125%R. The post spike result for the re-analysis batch was recovered at 54% and after pH adjustment was 44%, which did not meet the PDS criteria of 85-115%.

Since the soluble and/or insoluble MS recoveries were outside the acceptable QC limit of 75-125%, additional parameters were analyzed to determine if possible matrix interferences could be the cause for the low matrix spike recoveries. All the soil samples were tested for pH and ORP and plotted on an Eh/pH phase diagram chart. From this chart, the source sample for the matrix spike analysis was plotted below the phase change line, indicating reducing potential within the sample matrix incapable of supporting hexavalent chromium. Analyses for ferrous iron, sulfide screen, and TOC were performed on the MS source sample to confirm the oxidizing/reducing potential within the sample matrix. The sulfide screen was reported as nondetect, indicating no reducing agents within the sample matrix; however, the ferrous iron (1.0%) and the TOC results (35,700 mg/Kg) were positive, indicating potential reducing agents within the sample matrix.

Since the MS recoveries from both the initial and reanalysis did not meet the MS QC requirements, but at least one MS recovery was greater than 50%, the highest detected hexavalent chromium result or the nondetect hexavalent chromium result with the lowest RL was reported for each soil sample. The reported hexavalent chromium results in all the associated soil samples were qualified as estimated (J/UJ) due to MS and PDS recoveries below their respective control limits.

Laboratory Duplicate Precision

Two sets of samples were selected by the laboratory to demonstrate laboratory precision capabilities.

The relative percent difference for hexavalent chromium in sample NFS-PDI-AA15B-0.5-1.0 (JC31800-1), associated with samples JC31800-1 through JC31800-16, exceeded the QC acceptance RPD in both the initial analysis and the reanalysis; therefore, the hexavalent chromium results in the associated soil samples reported from either analysis were qualified as estimated (J/UJ).

Sample NFS-PDI-BB15B-6.0-6.5 (JC31800-25), associated with samples JC31800-17 through JC31800-36, met all QC criteria; therefore, no qualifications were necessary.

Field Duplicate Results

Three field duplicate pairs, NFS-PDI-AA15B-11.0-11.5 (JC31800-4) & NFS-PDI-AA15B-11.0-11.5X (JC31800-5R), NFS-PDI-BB15B-4.0-4.5 (JC31800-23R) & NFS-PDI-BB15B-4.0-4.5X (JC31800-24) and NFS-PDI-X16BR-18.0-18.5 (JC31800-30) & NFS-PDI-X16BR-18.0-18.5X (JC31800-31R), are associated with the samples in this SDG and were used for supporting data quality recommendations. Field duplicate samples are associated with field samples using matrix similarities as the primary criteria, then by analytical preparation batch when no matrix match is possible. The following table summarizes each of the field duplicate samples and field samples associated with each, differentiating between those associated by matrix, and those associated by batch.

Field Duplicate Sample	Samples Associated by Matrix	Samples Associated by Batch
NFS-PDI-AA15B-11.0-11.5/, NFS-PDI-AA15B-11.0-11.5X (JC31800-4/-5R)	NFS-PDI-BB15B-10.0-10.5 (JC31800-16) NFS-PDI-BB15B-8.0-8.5 (JC31800-27)	NFS-PDI-AA15B-10.0-10.5 (JC31800-2) NFS-PDI-AA15B-12.0-12.5 (JC31800-6) NFS-PDI-AA15B-14.0-14.5 (JC31800-7) NFS-PDI-AA15B-14.0-14.5 (JC31800-8) NFS-PDI-AA15B-18.0-18.5 (JC31800-9) NFS-PDI-AA15B-20.0-20.5 (JC31800-11) NFS-PDI-AA15B-4.0-4.5 (JC31800-12) NFS-PDI-AA15B-6.0-6.5 (JC31800-13) NFS-PDI-AA15B-8.0-8.5 (JC31800-14) NFS-PDI-BB15B-0.5-1.0 (JC31800-15)
NFS-PDI-BB15B-4.0-4.5/ NFS-PDI-BB15B-4.0-4.5X (JC31800-23R/-24)	NFS-PDI-AA15B-0.5-1.0 (JC31800-1) NFS-PDI-AA15B-2.0-2.5 (JC31800-10)	NFS-PDI-BB15B-12.0-12.5 (JC31800-17) NFS-PDI-BB15B-14.0-14.5 (JC31800-18) NFS-PDI-BB15B-16.0-16.5 (JC31800-19) NFS-PDI-BB15B-18.0-18.5 (JC31800-20) NFS-PDI-BB15B-2.0-2.5 (JC31800-21) NFS-PDI-BB15B-20.0-20.5 (JC31800-22)
NFS-PDI-X16BR-18.0-18.5/ NFS-PDI-X16BR-18.0-18.5X (JC31800-30/-31R)	NFS-PDI-AA15B-10.5-11.0 (JC31800-3) NFS-PDI-X16BR-18.5-19.0 (JC31800-32)	NFS-PDI-BB15B-6.0-6.5 (JC31800-25) NFS-PDI-BB15B-7.5-8.0 (JC31800-26) NFS-PDI-X16BR-0.5-1.0 (JC31800-29) NFS-PDI-X16BR-2.0-2.5 (JC31800-33) NFS-PDI-X16BR-4.0-4.5 (JC31800-36)

The two field duplicate pairs, NFS-PDI-AA15B-11.0-11.5/, NFS-PDI-AA15B-11.0-11.5X (JC31800-4/-5R) and NFS-PDI-BB15B-4.0-4.5/ NFS-PDI-BB15B-4.0-4.5X (JC31800-23R/-24), met all QC criteria; therefore, no qualifications were made.

The relative percent difference for the reported hexavalent chromium field duplicate results in the field duplicate pair, NFS-PDI-X16BR-18.0-18.5 (JC31800-30) & NFS-PDI-X16BR-18.0-18.5X (JC31800-31R), associated with samples as noted above, exceeded the QC acceptance RPD; therefore, the reported hexavalent chromium results in the samples associated by matrix were qualified as estimated (J). As the samples associated by batch were associated with both the field duplicate pairs, NFS-PDI-BB15B-4.0-4.5/ NFS-PDI-BB15B-4.0-4.5X and NFS-PDI-X16BR-18.0-18.5 & NFS-PDI-X16BR-18.0-18.5X, all of the samples associated by batch were estimated (J) based on the poor field duplicate precision of samples NFS-PDI-X16BR-18.0-18.5 & NFS-PDI-X16BR-18.0-18.5X.

Sample Results

Reported results (flagged B by the laboratory) that were less than the reporting limit (RL), but greater than or equal to the method detection limit (MDL) are approximate values and have been qualified as estimated (J).

Data Quality and Usability

In general, these data appear to be valid and may be used for decision-making purposes. No data were rejected. Qualified results, if applicable, are presented in Attachments A and B.

The hexavalent chromium soil results in this SDG are usable as estimated values with the potential for low bias due to low soluble MS and or PDS recovery, and since the MS sample matrix appears to be reducing based on the Eh-pH plot and/or the presence of TOC and ferrous iron.

Sample results qualified due to poor laboratory duplicate precision and or field duplicate precision are usable as estimated values with an unknown directional bias.

Sample results reported between the MDL and RL are usable as estimated values with an unknown directional bias.

ATTACHMENTS

Attachment A: Target Analyte Summary Hitlist(s)

Attachment B: Data Validation Report Form

Attachment A

Target Analyte Summary Hitlist(s)

Soil Target Analyte Summary Hit List (Hexavalent Chromium)

Site Name PPG - North Forest Street PDI
Sampling Date November 15, 2016
Lab Name/ID SGS/Accutest, Dayton, NJ
SDG No JC31800 and JC31800R
Sample Matrix Soil
Trip Blank ID NA
Field Blank ID NFS-PDI-FB20161115

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
NFS-PDI-AA15B-0.5-1.0	JC31800-1	CHROMIUM (HEXAVALENT)	U	8.7	8.7	0.52	Qualify	1,3
NFS-PDI-AA15B-10.0-10.5	JC31800-2	CHROMIUM (HEXAVALENT)	U	U	U	0.52	Qualify	1,3
NFS-PDI-AA15B-10.5-11.0	JC31800-3	CHROMIUM (HEXAVALENT)	U	0.80	0.80	0.47	Qualify	1,3,4
NFS-PDI-AA15B-11.0-11.5	JC31800-4	CHROMIUM (HEXAVALENT)	U	U	U	0.48	Qualify	1,3
NFS-PDI-AA15B-11.0-11.5X	JC31800-5R	CHROMIUM (HEXAVALENT)	U	0.43B	0.43	0.49	Qualify	1,3,5
NFS-PDI-AA15B-12.0-12.5	JC31800-6R	CHROMIUM (HEXAVALENT)	U	0.50	0.50	0.49	Qualify	1,3
NFS-PDI-AA15B-14.0-14.5	JC31800-7	CHROMIUM (HEXAVALENT)	U	U	U	0.47	Qualify	1,3
NFS-PDI-AA15B-16.0-16.5	JC31800-8	CHROMIUM (HEXAVALENT)	U	U	U	0.49	Qualify	1,3
NFS-PDI-AA15B-18.0-18.5	JC31800-9	CHROMIUM (HEXAVALENT)	U	U	U	0.45	Qualify	1,3
NFS-PDI-AA15B-2.0-2.5	JC31800-10	CHROMIUM (HEXAVALENT)	U	3.4	3.4	0.48	Qualify	1,3
NFS-PDI-AA15B-20.0-20.5	JC31800-11	CHROMIUM (HEXAVALENT)	U	0.56	0.56	0.45	Qualify	1,3
NFS-PDI-AA15B-4.0-4.5	JC31800-12R	CHROMIUM (HEXAVALENT)	U	0.52	0.52	0.46	Qualify	1,3
NFS-PDI-AA15B-6.0-6.5	JC31800-13R	CHROMIUM (HEXAVALENT)	U	0.77	0.77	0.55	Qualify	1,3
NFS-PDI-AA15B-8.0-8.5	JC31800-14	CHROMIUM (HEXAVALENT)	U	U	U	0.49	Qualify	1,3
NFS-PDI-BB15B-0.5-1.0	JC31800-15	CHROMIUM (HEXAVALENT)	U	0.35B	0.35	0.46	Qualify	1,3,5
NFS-PDI-BB15B-10.0-10.5	JC31800-16R	CHROMIUM (HEXAVALENT)	U	0.51	0.51	0.49	Qualify	1,3
NFS-PDI-BB15B-12.0-12.5	JC31800-17	CHROMIUM (HEXAVALENT)	U	U	U	0.52	Qualify	1,2,4

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
NFS-PDI-BB15B-14.0-14.5	JC31800-18R	CHROMIUM (HEXAVALENT)	U	0.71	0.71	0.45	Qualify	1,2,4
NFS-PDI-BB15B-16.0-16.5	JC31800-19	CHROMIUM (HEXAVALENT)	U	2.2	2.2	0.50	Qualify	1,2,4
NFS-PDI-BB15B-18.0-18.5	JC31800-20	CHROMIUM (HEXAVALENT)	U	U	U	0.45	Qualify	1,2,4
NFS-PDI-BB15B-2.0-2.5	JC31800-21	CHROMIUM (HEXAVALENT)	U	U	U	0.44	Qualify	1,2,4
NFS-PDI-BB15B-20.0-20.5	JC31800-22	CHROMIUM (HEXAVALENT)	U	0.45B	0.45	0.46	Qualify	1,2,4,5
NFS-PDI-BB15B-4.0-4.5	JC31800-23R	CHROMIUM (HEXAVALENT)	U	0.41B	0.41	0.49	Qualify	1,2,5
NFS-PDI-BB15B-4.0-4.5X	JC31800-24	CHROMIUM (HEXAVALENT)	U	U	U	0.48	Qualify	1,2
NFS-PDI-BB15B-6.0-6.5	JC31800-25R	CHROMIUM (HEXAVALENT)	U	0.46B	0.46	0.52	Qualify	1,2,4,5
NFS-PDI-BB15B-7.5-8.0	JC31800-26	CHROMIUM (HEXAVALENT)	U	U	U	0.53	Qualify	1,2,4
NFS-PDI-BB15B-8.0-8.5	JC31800-27R	CHROMIUM (HEXAVALENT)	U	0.46B	0.46	0.50	Qualify	1,2,5
NFS-PDI-X16BR-0.5-1.0	JC31800-29R	CHROMIUM (HEXAVALENT)	U	2.7	2.7	0.44	Qualify	1,2,4
NFS-PDI-X16BR-18.0-18.5	JC31800-30	CHROMIUM (HEXAVALENT)	U	1.4	1.4	0.54	Qualify	1,2,4
NFS-PDI-X16BR-18.0-18.5X	JC31800-31R	CHROMIUM (HEXAVALENT)	U	4.9	4.9	0.59	Qualify	1,2,4
NFS-PDI-X16BR-18.5-19.0	JC31800-32	CHROMIUM (HEXAVALENT)	U	U	U	0.53	Qualify	1,2,4
NFS-PDI-X16BR-2.0-2.5	JC31800-33	CHROMIUM (HEXAVALENT)	U	0.39B	0.39	0.44	Qualify	1,2,4,5
NFS-PDI-X16BR-4.0-4.5	JC31800-36R	CHROMIUM (HEXAVALENT)	U	0.90	0.90	0.44	Qualify	1,2,4

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

NJDEP Laboratory Footnote

1. The reported value was qualified because the soluble and/or insoluble matrix recoveries were less than 75%, but greater than 50%.
2. The reported value was qualified because the PDS recovery was less than 85 percent.
3. In the Duplicate Sample Analysis, Hexavalent Chromium fell outside the control limits of $\leq 20\%$ for sample results $> 4xRL$ or $\pm RL$ for sample results $< 4xRL$. Therefore, the result was qualified.

4. In the Field Duplicate Sample Analysis, Hexavalent Chromium fell outside the control limits of $\leq 20\%$ for sample results $> 4 \times \text{RL}$ or $\pm \text{RL}$ for sample results $< 4 \times \text{RL}$. Therefore, the result was qualified.
5. The reported result was greater than the MDL but less than the RL and therefore was estimated.

Attachment B

Data Validation Report Form

Client Name: PPG Industries	Project Number: 60314351.GA.DE.PDI.NFS
Site Location: PPG - North Forest Street PDI , Jersey City, NJ	Project Manager: Aimee Ruitter
Laboratory: SGS/Accutest, Dayton, NJ	Type of Validation: Full
Laboratory Job No: JC31800 and JC31800R	Date Checked: 12/8/16
Validator: Charlene Livingston Flint	Peer: Mary Kozik

ITEM	YES	NO	N/A	COMMENTS
Sample results included?	X			
Reporting Limits met project requirements?	X			
Field I.D. included?	X			
Laboratory I.D. included?	X			
Did data package sample IDs match sample IDs on COC?	X			
Did electronic data deliverable (EDD) sample IDs match COC sample IDs?	X			
Did data package sample IDs match electronic data deliverable (EDD) sample IDs?	X			
Sample matrix included?	X			
Sample receipt temperature 2-6°C?	X			4.9°C
Signed COCs included?	X			Initial relinquished by signature is not dated. No qualifications made.
Date of sample collection included?	X			
Date of sample digestion included?	X			
Holding time to digestion met criteria? (Soils -30 days from collection to digestion.)	X			
Date of analysis included?	X			
Holding time to analysis met criteria? (Soils -168 hours from digestion to analysis; Aqueous - 24 hours from collection to analysis.)	X			
Method reference included?	X			
Laboratory Case Narrative included?	X			

Definitions: MDL - Method Detection Limit; %R - Percent Recovery; RL - Reporting Limit; RPD - Relative Percent Difference; RSD - Relative Standard Deviation :Corr - Correlation Coefficient.

ITEM	YES	NO	N/A	COMMENTS
Initial calibration documentation included in lab package?	X			There were two sets of initial calibration included in the "R" data package. Data is reported from the 11/29/16 analysis.
1) Blank plus 4 standards (7196A) or blank plus 3 standards (7199)	X			
2) Correlation coefficient of =0.995 (7196A) or =0.999 (7199)	X			
3) Calibrate daily or each time instrument is set up.	X			
Calibration Check Standard (CCS) for 7196A and Quality Control Sample (QCS) for 7199 Included in Lab Package?	X			
1) %R criteria met? (90 - 110%)	X			
2) Correct frequency of one per every 10 samples	X			
3) CCS and QCS from independent source and at mid- level of calibration curve	X			
Calibration Blanks	X			
1) Analyzed prior to initial calibration standards and after each CCS/QCS?	X			
2) Absolute value should not exceed MDL.	X			
Method Blank, Field Blanks and/or Equipment Blanks Included in Lab Package?	X			NFS-PDI-FB20161115
1) Method blank analyzed with each preparation batch?	X			
2) Absolute value should not exceed MDL.	X			
Eh and pH Data	X			
1) Eh and pH data was included and plotted for all samples?	X			
Soluble Matrix Spike Data Included in Lab Package?	X			2 Sets. JC31800-1, -1R and JC31800-25, -25R
1) Soluble Matrix %R criteria met? (75-125%R).		X		See table.
2) Was the spike concentration 40 mg/Kg or twice the sample concentration?		X		Spiked at 53.3, 52.2, 52.3 and 51.9 mg/kg. No impact on data.
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	X			
Insoluble Matrix Spike Data Included in Lab Package?	X			
1) Insoluble Matrix %R criteria met? (75-125%R).		X		See table.
2) Was the spike concentration around 400 to 800 mg/Kg?		X		Spiked at 1350, 848, 1270 and 1110 mg/kg. No impact on data.
3) Was a sample spiked at the frequency of 1 per batch or 20	X			

samples?				
Post Digestion Spike	X			
1) Post Digestion Spike %R criteria met? (85-115%R).		X		See table.
2) Was the spike concentration 40 mg/Kg or twice the sample concentration?	X			
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	X			
Sample Duplicate Data Included in Lab Package?	X			2 Sets. JC31800-1, -1R and JC31800-25, -25R
1) RPD criteria met? (RPD < 20%) if both results are $\geq 4x$ RL or control limit of \pm RL if both results are $< 4xRL$.		X		See table.
2) Was a sample duplicate analyzed at the frequency of 1 per batch or 20 samples?	X			
Was a Laboratory Control Sample (LCS) Included in Lab Package?	X			
1) %R criteria met? (80-120%R).	X			
2) Was an LCS analyzed at the frequency of 1/batch or 20 samples?	X			
Were any Field Duplicate samples submitted with this SDG?	X			3 sets. JC31800-4 & -5, JC31800-23 & -24, and JC31800-30 & -31 See table
1) RPD criteria met? (RPD < 20%) if both results are $\geq 4x$ RL or control limit of \pm RL if both results are $< 4xRL$.		X		See tables.
Were all sample quantitation and reporting requirements met?	X			
1) Were all solid samples reported with percent solids > 50%?	X			
2) Were any samples analyzed or reported with dilutions?		X		
Miscellaneous Items	X			
1) For soils by 7196A, was the pH within a range of 7.0-8.0?	X			
2) For soils by 7199, was the pH within a range of 9.0-9.5?			X	
3) For aqueous by 7196A, was the pH with a range of 1.5-2.5?	X			
4) For soils (3060A), was the digestion temperature 90-95C for at least 60 minutes?	X			
5) For 7199, was each sample injected twice and was the RPD ≤ 20 ?			X	

Matrix Spikes

Sample ID	Lab ID	Analyte	Matrix Spike	% Recovery	Lower Limit	Upper Limit	PDS%	PDS Limit %
NFS-PDI-AA15B-0.5-1.0	JC31800-1	CHROMIUM (HEXAVALENT)	Soluble	37.0	75	125	88.13	85-115
NFS-PDI-AA15B-0.5-1.0	JC31800-1	CHROMIUM (HEXAVALENT)	Insoluble	85.7	75	125		
NFS-PDI-AA15B-0.5-1.0	JC31800-1R	CHROMIUM (HEXAVALENT)	Soluble	63.0	75	125	85	85-115
NFS-PDI-AA15B-0.5-1.0	JC31800-1R	CHROMIUM (HEXAVALENT)	Insoluble	80.6	75	125		
NFS-PDI-BB15B-6.0-6.5	JC31800-25	CHROMIUM (HEXAVALENT)	Soluble	1.0	75	125	33.43, pH adjusted 46.46	85-115
NFS-PDI-BB15B-6.0-6.5	JC31800-25	CHROMIUM (HEXAVALENT)	Insoluble	61.5	75	125		
NFS-PDI-BB15B-6.0-6.5	JC31800-25R	CHROMIUM (HEXAVALENT)	Soluble	11.3	75	125	54, pH adjusted 44	85-115
NFS-PDI-BB15B-6.0-6.5	JC31800-25R	CHROMIUM (HEXAVALENT)	Insoluble	51.5	75	125		

Lab Duplicates

Sample ID	Lab ID	Analyte	Sample Result	Qual	Duplicate Result	Qual	QL	Units	RPD	Action
NFS-PDI-AA15B-0.5-1.0	JC31800-1	CHROMIUM (HEXAVALENT)	8.7		14.8		0.52	mg/kg	51.9	SR>4xRL, RPD>20% Estimate (J/UJ)
NFS-PDI-AA15B-0.5-1.0	JC31800-1R	CHROMIUM (HEXAVALENT)	3.1		1.7		0.52	mg/kg	58.3	SR>4xRL, RPD>20% Estimate (J/UJ)
NFS-PDI-BB15B-6.0-6.5	JC31800-25	CHROMIUM (HEXAVALENT)	0.37	U	0	U	0.52	mg/kg	0	OK
NFS-PDI-BB15B-6.0-6.5	JC31800-25R	CHROMIUM (HEXAVALENT)	0.46	J	0.55		0.52	mg/kg	17.8	OK

Field Duplicates

Sample ID	Duplicate ID	Lab ID	Analyte	Sample Result	Qual	Duplicate Result	Qual	QL	Units	RPD	Action
NFS-PDI-AA15B-11.0-11.5	NFS-PDI-AA15B-11.0-11.5X	JC31800-4/5R	CHROMIUM (HEXAVALENT)	0.48	U	0.43	J	0.48	mg/kg	11.0	Accept, SR ND or <RL
NFS-PDI-BB15B-4.0-4.5	NFS-PDI-BB15B-4.0-4.5X	JC31800-23R/24	CHROMIUM (HEXAVALENT)	0.41		0.48	U	0.49	mg/kg	15.7	Accept, SR ND or <RL
NFS-PDI-X16BR-18.0-18.5	NFS-PDI-X16BR-18.0-18.5X	JC31800-30/31R	CHROMIUM (HEXAVALENT)	1.4		4.9		0.54	mg/kg	111.1	SR>4xRL, RPD>20% Estimate (J/UJ)

Percent Solids

Sample ID	Percent Solids (%)	Status
NFS-PDI-BB15B-6.0-6.5	76.2	ok @50%
NFS-PDI-BB15B-7.5-8.0	75	ok @50%
NFS-PDI-BB15B-8.0-8.5	80.5	ok @50%
NFS-PDI-X16BR-0.5-1.0	90.1	ok @50%
NFS-PDI-X16BR-18.0-18.5	73.5	ok @50%
NFS-PDI-X16BR-18.0-18.5X	67.5	ok @50%
NFS-PDI-X16BR-18.5-19.0	75.6	ok @50%
NFS-PDI-X16BR-2.0-2.5	91.3	ok @50%
NFS-PDI-X16BR-4.0-4.5	90	ok @50%
NFS-PDI-AA15B-0.5-1.0	76.9	ok @50%
NFS-PDI-AA15B-10.0-10.5	76.4	ok @50%
NFS-PDI-AA15B-10.5-11.0	84.4	ok @50%
NFS-PDI-AA15B-11.0-11.5	83.2	ok @50%

Sample ID	Percent Solids (%)	Status
NFS-PDI-AA15B-11.0-11.5X	82	ok @50%
NFS-PDI-AA15B-12.0-12.5	81.9	ok @50%
NFS-PDI-AA15B-14.0-14.5	85.9	ok @50%
NFS-PDI-AA15B-16.0-16.5	82.2	ok @50%
NFS-PDI-AA15B-18.0-18.5	89	ok @50%
NFS-PDI-AA15B-2.0-2.5	84.2	ok @50%
NFS-PDI-AA15B-20.0-20.5	89.7	ok @50%
NFS-PDI-AA15B-4.0-4.5	87.1	ok @50%
NFS-PDI-AA15B-6.0-6.5	72.7	ok @50%
NFS-PDI-AA15B-8.0-8.5	81.7	ok @50%
NFS-PDI-BB15B-0.5-1.0	87.6	ok @50%
NFS-PDI-BB15B-10.0-10.5	82.3	ok @50%
NFS-PDI-BB15B-12.0-12.5	76.7	ok @50%
NFS-PDI-BB15B-14.0-14.5	88.5	ok @50%
NFS-PDI-BB15B-16.0-16.5	79.6	ok @50%
NFS-PDI-BB15B-18.0-18.5	88.2	ok @50%
NFS-PDI-BB15B-2.0-2.5	90.2	ok @50%
NFS-PDI-BB15B-20.0-20.5	87.2	ok @50%
NFS-PDI-BB15B-4.0-4.5	82.2	ok @50%
NFS-PDI-BB15B-4.0-4.5X	82.7	ok @50%

SDG#: JC31800/ Method 7196

Batch: GN55334

Cr+6 ICAL 11/18/16

Soil

(p. 103 of data pkg)

x - concentration	y - response
0	0
0.01	0.009
0.05	0.041
0.1	0.081
0.3	0.241
0.5	0.415
0.8	0.666
1	0.815

(p. 103
of data
pkg)

AECOM Calculated Offset	-0.0001	OK	Reported Offset	-0.0001
AECOM Slope	0.8222	OK	Reported Slope	0.8222
AECOM Calculated r	0.99988	OK	Reported r	0.99988

LCS calculation

GP1488-B1

P. 75,103

Background Absorbance	0
Total absorbance	0.731
Total absorbance - background	0.731
Instrument Concentration	0.889
Sample weight (mg/kg)	0.0025
Final Volume (L)	0.1
Dilution Factor	1

AECOM Calculated LCS Result (mg/Kg)	35.6	OK	Reported Result (mg/Kg)	35.6
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%R = Found/True*100

GP1488-B1

P. 75,103

True Value (mg/kg)	40
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AECOM Calculated %R	88.9	OK, rounding	Reported %R	89.0
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MS calculation

GP1488-S1

P. 77,78,103

JC31800-1

Background reading	0.007
Total absorbance	0.445
Total absorbance - background	0.438
Instrument Concentration	0.5329
Sample weight (mg/kg)	0.00244
Final Volume (L)	0.1
Percent solids	0.769
Dilution Factor	1

AECOM Calculated MS Result (mg/Kg)	28.4	OK	Reported Result (mg/Kg)	28.4
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%R = Found/True*100

GP1488-S1

P. 77,78,103

JC31800-1

True Value (mg/kg)	53.3
Native concentration (mg/Kg)	8.7

AECOM%R	37.0	OK	Reported %R	37.0
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Percent Solids

JC31800-1

P. 78

NFS-PDI-AA15B-0.5-1.0

Empty dish weight= 23.54
 Wet weight= 29.47
 Dry weight= 28.1

AECOM %solids =	76.9	OK	Reported %solids=	76.9
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Reporting Limit	JC31800-1	P. 15,78,103	NFS-PDI-AA15B-0.5-1.0
Low Standard	0.01		
Initial weight (mg/kg)	0.00257		
Final volume (L)	0.1		
Percent solids	0.769		
Dilution Factor	1		

Reporting Limit	0.51	OK, rounding	Reported RL (mg/Kg)=	0.52
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Sample Calculations	JC31800-1	P. 15,78,103	NFS-PDI-AA15B-0.5-1.0
Background reading	0.01		
Total absorbance	0.151		
Total absorbance - background	0.141		
Instrument Response	0.172		
Sample weight (mg/kg)	0.00257		
Final Volume (L)	0.1		
Percent solids	0.769		
Dilution Factor	1		

AECOM Calculated Result (mg/Kg)	8.7	OK	Reported Result (mg/Kg)	8.7
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Associated with samples JC31800-1 through JC31800-16

SDG#: JC31800/ Method 7196

Batch: GN55346

Cr+6 ICAL 11/18/16

Soil

(p. 112 of data pkg)

x - concentration	y - response
0	0
0.01	0.009
0.05	0.041
0.1	0.081
0.3	0.241
0.5	0.415
0.8	0.666
1	0.815

(p. 112 of data pkg)

AECOM Calculated Offset	-0.0001	OK	Reported Offset	-0.0001
AECOM Slope	0.8222	OK	Reported Slope	0.8222
AECOM Calculated r	0.99988	OK	Reported r	0.99988

LCS calculation

GP1493-B1

P. 75,112

Background Absorbance	0
Total absorbance	0.776
Total absorbance - background	0.776
Instrument Concentration	0.944
Sample weight (mg/kg)	0.0025
Final Volume (L)	0.1
Dilution Factor	1

AECOM Calculated LCS Result (mg/Kg)	37.8	OK	Reported Result (mg/Kg)	37.8
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%R = Found/True*100

GP1493-B1

P. 75,112

True Value (mg/kg)	40
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AECOM Calculated %R	94.4	OK, rounding	Reported %R	94.5
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MS calculation

GP1493-S1

P. 77,82,112

JC31800-25

Background reading	0.026
Total absorbance	0.034
Total absorbance - background	0.008
Instrument Concentration	0.0099
Sample weight (mg/kg)	0.00251
Final Volume (L)	0.1
Percent solids	0.762
Dilution Factor	1

AECOM Calculated MS Result (mg/Kg)	0.52	OK	Reported Result (mg/Kg)	0.52
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%R = Found/True*100

GP1493-S1

P. 77,82,112

JC31800-25

True Value (mg/kg)	52.3
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Native concentration (mg/Kg)	0
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AECOM %R	0.99	OK, rounding	Reported %R	1.0
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Percent Solids	JC31800-25	P. 82	NFS-PDI-BB15B-6.0-6.5
Empty dish weight=	19.89		
Wet weight=	26.40		
Dry weight=	24.85		
AECOM %solids =	76.2	OK	Reported %solids= 76.2

Reporting Limit	JC31800-25	P. 39,82,112	NFS-PDI-BB15B-6.0-6.5
Low Standard	0.01		
Initial weight (mg/kg)	0.00242		
Final volume (L)	0.1		
Percent solids	0.762		
Dilution Factor	1		
Reporting Limit	0.54	OK, rounding	Reported RL (mg/Kg)= 0.52

Sample Calculations	JC31800-25	P. 39,82,112	NFS-PDI-BB15B-6.0-6.5
Background reading	0.024		
Total absorbance	0.028		
Total absorbance - background	0.004		
Instrument Response	0.005		
Sample weight (mg/kg)	0.00242		
Final Volume (L)	0.1		
Percent solids	0.762		
Dilution Factor	1		
AECOM Calculated Result (mg/Kg)	0.27	OK, <MDL, ND	Reported Result (mg/Kg) 0.37 U

Associated with samples JC31800-17 through JC31800-36

SDG#: JC31800R/ Method 7196

Batch: GN55706

Cr+6 ICAL 11/29/16

Soil

(p. 141 of data pkg)

x - concentration	y - response
0	0
0.01	0.01
0.05	0.044
0.1	0.09
0.3	0.266
0.5	0.412
0.8	0.655
1	0.845

(p. 141
of data
pkg)

AECOM Calculated Offset	0.0034	OK	Reported Offset	0.0034
AECOM Slope	0.8314	OK	Reported Slope	0.8314
AECOM Calculated r	0.99963	OK	Reported r	0.99963

LCS calculation

GP1698-B1

P. 70,141

Background Absorbance	0
Total absorbance	0.776
Total absorbance - background	0.776
Instrument Concentration	0.929
Sample weight (mg/kg)	0.0025
Final Volume (L)	0.1
Dilution Factor	1

AECOM Calculated LCS Result (mg/Kg)	37.2	OK	Reported Result (mg/Kg)	37.2
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%R = Found/True*100

GP1698-B1

P. 70,141

True Value (mg/kg)	40
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AECOM Calculated %R	92.9	OK, rounding	Reported %R	93.0
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MS calculation

GP1698-S1

P. 72,78,141

JC31800-1R

Background reading	0.025
Total absorbance	0.602
Total absorbance - background	0.577
Instrument Concentration	0.6899
Sample weight (mg/kg)	0.00249
Final Volume (L)	0.1
Percent solids	0.769
Dilution Factor	1

AECOM Calculated MS Result (mg/Kg)	36.0	OK	Reported Result (mg/Kg)	36.0
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%R = Found/True*100

GP1698-S1

P. 72,78,141

JC31800-1R

True Value (mg/kg)	52.2
Native concentration (mg/Kg)	3.1

AECOM%R	63.1	OK, rounding	Reported %R	63.0
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Percent Solids	JC31800-1R	P. 78	NFS-PDI-AA15B-0.5-1.0
Empty dish weight=	23.54		
Wet weight=	29.47		
Dry weight=	28.1		
AECOM %solids =	76.9	OK	Reported %solids= 76.9

Reporting Limit	JC31800-1R	P. 14,78,141	NFS-PDI-AA15B-0.5-1.0
Low Standard	0.01		
Initial weight (mg/kg)	0.00252		
Final volume (L)	0.1		
Percent solids	0.769		
Dilution Factor	1		
Reporting Limit	0.52	OK	Reported RL (mg/Kg)= 0.52

Sample Calculations	JC31800-1R	P. 14,78,141	NFS-PDI-AA15B-0.5-1.0
Background reading	0.015		
Total absorbance	0.069		
Total absorbance - background	0.054		
Instrument Response	0.061		
Sample weight (mg/kg)	0.00252		
Final Volume (L)	0.1		
Percent solids	0.769		
Dilution Factor	1		
AECOM Calculated Result (mg/Kg)	3.1	OK	Reported Result (mg/Kg) 3.1

Associated with samples JC31800-1R through JC31800-16R

SDG#: JC31800R/ Method 7196

Batch: GN55730

Cr+6 ICAL 11/29/16

Soil

(p. 149 of data pkg)

x - concentration	y - response
0	0
0.01	0.008
0.05	0.044
0.1	0.085
0.3	0.248
0.5	0.408
0.8	0.653
1	0.836

(p. 149
of data
pkg)

AECOM Calculated Offset	-0.00002	OK	Reported Offset	0.00002
AECOM Slope	0.8269	OK	Reported Slope	0.8269
AECOM Calculated r	0.99986	OK	Reported r	0.99986

LCS calculation

GP1700-B1

P. 70,149

Background Absorbance	0
Total absorbance	0.692
Total absorbance - background	0.692
Instrument Concentration	0.837
Sample weight (mg/kg)	0.0025
Final Volume (L)	0.1
Dilution Factor	1

AECOM Calculated LCS Result (mg/Kg)	33.5	OK	Reported Result (mg/Kg)	33.5
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%R = Found/True*100

GP1700-B1

P. 70,149

True Value (mg/kg)	40
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AECOM Calculated %R	83.7	OK, rounding	Reported %R	83.8
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MS calculation

GP1700-S1

P. 72,82,149

JC31800-25R

Background reading	0.028
Total absorbance	0.129
Total absorbance - background	0.101
Instrument Concentration	0.1222
Sample weight (mg/kg)	0.00253
Final Volume (L)	0.1
Percent solids	0.762
Dilution Factor	1

AECOM Calculated MS Result (mg/Kg)	6.3	OK	Reported Result (mg/Kg)	6.3
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%R = Found/True*100

GP1700-S1

P. 72,82,149

JC31800-25R

True Value (mg/kg)	51.9
Native concentration (mg/Kg)	0.46

AECOM%R	11.3	OK	Reported %R	11.3
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Percent Solids	JC31800-25R	P. 82	NFS-PDI-BB15B-6.0-6.5
Empty dish weight=	19.89		
Wet weight=	26.40		
Dry weight=	24.85		
AECOM %solids =	76.2	OK	Reported %solids= 76.2

Reporting Limit	JC31800-25R	P. 38,82,149	NFS-PDI-BB15B-6.0-6.5
Low Standard	0.01		
Initial weight (mg/kg)	0.00241		
Final volume (L)	0.1		
Percent solids	0.762		
Dilution Factor	1		
Reporting Limit	0.54	OK, rounding	Reported RL (mg/Kg)= 0.52

Sample Calculations	JC31800-25R	P. 38,82,149	NFS-PDI-BB15B-6.0-6.5
Background reading	0.039		
Total absorbance	0.046		
Total absorbance - background	0.007		
Instrument Response	0.008		
Sample weight (mg/kg)	0.00241		
Final Volume (L)	0.1		
Percent solids	0.762		
Dilution Factor	1		
AECOM Calculated Result (mg/Kg)	0.46	OK	Reported Result (mg/Kg) 0.46 B

Associated with samples JC31800-17R through JC31800-36R

Data Validation Report

Project:	PPG - North Forest Street PDI		
Laboratory:	SGS/Accutest, Dayton, NJ		
Laboratory Job No.:	JC31880 and JC31880R		
Analysis/Method:	Hexavalent Chromium SW846 3060A/7196A		
Validation Level:	Full (Hexavalent Chromium)		
Site Location/Address:	70 Carteret Avenue, Jersey City, NJ		
AECOM Project No:	60314351.GA.DE.PDI.NFS		
Prepared by:	Sharon McKechnie /AECOM	Completed on:	12/07/2016
Reviewed by:	Mary Kozik/ AECOM	File Name:	JC31880_R_2016_12_07_DV Report-F

Introduction

The data were reviewed in accordance with the FSP-QAPP and the following NJDEP and/or Region 2 validation Standard Operating Procedure(s) (SOP):

- NJDEP Office of Data Quality SOP 5.A.10, Rev 3 (September 2009), SOP for Analytical Data Validation of Hexavalent Chromium - for USEPA SW-846 Method 3060A, USEPA SW-846 Method 7196A

The results of quality control data analyzed with site samples were used to assess the overall reliability of the data. The following qualifiers were used to identify data quality issues:

- U: Indicates the analyte was not detected in the sample above the sample reporting limit.
- J: Indicates the result was an estimated value; the associated numerical value was an approximate concentration of the analyte in the sample.
- UJ: Indicates the analyte was not detected above the reporting limit and the reporting limit was approximate.
- UB: The analyte concentration is less than or equal to three (3) times the concentration in the associated method/prep blank. The presence of the analyte in the sample is negated (UB) due to laboratory contamination.
- JB: The analyte concentration is greater than three (3) times, but less than or equal to ten (10) times the concentration in the associated method/prep blank. The presence of that analyte in the sample is considered "real". The concentration is quantitatively qualified (JB) due to method blank contamination.

- R: The sample result was rejected due to serious deficiencies; the presence or absence of the analyte could not be confirmed.
- RA: The sample result was rejected due to NJ specific data validation QC requirements; however, the result is usable for project objectives. Refer to the Data Quality and Usability section in this data validation report for further discussion.

Sample Information

The samples listed below were collected by AECOM on November 16, 2016 as part of the PPG - North Forest Street PDI sampling at 70 Carteret Avenue, Jersey City, NJ. Only the samples and parameter listed below were validated.

Field ID	Laboratory ID	Matrix	Fraction
NFS-FB20161116 (Equipment Blank)	JC31880-1	Aqueous	Hexavalent Chromium
NFS-PDI-BB12B-0.5-1.0	JC31880-2,2R	Soil	Hexavalent Chromium
NFS-PDI-BB12B-10.0-10.5	JC31880-3,3R	Soil	Hexavalent Chromium
NFS-PDI-BB12B-12.0-12.5	JC31880-4,4R	Soil	Hexavalent Chromium
NFS-PDI-BB12B-14.0-14.5	JC31880-5,5R	Soil	Hexavalent Chromium
NFS-PDI-BB12B-16.0-16.5	JC31880-6,6R	Soil	Hexavalent Chromium
NFS-PDI-BB12B-18.0-18.5	JC31880-7,7R	Soil	Hexavalent Chromium
NFS-PDI-BB12B-2.0-2.5	JC31880-8,8R	Soil	Hexavalent Chromium
NFS-PDI-BB12B-20.0-20.5	JC31880-9,9R	Soil	Hexavalent Chromium
NFS-PDI-BB12B-4.0-4.5	JC31880-10,10R	Soil	Hexavalent Chromium
NFS-PDI-BB12B-6.0-6.5	JC31880-11,11R	Soil	Hexavalent Chromium
NFS-PDI-BB12B-7.0-7.5	JC31880-12,12R	Soil	Hexavalent Chromium
NFS-PDI-BB12B-7.5-8.0	JC31880-13,13R	Soil	Hexavalent Chromium
NFS-PDI-BB12B-8.0-8.5	JC31880-14,14R	Soil	Hexavalent Chromium
NFS-PDI-BB12B-8.0-8.5X (Field Duplicate of NFS-PDI-BB12B-8.0-8.5)	JC31880-15,15R	Soil	Hexavalent Chromium
NFS-PDI-T15BR-22.5-23.0	JC31880-16,16R	Soil	Hexavalent Chromium
NFS-PDI-T15BR-23.0-23.5	JC31880-17,17R	Soil	Hexavalent Chromium

The samples were collected following the procedures detailed in the Work Order for Garfield Avenue Remedial Action (GARA) at 70 Carteret Avenue and the Field Sampling Plan/Quality Assurance Project Plan for Non-Residential and Residential Chromium Sites Hudson County, New Jersey (December 2011).

General Comments

The data package was complete. Quality control (QC) issues identified during validation are discussed below. Refer to the Soil Target Analyte Summary Hitlist(s) in Attachment A for a listing of all detected results, qualified results, and associated qualifications, where applicable. The nonconformances for each section discussed below are presented in Attachment B.

MS Results

Sample NFS-PDI-BB12B-14.0-14.5 (JC31880-5) was selected for the matrix spike (MS) analysis associated with the samples in this SDG and used for supporting data quality recommendations. The soluble and insoluble MS results from the initial analysis were 38.1% and 92.8%, respectively. The soluble MS recovery did not meet QC criteria of 75-125%R, and was less than 50%. The post-digestion spike (PDS) recovery was 111%, which met the PDS criteria of 85-115%.

Based on the low MS recovery, the samples were reanalyzed using Method 7196. The soluble and insoluble MS recoveries from the reanalysis batch were 117.3% and 87.9%, respectively. Both MS recoveries met the QC criteria of 75-125%R. The PDS recovery was 94%, which met the PDS criteria of 85-115%.

Since the initial analysis soluble MS recovery failed to meet QC criteria, additional parameters were analyzed to determine if possible matrix interferences could be the cause for the poor MS recovery. All the samples were tested for pH and oxidation-reduction potential (ORP), and plotted on an Eh/pH phase diagram. From this chart, the source sample for the MS analysis was plotted above the phase change line, indicating an oxidizing potential within the sample matrix, capable of supporting hexavalent chromium. Ferrous iron, sulfide screen, and total organic carbon (TOC) were performed on this matrix spike source sample to confirm the oxidizing/reducing potential within the sample matrix. The sulfide screen was reported as nondetect, indicating no reducing agents within the sample matrix; however, the ferrous iron (0.27%) and the TOC results (361 mg/Kg) were positive, indicating potential reducing agents within the sample matrix.

Since the soluble MS recovery from the initial analysis did not meet the MS QC requirements, results reported from that analysis were qualified as estimated (J) with a possible low bias. Since the soluble and insoluble MS recoveries from the reanalysis were each >75%, the results reported from that analysis were accepted without qualification based on MS %Rs. The highest detected hexavalent chromium result or the nondetect hexavalent chromium result with the lowest RL was reported for each soil sample.

Laboratory Duplicate

The 20% relative percent difference (RPD) criteria for the laboratory duplicate (LD) analysis of sample NFS-PDI-BB12B-14.0-14.5 (JC31880-5) was exceeded in the initial and reanalysis. Therefore, all reported soil hexavalent chromium results were qualified as estimated (J/UJ) based on duplicate precision.

Laboratory duplicate sample NFS-PDI-BB12B-14.0-14.5 (JC31880-5) had a result that significantly differed from the LD result in the initial analysis, such that the sample result exceeded the project action limit of 20 mg/kg.

Refer to the Soil Target Analyte Summary Hitlist(s) in Attachment A for a listing of all results qualified on the basis of LD precision. Refer to the tables in Attachment B for a listing of LD results and associated qualification actions.

Field Duplicate

The 20% RPD criteria for the field duplicate (FD) pair NFS-PDI-BB12B-8.0-8.5 (JC31880-14) and NFS-PDI-BB12B-8.0-8.5X (JC31880-15) was exceeded; therefore, all reported soil hexavalent chromium results were qualified as estimated (J/UJ) based on duplicate precision.

Refer to the Soil Target Analyte Summary Hitlist(s) in Attachment A for a listing of all results qualified on the basis of FD precision. Refer to the tables in Attachment B for a listing of FD results and associated qualification actions.

Data Quality and Usability

In general, these data appear to be valid and may be used for decision-making purposes. No data were rejected. Qualified and detected results are presented in Attachments A and B.

The highest detected hexavalent chromium result or the nondetect result with the lowest RL was reported for each soil sample.

Issues noted:

- Results reported from the initial analysis are qualified as estimated due to the low soluble spike recovery associated with those results.
- Due to poor laboratory and field duplicate precision the reported hexavalent chromium results for all soil samples were estimated with an undefined bias.

ATTACHMENTS

Attachment A: Target Analyte Summary Hitlist(s)

Attachment B: Data Validation Report Form

Attachment A

Target Analyte Summary Hitlist(s)

Soil Target Analyte Summary Hit List (Hexavalent Chromium)

Site Name PPG - North Forest Street PDI
Sampling Date November 16, 2016
Lab Name/ID SGS/Accutest, Dayton, NJ
SDG No JC31880 and JC31880R
Sample Matrix Soil
Trip Blank ID NA
Field Blank ID NFS-FB20161116

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
NFS-PDI-BB12B-0.5-1.0	JC31880-2	CHROMIUM (HEXAVALENT)	U	1.2	1.2	0.45	Qualify	1,2
NFS-PDI-BB12B-10.0-10.5	JC31880-3	CHROMIUM (HEXAVALENT)	U	0.68	0.68	0.48	Qualify	1,2
NFS-PDI-BB12B-12.0-12.5	JC31880-4R	CHROMIUM (HEXAVALENT)	U	44.6	44.6	0.51	Qualify	1
NFS-PDI-BB12B-14.0-14.5	JC31880-5R	CHROMIUM (HEXAVALENT)	U	31.5	31.5	0.47	Qualify	1
NFS-PDI-BB12B-16.0-16.5	JC31880-6R	CHROMIUM (HEXAVALENT)	U	16.1	16.1	0.46	Qualify	1
NFS-PDI-BB12B-18.0-18.5	JC31880-7R	CHROMIUM (HEXAVALENT)	U	21.1	21.1	0.45	Qualify	1
NFS-PDI-BB12B-2.0-2.5	JC31880-8	CHROMIUM (HEXAVALENT)	U	2.5	2.5	0.49	Qualify	1,2
NFS-PDI-BB12B-20.0-20.5	JC31880-9	CHROMIUM (HEXAVALENT)	U	10.5	10.5	0.46	Qualify	1,2
NFS-PDI-BB12B-4.0-4.5	JC31880-10	CHROMIUM (HEXAVALENT)	U	1.6	1.6	0.46	Qualify	1,2
NFS-PDI-BB12B-6.0-6.5	JC31880-11	CHROMIUM (HEXAVALENT)	U	0.70	0.70	0.54	Qualify	1,2
NFS-PDI-BB12B-7.0-7.5	JC31880-12	CHROMIUM (HEXAVALENT)	U	2.9	2.9	0.54	Qualify	1,2
NFS-PDI-BB12B-7.5-8.0	JC31880-13	CHROMIUM (HEXAVALENT)	U	9.0	9.0	0.49	Qualify	1,2
NFS-PDI-BB12B-8.0-8.5	JC31880-14	CHROMIUM (HEXAVALENT)	U	66.7	66.7	2.7	Qualify	1,2
NFS-PDI-BB12B-8.0-8.5X	JC31880-15	CHROMIUM (HEXAVALENT)	U	84.8	84.8	2.6	Qualify	1,2
NFS-PDI-T15BR-22.5-23.0	JC31880-16R	CHROMIUM (HEXAVALENT)	U	4.0	4.0	0.47	Qualify	1
NFS-PDI-T15BR-23.0-23.5	JC31880-17	CHROMIUM (HEXAVALENT)	U	U	U	0.64	Qualify	1,2

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

NJDEP Laboratory Footnote

1. The sample result was qualified because the laboratory duplicate and field duplicate did not meet the RPD QC criteria for results greater than 4x the RL.
2. The result was qualified because the soluble MS recovery associated with the reported result was <75%

Attachment B

Data Validation Report Form

Client Name: PPG Industries	Project Number: 60314351.GA.DE.PDI.NFS
Site Location: PPG - North Forest Street PDI, Jersey City, NJ	Project Manager: Aimee Ruiter
Laboratory: SGS/Accutest, Dayton, NJ	Type of Validation: Full
Laboratory Job No JC31880 and JC31880R	Date Checked: 12/07/2016
Validator: Sharon McKechnie	Peer: Mary Kozik

ITEM	YES	NO	N/A	COMMENTS
Sample results included?	X			
Reporting Limits met project requirements?	X			
Field I.D. included?	X			
Laboratory I.D. included?	X			
Did data package sample IDs match sample IDs on COC?	X			
Did electronic data deliverable (EDD) sample IDs match COC sample IDs?	X			
Did data package sample IDs match electronic data deliverable (EDD) sample IDs?	X			
Sample matrix included?	X			
Sample receipt temperature 2-6°C?	X			
Signed COCs included?	X			
Date of sample collection included?	X			
Date of sample digestion included?	X			
Holding time to digestion met criteria? (Soils -30 days from collection to digestion.)	X			
Date of analysis included?	X			
Holding time to analysis met criteria? (Soils -168 hours from digestion to analysis; Aqueous - 24 hours from collection to analysis.)	X			
Method reference included?	X			
Laboratory Case Narrative included?	X			

Definitions: MDL - Method Detection Limit; %R - Percent Recovery; RL - Reporting Limit; RPD - Relative Percent Difference; RSD - Relative Standard Deviation ;Corr - Correlation Coefficient.

ITEM	YES	NO	N/A	COMMENTS
Initial calibration documentation included in lab package?	X			
1) Blank plus 4 standards (7196A) or blank plus 3 standards (7199)	X			
2) Correlation coefficient of >0.995 (7196A) or >0.999 (7199)	X			
3) Calibrate daily or each time instrument is set up.	X			
Calibration Check Standard (CCS) for 7196A and Quality Control Sample (QCS) for 7199 Included in Lab Package?	X			
1) %R criteria met? (90 - 110%)	X			
2) Correct frequency of one per every 10 samples	X			
3) CCS and QCS from independent source and at mid- level of calibration curve	X			
Calibration Blanks	X			
1) Analyzed prior to initial calibration standards and after each CCS/QCS?	X			
2) Absolute value should not exceed MDL.	X			
Method Blank, Field Blanks and/or Equipment Blanks Included in Lab Package?	X			
1) Method blank analyzed with each preparation batch?	X			
2) Absolute value should not exceed MDL.	X			
Eh and pH Data	X			
1) Eh and pH data was included and plotted for all samples?	X			
Soluble Matrix Spike Data Included in Lab Package?	X			JC31880-5/5R
1) Soluble Matrix %R criteria met? (75-125%R).	X*			*Initial no, rerun yes See Table
2) Was the spike concentration 40 mg/Kg or twice the sample concentration?		X		JC31880-5/5R initial and rerun spiked at 46.7 mg/kg and 45.6 mg/kg, respectively. The data was not affected.
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	X			
Insoluble Matrix Spike Data Included in Lab Package?	X			JC31880-5/5R
1) Insoluble Matrix %R criteria met? (75-125%R).	X			See Table
2) Was the spike concentration around 400 to 800 mg/Kg?	X			JC31880-5/5R initial and rerun spiked at 1310 mg/kg and 1280 mg/kg, respectively. The data was not affected.
Post Digestion Spike	X			JC31880-5/5R
1) Post Digestion Spike %R criteria met? (85-115%R).	X			See Table
2) Was the spike concentration 40 mg/Kg or twice the	X			

ITEM	YES	NO	N/A	COMMENTS
sample concentration?				
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	X			
Sample Duplicate Data Included in Lab Package?	X			JC31880-5/5R
1) RPD criteria met? (RPD < 20%) if both results are ≥4x RL or control limit of ± RL if both results are <4xRL.		X		See Table
2) Was a sample duplicate analyzed at the frequency of 1 per batch or 20 samples?	X			
Was a Laboratory Control Sample (LCS) Included in Lab Package?	X			
1) %R criteria met? (80-120%R).	X			
2) Was an LCS analyzed at the frequency of 1/batch or 20 samples?	X			
Were any Field Duplicate samples submitted with this SDG?	X			JC31880-14/15
1) RPD criteria met? (RPD < 20%) if both results are ≥4x RL or control limit of ± RL if both results are <4xRL.		X		See Table
Were all sample quantitation and reporting requirements met?	X			
1) Were all solid samples reported with percent solids > 50%?	X			No table
2) Were any samples analyzed or reported with dilutions?	X			
Miscellaneous Items	X			
1) For soils by 7196A, was the pH within a range of 7.0-8.0?	X			
2) For soils by 7199, was the pH within a range of 9.0-9.5?			X	
3) For aqueous by 7196A, was the pH with a range of 1.5-2.5?	X			
4) For soils (3060A), was the digestion temperature 90-95C for at least 60 minutes?	X			
5) For 7199, was each sample injected twice and was the RPD ≤20?			X	
Chromium result greater than corresponding hexavalent chromium result where applicable?			X	

Matrix Spikes

Sample ID	Lab ID	Analyte	Matrix Spike	% Recovery	Lower Limit	Upper Limit	PDS%	PDS Limits
NFS-PDI-BB12B-14.0-14.5	JC31880-5	CHROMIUM (HEXAVALENT)	Soluble	38.1	75	125	111	85-115
NFS-PDI-BB12B-14.0-14.5	JC31880-5	CHROMIUM (HEXAVALENT)	Insoluble	92.8				
NFS-PDI-BB12B-14.0-14.5	JC31880-5R	CHROMIUM (HEXAVALENT)	Soluble	117.3			94	
NFS-PDI-BB12B-14.0-14.5	JC31880-5R	CHROMIUM (HEXAVALENT)	Insoluble	87.9				

Lab Duplicates

Sample ID	Lab ID	Analyte	Sample Result	Duplicate Result	QL	Units	RPD (%)	Action/Applicable Samples*
NFS-PDI-BB12B-14.0-14.5	JC31880-5	CHROMIUM (HEXAVALENT)	21.8	9.7	0.47	mg/kg	76.8	Both >4XRL, RPD>20%; Estimate (J/UJ)
NFS-PDI-BB12B-14.0-14.5	JC31880-5R	CHROMIUM (HEXAVALENT)	31.5	44	0.47	mg/kg	33.1	Both >4XRL, RPD>20%; Estimate (J/UJ)

Field Duplicate NFS-PDI-BB12B-8.0-8.5/ NFS-PDI-BB12B-8.0-8.5X

Lab Sample ID	Result	RL	Dup Lab Sample ID	Dup Result	Dup RL	Units	RPD (%)	Action
JC31880-14	66.7	2.7	JC31880-15	84.8	2.6	mg/kg	23.9	Both results >4X RL, RPD>20%; Estimate (J/UJ)

SDG#: JC31880R/ Method 7196
Batch: GN55684
 Cr+6 ICAL 11/28/16
 Soil
 (p. 95 of data pkg)

x - concentration	y - response
0	0
0.01	0.009
0.05	0.044
0.1	0.084
0.3	0.239
0.5	0.418
0.8	0.677
1	0.825

(p. 95 of data
pkg)

AECOM Calculated Offset	-0.0001	OK	Reported Offset	-0.0001
AECOM Slope	0.8322	OK	Reported Slope	0.8322
AECOM Calculated r	0.99979	OK	Reported r	0.99979

LCS calculation

GP1669-B1 P.44,95

Background Absorbance 0
 Total absorbance 0.779
 Total absorbance - background 0.779
 Instrument Concentration 0.936
 Sample weight (mg/kg) 0.0025
 Final Volume (L) 0.1
 Dilution Factor 1

AECOM Calculated LCS Result (mg/Kg)	37.4	OK	Reported Result (mg/Kg)	37.4
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%R = Found/True*100

GP1669-B1 P.44,95

True Value (mg/kg) 40

AECOM Calculated %R	93.6	OK, rounding	Reported %R	93.5
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MS calculation

GP1669-S1 P.46,95 JC31880-5R

Background reading 0.002
 Total absorbance 0.312
 Total absorbance - background 0.31
 Instrument Concentration 0.3726
 Sample weight (mg/kg) 0.00257
 Final Volume (L) 0.1
 Percent solids 0.853
 Dilution Factor 5

AECOM Calculated MS Result (mg/Kg)	85.0	OK	Reported Result (mg/Kg)	85.0
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%R = Found/True*100

GP1669-S1 P.46,95 JC31880-5R

True Value (mg/kg) 45.6
 Native concentration (mg/Kg) 31.5

AECOM %R	117.3	OK	Reported %R	117.3
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Percent Solids

JC31880-5R P.52 NFS-PDI-BB12B-14.0-14.5

Empty dish weight= 20.62
 Wet weight= 28.57
 Dry weight= 27.4

AECOM %solids =	85.3	OK	reported %solids=	85.3
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Reporting Limit	JC31880-5R	P.13,95	NFS-PDI-BB12B-14.0-14.5
Low Standard	0.01		
Initial weight (mg/kg)	0.0025		
Final volume (L)	0.1		
Percent solids	0.853		
Dilution Factor	1		
Reporting Limit	0.47	OK	Reported RL (mg/Kg)= 0.47

Sample Calculations	JC31880-5R	P.13,95	NFS-PDI-BB12B-14.0-14.5
Background reading	0.005		
Total absorbance	0.557		
Total absorbance - background	0.552		
Instrument Response	0.663		
Sample weight (mg/kg)	0.00247		
Final Volume (L)	0.1		
Percent solids	0.853		
Dilution Factor	1		
AECOM Calculated Result (mg/Kg)	31.5	OK	Reported Result (mg/Kg) 31.5

Sample Calculations	JC31880-7R	P.15,95	NFS-PDI-BB12B-18.0-18.5
Background reading	0.005		
Total absorbance	0.404		
Total absorbance - background	0.399		
Instrument Response	0.480		
Sample weight (mg/kg)	0.00254		
Final Volume (L)	0.1		
Percent solids	0.894		
Dilution Factor	1		
AECOM Calculated Result (mg/Kg)	21.1	OK	Reported Result (mg/Kg) 21.1

Data Validation Report

Project:	North Forrest Street Supplemental PDI Sampling	
Laboratory:	SGS/Accutest, Dayton, NJ	
Laboratory Job No.:	JC37033 and JC37033R	
Analysis/Method:	Hexavalent Chromium SW846 3060A/7196A/7199	
Validation Level:	Full	
Site Location/Address:	70 Carteret Avenue, Jersey City, NJ	
AECOM Project No:	60314351.GA.DE.PDI.NFS	
Prepared by:	Charlene Livingston Flint /AECOM	Completed on: 03/08/2017
Reviewed by:	Sharon McKechnie /AECOM	File Name: JC37033_R_2017-03-08_DVRReport-F
Revised by:	Sharon McKechnie /AECOM	Completed on: 07/12/2017
Reviewed by:	Mary Kozik/AECOM	File Name: JC37033_R_2017-07-12_DVR rev01-F

Introduction

The validation report was revised on 7/12/2017 to correct matrix spike sample associations.

The data were reviewed in accordance with the FSP-QAPP and the following NJDEP validation Standard Operating Procedure (SOP):

- NJDEP Office of Data Quality SOP 5.A.10, Rev 3 (September 2009), SOP for Analytical Data Validation of Hexavalent Chromium - for USEPA SW-846 Method 3060A, USEPA SW-846 Method 7196A and USEPA SW-846 Method 7199.

The results of quality control data analyzed with site samples were used to assess the overall reliability of the data. The following qualifiers were used to identify data quality issues:

- U: Indicates the analyte was not detected in the sample above the sample reporting limit.
- J: Indicates the result was an estimated value; the associated numerical value was an approximate concentration of the analyte in the sample.
- UJ: Indicates the analyte was not detected above the reporting limit and the reporting limit was approximate.
- UB: The analyte concentration is less than or equal to three (3) times the concentration in the associated method/prep blank. The presence of the analyte in the sample is negated (UB) due to laboratory contamination.
- JB: The analyte concentration is greater than three (3) times, but less than or equal to ten (10) times the concentration in the associated method/prep blank. The presence of that analyte in the sample is considered "real". The concentration is quantitatively qualified (JB) due to method blank contamination.

R: The sample result was rejected due to serious deficiencies; the presence or absence of the analyte could not be confirmed.

RA: The sample result was rejected but is still considered usable.

Sample Information

The samples listed below were collected by AECOM on February 10, 2017 as part of the North Forrest Street Supplemental PDI Sampling at 70 Carteret Avenue, Jersey City, New Jersey. Only the samples and parameters listed below were validated.

Field ID	Laboratory ID	Matrix	Fraction
NFS-FB20170210 (Equipment Blank)	JC37033-1	Aqueous	Hexavalent Chromium
NFS-PDI-EE17B-0.5-1.0	JC37033-2, -2R	Soil	Hexavalent Chromium
NFS-PDI-EE17B-10.0-10.5	JC37033-3, -3R	Soil	Hexavalent Chromium
NFS-PDI-EE17B-12.0-12.5	JC37033-4, -4R	Soil	Hexavalent Chromium
NFS-PDI-EE17B-14.0-14.5	JC37033-5, -5R	Soil	Hexavalent Chromium
NFS-PDI-EE17B-16.0-16.5	JC37033-6, -6R	Soil	Hexavalent Chromium
NFS-PDI-EE17B-18.0-18.5	JC37033-7, -7R	Soil	Hexavalent Chromium
NFS-PDI-EE17B-2.0-2.5	JC37033-8, -8R	Soil	Hexavalent Chromium
NFS-PDI-EE17B-20.0-20.5	JC37033-9, -9R	Soil	Hexavalent Chromium
NFS-PDI-EE17B-4.0-4.5	JC37033-10, -10R	Soil	Hexavalent Chromium
NFS-PDI-EE17B-4.0-4.5X (Field Duplicate of NFS-PDI-EE17B-4.0-4.5)	JC37033-11, -11R	Soil	Hexavalent Chromium
NFS-PDI-EE17B-6.0-6.5	JC37033-12, -12R	Soil	Hexavalent Chromium
NFS-PDI-EE17B-6.5-7.0	JC37033-13, -13R	Soil	Hexavalent Chromium
NFS-PDI-EE17B-8.0-8.5	JC37033-14, -14R	Soil	Hexavalent Chromium
NFS-PDI-Z12B-10.0-10.5	JC37033-15, -15R	Soil	Hexavalent Chromium
NFS-PDI-Z12B-12.0-12.5	JC37033-16, -16R	Soil	Hexavalent Chromium
NFS-PDI-Z12B-14.0-14.5	JC37033-17, -17R	Soil	Hexavalent Chromium
NFS-PDI-Z12B-16.0-16.5	JC37033-18, -18R	Soil	Hexavalent Chromium
NFS-PDI-Z12B-18.0-18.5	JC37033-19, -19R	Soil	Hexavalent Chromium
NFS-PDI-Z12B-2.0-2.5	JC37033-20, -20R	Soil	Hexavalent Chromium
NFS-PDI-Z12B-20.0-20.5	JC37033-21, -21R	Soil	Hexavalent Chromium
NFS-PDI-Z12B-4.0-4.5	JC37033-22, -22R	Soil	Hexavalent Chromium
NFS-PDI-Z12B-6.0-6.5	JC37033-23, -23R	Soil	Hexavalent Chromium
NFS-PDI-Z12B-8.0-8.5	JC37033-24, -24R	Soil	Hexavalent Chromium
NFS-PDI-Z12B-8.5-9.0	JC37033-25, -25R	Soil	Hexavalent Chromium
NFS-PDI-Z12B-9.0-9.5	JC37033-26, -26R	Soil	Hexavalent Chromium

The samples were collected following the procedures detailed in the Work Order for Garfield Avenue Remedial Action (GARA) at 70 Carteret Avenue, Jersey City, NJ and the Field Sampling Plan/Quality Assurance Project Plan for Non-Residential and Residential Chromium Sites Hudson County, New Jersey (December 2011).

General Comments

The data package was complete. Quality control (QC) issues identified during validation are discussed below. Refer to the Target Analyte Summary Hit List(s) in Attachment A for a listing of all detected results, qualified results, and associated qualifications, where applicable. The nonconformances for each section discussed below are presented in Attachment B.

MS Results

Two matrix spike (MS) samples, NFS-PDI-EE17B-10.0-10.5 (JC37033-3) and NFS-PDI-Z12B-8.5-9.0 (JC37033-25), were analyzed with the samples in this SDG and were used for supporting data quality recommendations. MS samples are associated with field samples using matrix similarities as the primary criteria, then by analytical preparation batch when no matrix match is possible. The following table summarizes each of the MS samples and field samples associated with each, differentiating between those associated by matrix, and those associated by batch.

Spiked Sample	Samples Associated by Matrix	Samples Associated by Batch
NFS-PDI-EE17B-10.0-10.5 (JC37033-3)	NFS-PDI-EE17B-10.0-10.5 (JC37033-3) NFS-PDI-EE17B-6.5-7.0 (JC37033-13) NFS-PDI-EE17B-8.0-8.5 (JC37033-14) NFS-PDI-Z12B-10.0-10.5 (JC37033-15) NFS-PDI-Z12B-9.0-9.5 (JC37033-26)	NFS-PDI-EE17B-12.0-12.5 (JC37033-4) NFS-PDI-EE17B-14.0-14.5 (JC37033-5) NFS-PDI-EE17B-16.0-16.5 (JC37033-6) NFS-PDI-EE17B-18.0-18.5 (JC37033-7) NFS-PDI-EE17B-20.0-20.5 (JC37033-9)
NFS-PDI-Z12B-8.5-9.0 (JC37033-25)	NFS-PDI-EE17B-0.5-1.0 (JC37033-2) NFS-PDI-EE17B-2.0-2.5 (JC37033-8) NFS-PDI-EE17B-4.0-4.5 (JC37033-10) NFS-PDI-EE17B-4.0-4.5X (JC37033-11) NFS-PDI-EE17B-6.0-6.5 (JC37033-12) NFS-PDI-Z12B-6.0-6.5 (JC37033-23) NFS-PDI-Z12B-8.5-9.0 (JC37033-25) NFS-PDI-Z12B-8.0-8.5 (JC37033-24)	NFS-PDI-Z12B-16.0-16.5 (JC37033-18) NFS-PDI-Z12B-18.0-18.5 (JC37033-19) NFS-PDI-Z12B-2.0-2.5 (JC37033-20) NFS-PDI-Z12B-20.0-20.5 (JC37033-21) NFS-PDI-Z12B-4.0-4.5 (JC37033-22) NFS-PDI-Z12B-12.0-12.5 (JC37033-16) NFS-PDI-Z12B-14.0-14.5 (JC37033-17)

MS sample NFS-PDI-EE17B-10.0-10.5 (JC37033-3)

Sample NFS-PDI-EE17B-10.0-10.5, associated with samples as noted above, was selected for the soil MS analysis and used for supporting data quality recommendations. The soluble and insoluble MS recoveries were 63.3% and 89.2%, respectively. The soluble MS did not meet the quality control criteria (QC) of 75-125%. The post digestion spike (PDS) recovery was 97%, which met the PDS criteria of 85-115%.

Based on the soluble MS recovery, less than 75%R, the MS and associated samples were reanalyzed using Method 7196. The soluble and insoluble MS recoveries from the re-analysis were 24.1% and 98.9%, respectively; the soluble MS again did not meet the QC criteria of 75-125%R. The PDS result for the re-analysis batch was recovered at 99%, which met the PDS criteria of 85-115%.

Since the matrix spikes failed to meet QC criteria, additional parameters were analyzed to determine if possible matrix interferences could be the cause for the poor matrix spike recoveries. All the samples were tested for pH and oxidation reduction potential (ORP), and plotted on an Eh/pH phase diagram. From this chart, the source sample for the matrix spike analysis of sample NFS-PDI-EE17B-10.0-10.5 was plotted below the phase change line, indicating reducing potential within the sample matrix, incapable of supporting hexavalent chromium. Ferrous iron, sulfide screen, and total organic carbon (TOC) were performed on this matrix spike source sample to confirm the oxidizing/reducing potential within the sample matrix. The sulfide screen was reported as nondetect,

indicating no reducing agents within the sample matrix; however, the ferrous iron (1.3%) and the TOC results (1940 mg/Kg) were positive, indicating potential reducing agents within the sample matrix.

Since the MS recoveries did not meet the QC requirements, but at least one MS recovery was greater than 50%, the reported hexavalent chromium results in all the associated soil samples in this SDG were qualified as estimated (J/UJ) due to the poor MS recoveries. The highest detected hexavalent chromium result or the nondetect hexavalent chromium result with the lowest reporting limit (RL) between the initial and reanalysis was reported for each soil sample.

MS sample NFS-PDI-Z12B-8.5-9.0 (JC37033-25)

Sample NFS-PDI-Z12B-8.5-9.0, associated with samples as noted above, was selected for the soil matrix spike analysis and used for supporting data quality recommendations. The soluble and insoluble MS recoveries from the initial batch were 0.0% and 0.1%, respectively. Both MS recoveries did not meet QC criteria of 75-125%R, and were less than 50%. The PDS recovery was 64% and after pH adjustment was 78%, which did not meet the PDS criteria of 85-115%.

Based on the very low MS and PDS recoveries - often an indication that Method 7199 may be more successful in producing improved matrix spike recovery, samples were reanalyzed using Method 7199.

Method 7199

Sample NFS-PDI-Z12B-8.5-9.0 was again selected for the MS re-analysis associated with the samples in this SDG. The soluble and insoluble MS results from the reanalysis by method 7199 were 0.3% and 8.0%, respectively, which did not meet QC criteria of 75-125% and were less than 50%. The PDS result was 100%, which was within the QC criteria of 85-115%.

Since the matrix spikes failed to meet QC criteria, additional parameters were analyzed to determine if possible matrix interferences could be the cause for the poor matrix spike recoveries. All the samples were tested for pH and oxidation reduction potential (ORP), and plotted on an Eh/pH phase diagram. From this chart, the source sample for the matrix spike analysis of sample NFS-PDI-Z12B-8.5-9.0 was plotted below the phase change line, indicating reducing potential within the sample matrix, incapable of supporting hexavalent chromium. Ferrous iron, sulfide screen, and total organic carbon (TOC) were performed on this matrix spike source sample to confirm the oxidizing/reducing potential within the sample matrix. The sulfide screen was reported as nondetect, indicating no reducing agents within the sample matrix; however, the ferrous iron (1.9 %) and the TOC results (55,500 mg/Kg) were positive, indicating potential reducing agents within the sample matrix.

Since both soluble and insoluble MS recoveries were less than 50% in the initial analysis by method 7196 and reanalysis by method 7199, all the associated soil hexavalent chromium results were rejected (RA). The highest detected hexavalent chromium result or the nondetect hexavalent chromium result with the lowest RL between the initial and reanalysis was reported for each sample.

No further qualifications were taken based on the low initial analysis PDS recovery as the reanalysis PDS %R met QC limits.

Sample Results

Reported results (flagged B by the laboratory) that were less than the reporting limit (RL), but greater than or equal to the method detection limit (MDL) are approximate values and have been qualified as estimated (J).

7199 Replicate Analysis

The reported hexavalent chromium result in sample NFS-PDI-Z12B-8.5-9.0 (JC37033-25R) was estimated (J) due to poor sample 7199 replicate precision.

Data Quality and Usability

The results for hexavalent chromium in the soil samples associated with the matrix spike, NFS-PDI-Z12B-8.5-9.0 (JC37033-25) were rejected; however, the results may be usable for project objectives as discussed below. In general, the remaining data appear to be valid and may be used for decision-making purposes. Qualified, detected, and rejected results are presented in Attachments A and B.

Based on the initial and reanalysis MS soluble and insoluble recoveries, the hexavalent chromium result in samples associated with MS sample NFS-PDI-Z12B-8.5-9.0 (JC37033-25) were rejected. However, based on the reducing potential of the sample matrix shown by the Eh/pH phase diagram and the additional ancillary parameters, there is evidence to suggest that the matrix for this sample was reducing and not capable of supporting hexavalent chromium. Therefore, even though the sample results were rejected based on MS %Rs, these results may be usable for site decisions as estimated values. The highest detected hexavalent chromium result or the nondetect hexavalent chromium result with the lowest RL between the initial analysis and reanalysis was reported for each sample.

All remaining reported hexavalent chromium soil results associated with the matrix spike NFS-PDI-EE17B-10.0-10.5 (JC37033-3) are usable as estimated values with the potential for low bias due to low soluble MS recovery, and since the MS sample matrix appears to be reducing based on the Eh-pH plot and the presence of TOC and ferrous iron.

Sample results qualified due to poor 7199 sample replicate precision are usable as estimated values with an unknown directional bias.

Sample results reported between the MDL and RL are usable as estimated values with an unknown directional bias.

ATTACHMENTS

Attachment A: Target Analyte Summary Hit List(s)

Attachment B: Data Validation Report Form

Attachment A

Target Analyte Summary Hit List(s)

Soil Target Analyte Summary Hit List (Hexavalent Chromium)

Site Name North Forrest Street Supplemental PDI Sampling
Sampling Date February 10, 2017
Lab Name/ID SGS/Accutest, Dayton, NJ
SDG No JC37033 and JC37033R
Sample Matrix Soil
Trip Blank ID NA
Field Blank ID NFS-FB20170210

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
NFS-PDI-EE17B-0.5-1.0	JC37033-2R	CHROMIUM (HEXAVALENT)	U	4.5	RA	0.45	Reject	2
NFS-PDI-EE17B-10.0-10.5	JC37033-3	CHROMIUM (HEXAVALENT)	U	U	UJ	0.51	Qualify	1
NFS-PDI-EE17B-12.0-12.5	JC37033-4R	CHROMIUM (HEXAVALENT)	U	1.2	1.2	0.48	Qualify	1
NFS-PDI-EE17B-14.0-14.5	JC37033-5	CHROMIUM (HEXAVALENT)	U	0.83	0.83	0.47	Qualify	1
NFS-PDI-EE17B-16.0-16.5	JC37033-6	CHROMIUM (HEXAVALENT)	U	U	UJ	0.47	Qualify	1
NFS-PDI-EE17B-18.0-18.5	JC37033-7	CHROMIUM (HEXAVALENT)	U	U	UJ	0.46	Qualify	1
NFS-PDI-EE17B-2.0-2.5	JC37033-8R	CHROMIUM (HEXAVALENT)	U	5.1	RA	0.48	Reject	2
NFS-PDI-EE17B-20.0-20.5	JC37033-9	CHROMIUM (HEXAVALENT)	U	0.57	0.57	0.47	Qualify	1
NFS-PDI-EE17B-4.0-4.5	JC37033-10	CHROMIUM (HEXAVALENT)	U	U	RA	0.49	Reject	2
NFS-PDI-EE17B-4.0-4.5X	JC37033-11	CHROMIUM (HEXAVALENT)	U	0.98	RA	0.49	Reject	2
NFS-PDI-EE17B-6.0-6.5	JC37033-12	CHROMIUM (HEXAVALENT)	U	U	RA	0.55	Reject	2
NFS-PDI-EE17B-6.5-7.0	JC37033-13R	CHROMIUM (HEXAVALENT)	U	1.1	1.1	0.63	Qualify	1
NFS-PDI-EE17B-8.0-8.5	JC37033-14	CHROMIUM (HEXAVALENT)	U	U	UJ	0.53	Qualify	1
NFS-PDI-Z12B-18.0-18.5	JC37033-19	CHROMIUM (HEXAVALENT)	U	0.50	RA	0.47	Reject	2
NFS-PDI-Z12B-2.0-2.5	JC37033-20	CHROMIUM (HEXAVALENT)	U	4.4	RA	0.49	Reject	2
NFS-PDI-Z12B-4.0-4.5	JC37033-22	CHROMIUM (HEXAVALENT)	U	5.0	RA	0.46	Reject	2
NFS-PDI-Z12B-8.0-8.5	JC37033-24	CHROMIUM (HEXAVALENT)	U	1.1	RA	0.49	Reject	2,

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
NFS-PDI-Z12B-8.5-9.0	JC37033-25	CHROMIUM (HEXAVALENT)	U	U	RA	0.53	Reject	2,4
NFS-PDI-Z12B-9.0-9.5	JC37033-26	CHROMIUM (HEXAVALENT)	U	0.40B	0.40	0.55	Qualify	1,3
NFS-PDI-Z12B-10.0-10.5	JC37033-15R	CHROMIUM (HEXAVALENT)	U	0.17B	0.17	0.55	Qualify	1,3
NFS-PDI-Z12B-12.0-12.5	JC37033-16R	CHROMIUM (HEXAVALENT)	U	U	RA	0.47	Reject	2
NFS-PDI-Z12B-14.0-14.5	JC37033-17R	CHROMIUM (HEXAVALENT)	U	0.72	RA	0.46	Reject	2
NFS-PDI-Z12B-16.0-16.5	JC37033-18R	CHROMIUM (HEXAVALENT)	U	0.17B	RA	0.51	Reject	2,3
NFS-PDI-Z12B-20.0-20.5	JC37033-21R	CHROMIUM (HEXAVALENT)	U	1.1	RA	0.46	Reject	2
NFS-PDI-Z12B-6.0-6.5	JC37033-23R	CHROMIUM (HEXAVALENT)	U	2.0	RA	0.50	Reject	2

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

NJDEP Laboratory Footnote

1. The result was estimated because the MS recoveries were less than 75%, but at least one recovery was above 50%.
2. The sample result was rejected because the soluble and insoluble matrix spike recoveries were less than 50%.
3. The reported result was greater than the MDL but less than the RL and qualified as estimated.
4. The reported value was qualified because the sample replicate precision criterion of < 20% for method 7199 was exceeded.

Attachment B

Data Validation Report Form

Client Name: PPG Industries	Project Number: 60314351.GA.DE.PDI.NFS
Site Location: North Forrest Street Supplemental PDI Sampling, Jersey City, NJ	Project Manager: Scott Mikaelian
Laboratory: SGS/Accutest, Dayton, NJ	Type of Validation: Full
Laboratory Job No: JC37033 and JC37033R	Date Checked: 03/08/2017
Validator: Charlene Livingston Flint	Peer: Sharon McKechnie

ITEM	YES	NO	N/A	COMMENTS
Sample results included?	X			
Reporting Limits met project requirements?	X			
Field I.D. included?	X			
Laboratory I.D. included?	X			
Did electronic data deliverable (EDD) sample IDs match COC sample IDs?	X			
Did data package sample IDs match electronic data deliverable (EDD) sample IDs?	X			
Sample matrix included?	X			
Sample matrix included?	X			
Sample receipt temperature 2-6°C?	X			2.4 °C
Signed COCs included?	X			
Date of sample collection included?	X			
Date of sample digestion included?	X			
Holding time to digestion met criteria? (Soils -30 days from collection to digestion.)	X			
Date of analysis included?	X			
Holding time to analysis met criteria? (Soils -168 hours from digestion to analysis; Aqueous - 24 hours from collection to analysis.)	X			
Method reference included?	X			
Laboratory Case Narrative included?	X			

Definitions: MDL - Method Detection Limit; %R - Percent Recovery; RL - Reporting Limit; RPD - Relative Percent Difference; RSD - Relative Standard Deviation ;Corr - Correlation Coefficient.

ITEM	YES	NO	N/A	COMMENTS
Initial calibration documentation included in lab package?	X			
1) Blank plus 4 standards (7196A) or blank plus 3 standards (7199)	X			
2) Correlation coefficient of =0.995 (7196A) or =0.999 (7199)	X			
3) Calibrate daily or each time instrument is set up.	X			
Calibration Check Standard (CCS) for 7196A and Quality Control Sample (QCS) for 7199 Included in Lab Package?	X			
1) %R criteria met? (90 - 110%)	X			
2) Correct frequency of one per every 10 samples	X			
3) CCS and QCS from independent source and at mid- level of calibration curve	X			
Calibration Blanks	X			
1) Analyzed prior to initial calibration standards and after each CCS/QCS?	X			
2) Absolute value should not exceed MDL.	X			
Method Blank, Field Blanks and/or Equipment Blanks Included in Lab Package?	X			
1) Method blank analyzed with each preparation batch?	X			
2) Absolute value should not exceed MDL.	X			
Eh and pH Data	X			
1) Eh and pH data was included and plotted for all samples?	X			
Soluble Matrix Spike Data Included in Lab Package?	X			JC37033-3, -3R & JC37033-25, 25R
1) Soluble Matrix %R criteria met? (75-125%R).		X		See table.
2) Was the spike concentration 40 mg/Kg or twice the sample concentration?		X		Spiked at 50.2, 51.8, 51.7 and 55.2 mg/kg. No impact on data.
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	X			
Insoluble Matrix Spike Data Included in Lab Package?	X			
1) Insoluble Matrix %R criteria met? (75-125%R).		X		
2) Was the spike concentration around 400 to 800 mg/Kg?		X		Spiked at 989, 1080, 1070 and 970 mg/kg. No impact on data.
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	X			
Post Digestion Spike	X			

ITEM	YES	NO	N/A	COMMENTS
1) Post Digestion Spike %R criteria met? (85-115%R).	X			
2) Was the spike concentration 40 mg/Kg or twice the sample concentration?	X			
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	X			
Sample Duplicate Data Included in Lab Package?	X			2 Sets. JC37033-3, -3R and JC37033-25, -25R
1) RPD criteria met? (RPD <20%) if both results are >4x RL or absolute difference <RL if either or both results are <4xRL.	X			<4xRL, Abs Diff< RL, See table
2) Was a sample duplicate analyzed at the frequency of 1 per batch or 20 samples?	X			
Was a Laboratory Control Sample (LCS) Included in Lab Package?	X			
1) %R criteria met? (80-120%R).	X			
2) Was an LCS analyzed at the frequency of 1/batch or 20 samples?	X			
Were any Field Duplicate samples submitted with this SDG?	X			JC37033-10 & JC37033-11
1) RPD criteria met? (RPD <20%) if both results are >4x RL or absolute difference <RL if either or both results are <4xRL	X			See table.
Were all sample quantitation and reporting requirements met?	X			
1) Were all solid samples reported with percent solids > 50%?	X			
2) Were any samples analyzed or reported with dilutions?		X		
Miscellaneous Items	X			
1) For soils by 7196A, was the pH within a range of 7.0-8.0?	X			
2) For soils by 7199, was the pH within a range of 9.0-9.5?	X			
3) For aqueous by 7196A, was the pH with a range of 1.5-2.5?	X			
4) For soils (3060A), was the digestion temperature 90-95C for at least 60 minutes?	X			
5) For 7199, was each sample injected twice and was the RPD ≤20?		X		See table.

Matrix Spikes

Sample ID	Lab ID	Analyte	Matrix Spike	% Recovery	Lower Limit	Upper Limit	PDS %	PDS Limit	Action
NFS-PDI-EE17B-10.0-10.5	JC37033-3	CHROMIUM (HEXAVALENT)	Insoluble	89.2	75	125	97	85-115	Estimate (J/UJ)
NFS-PDI-EE17B-10.0-10.5	JC37033-3	CHROMIUM (HEXAVALENT)	Soluble	63.3					
NFS-PDI-EE17B-10.0-10.5	JC37033-3R	CHROMIUM (HEXAVALENT)	Insoluble	98.9			99		
NFS-PDI-EE17B-10.0-10.5	JC37033-3R	CHROMIUM (HEXAVALENT)	Soluble	24.1					
NFS-PDI-Z12B-8.5-9.0	JC37033-25R	CHROMIUM (HEXAVALENT)	Soluble	0.3			100		
NFS-PDI-Z12B-8.5-9.0	JC37033-25R	CHROMIUM (HEXAVALENT)	Insoluble	8.0					
NFS-PDI-Z12B-8.5-9.0	JC37033-25	CHROMIUM (HEXAVALENT)	Soluble	0.0			64, pH adjusted 78		
NFS-PDI-Z12B-8.5-9.0	JC37033-25	CHROMIUM (HEXAVALENT)	Insoluble	0.1					Reject (RA)

Lab Duplicates

Sample ID	Lab ID	Analyte	Sample Result	Qual	Duplicate Result	Qual	QL	Units	RPD	Action
NFS-PDI-EE17B-10.0-10.5	JC37033-3	CHROMIUM (HEXAVALENT)	0.36	U	0.79		0.51	mg/kg	NC	SR<4xRL, Abs Diff<RL, Accept
NFS-PDI-EE17B-10.0-10.5	JC37033-3R	CHROMIUM (HEXAVALENT)	0.36	U	0.71		0.51	mg/kg	NC	SR<4xRL, Abs Diff<RL, Accept
NFS-PDI-Z12B-8.5-9.0	JC37033-25	CHROMIUM (HEXAVALENT)	0.37	U	0.37	U	0.53	mg/kg	0	Both SR ND, Accept
NFS-PDI-Z12B-8.5-9.0	JC37033-25R	CHROMIUM (HEXAVALENT)	0.15	U	0	U	0.51	mg/kg	0	Both SR ND, Accept

NC- Not calculated

Field Duplicates

Sample ID	Duplicate ID	Analyte	Sample Result	Duplicate Result	QL	Units	RPD	Action
NFS-PDI-EE17B-4.0-4.5	NFS-PDI-EE17B-4.0-4.5X	CHROMIUM (HEXAVALENT)	0.49 U	0.98	0.49	mg/kg	NC	RPD Not Calculable (NC). Detected Result <4X RL; Accept

Percent Solids

Sample ID	Percent Solids (%)	Status
NFS-PDI-EE17B-0.5-1.0	88.7	ok @50%
NFS-PDI-EE17B-10.0-10.5	78.1	ok @50%
NFS-PDI-EE17B-12.0-12.5	82.5	ok @50%
NFS-PDI-EE17B-14.0-14.5	85.2	ok @50%
NFS-PDI-EE17B-16.0-16.5	85.3	ok @50%
NFS-PDI-EE17B-18.0-18.5	86.3	ok @50%
NFS-PDI-EE17B-2.0-2.5	84	ok @50%
NFS-PDI-EE17B-20.0-20.5	85.2	ok @50%
NFS-PDI-EE17B-4.0-4.5	81.5	ok @50%
NFS-PDI-EE17B-4.0-4.5X	81.9	ok @50%
NFS-PDI-EE17B-6.0-6.5	73.2	ok @50%
NFS-PDI-EE17B-6.5-7.0	63.6	ok @50%
NFS-PDI-EE17B-8.0-8.5	75.9	ok @50%
NFS-PDI-Z12B-10.0-10.5	71.2	ok @50%
NFS-PDI-Z12B-12.0-12.5	82	ok @50%
NFS-PDI-Z12B-14.0-14.5	83.9	ok @50%
NFS-PDI-Z12B-16.0-16.5	78.1	ok @50%
NFS-PDI-Z12B-18.0-18.5	85.5	ok @50%

Sample ID	Percent Solids (%)	Status
NFS-PDI-Z12B-2.0-2.5	81.1	ok @50%
NFS-PDI-Z12B-20.0-20.5	86.5	ok @50%
NFS-PDI-Z12B-4.0-4.5	86.9	ok @50%
NFS-PDI-Z12B-6.0-6.5	83.1	ok @50%
NFS-PDI-Z12B-8.0-8.5	82	ok @50%
NFS-PDI-Z12B-8.5-9.0	75.2	ok @50%
NFS-PDI-Z12B-9.0-9.5	72.3	ok @50%
NFS-PDI-Z12B-8.0-8.5	82	ok @50%
NFS-PDI-Z12B-8.5-9.0	75.2	ok @50%
NFS-PDI-Z12B-9.0-9.5	72.3	ok @50%

7199 Replicate RPDs

Sample ID	Rep 1 (ppm)	Rep 2 (ppm)	RPD%	RPD Criteria ≤20
JC37033-14R	0.015	0.014	6.9%	OK
JC37033-15R	0.027	0.033	20.0%	OK
JC37033-16R	0.024	0.022	8.7%	OK
JC37033-17R	0.146	0.151	3.4%	OK
JC37033-18R	0.035	0.035	0.0%	OK
JC37033-19R	0.067	0.058	14.4%	OK
JC37033-20R	0.118	0.119	0.8%	OK
JC37033-21R	0.229	0.231	0.9%	OK
JC37033-22R	0.481	0.489	1.6%	OK
JC37033-23R	0.371	0.377	1.6%	OK
JC37033-24R	0.043	0.04	7.2%	OK
JC37033-25R	0.009	0.005	57.1%	Estimate (J)
JC37033-26R	0.018	0.017	5.7%	OK

SDG#: JC37033/ Method 7196

Batch: GN59410

Cr+6 ICAL 2/15/17

Soil

(p. 92 of data pkg)

x - concentration	y - response
0	0
0.01	0.01
0.05	0.044
0.1	0.087
0.3	0.247
0.5	0.41
0.8	0.666
1	0.821

(p. 92 of data pkg)

AECOM Calculated Offset	0.0019	OK	Reported Offset	0.0019
AECOM Slope	0.8224	OK	Reported Slope	0.8224
AECOM Calculated r	0.99995	OK	Reported r	0.99995

LCS calculation

GP3237-B1

P. 65,92

Background Absorbance	0
Total absorbance	0.759
Total absorbance - background	0.759
Instrument Concentration	0.921
Sample weight (mg/kg)	0.0025
Final Volume (L)	0.1
Dilution Factor	1

AECOM Calculated LCS Result (mg/Kg)	36.8	OK	Reported Result (mg/Kg)	36.8
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%R = Found/True*100

GP3237-B1

P. 65,92

True Value (mg/kg)	40
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AECOM Calculated %R	92.1	OK, rounding	Reported %R	92.0
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MS calculation

GP3237-S2

P. 67,68,92

JC37033-3

Background reading	0
Total absorbance	0.285
Total absorbance - background	0.285
Instrument Concentration	0.3442
Sample weight (mg/kg)	0.0025
Final Volume (L)	0.1
Percent solids	0.781
Dilution Factor	50

AECOM Calculated MS Result (mg/Kg)	882	OK	Reported Result (mg/Kg)	882
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%R = Found/True*100

GP3237-S2

P. 67,68,92

JC37033-3

True Value (mg/kg)	989
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Native concentration (mg/Kg)	0
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AECOM%R	89.1	OK, rounding	Reported %R	89.2
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Percent Solids	JC37033-3	P. 68	NFS-PDI-EE17B-10.0-10.5
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Empty dish weight=	20.29
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Wet weight=	28.28
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Dry weight=	26.53
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AECOM %solids =	78.1	OK	Reported %solids=	78.1
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Reporting Limit	JC37033-3	P. 16,68,92	NFS-PDI-EE17B-10.0-10.5
------------------------	------------------	--------------------	--------------------------------

Low Standard	0.01
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Initial weight (mg/kg)	0.0026
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Final volume (L)	0.1
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Percent solids	0.781
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Dilution Factor	1
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Reporting Limit	0.49	OK, rounding	Reported RL (mg/Kg)=	0.51
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<u>Sample Calculations</u>	JC37033-3	P. 16,68,92	NFS-PDI-EE17B-10.0-10.5
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Background reading	0.015
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Total absorbance	0.02
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Total absorbance - background	0.005
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Instrument Response	0.004
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Sample weight (mg/kg)	0.0026
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Final Volume (L)	0.1
------------------	-----

Percent solids	0.781
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Dilution Factor	1
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AECOM Calculated Result (mg/Kg)	0.2	OK, Reported as Nondetect	Reported Result (mg/Kg)	0.36 U
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Samples associated with JC37033-2 through JC37033-13

SDG#: JC37033/ Method 7196

Batch: GN59424

Cr+6 ICAL 2/15/17

Soil

(p. 100 of data pkg)

X - concentration	y - response
0	0
0.01	0.01
0.05	0.044
0.1	0.087
0.3	0.247
0.5	0.41
0.8	0.666
1	0.821

(p. 100 of data pkg)

AECOM Calculated Offset	0.0019	OK	Reported Offset	0.0019
AECOM Slope	0.8224	OK	Reported Slope	0.8224
AECOM Calculated r	0.99995	OK	Reported r	0.99995

LCS calculation

GP3238-B1 P. 65,100

Background Absorbance	0
Total absorbance	0.755
Total absorbance - background	0.755
Instrument Concentration	0.916
Sample weight (mg/kg)	0.0025
Final Volume (L)	0.1
Dilution Factor	1

AECOM Calculated LCS Result (mg/Kg)	36.6	OK	Reported Result (mg/Kg)	36.6
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%R = Found/True*100

GP3238-B1 P. 65,100

True Value (mg/kg)	40
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AECOM Calculated %R	91.6	OK, rounding	Reported %R	91.5
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MS calculation

GP3238-S2 P. 67,71,100 JC37033-25

Background reading	0.009
Total absorbance	0.02
Total absorbance - background	0.011
Instrument Concentration	0.0110
Sample weight (mg/kg)	0.00255
Final Volume (L)	0.1
Percent solids	0.752
Dilution Factor	1

AECOM Calculated MS Result (mg/Kg)	0.58	OK	Reported Result (mg/Kg)	0.58
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%R = Found/True*100

GP3238-S2 P. 67,71,100 JC37033-25

True Value (mg/kg)	1070
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Native concentration (mg/Kg)	0
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AECOM%R	0.1	OK	Reported %R	0.1
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Percent Solids

JC37033-25 P. 71 NFS-PDI-Z12B-8.5-9.0

Empty dish weight=	20.16
Wet weight=	29.54
Dry weight=	27.21

AECOM %solids =	75.2	OK	Reported %solids=	75.2
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Reporting Limit	JC37033-25	P. 38,71,100	NFS-PDI-Z12B-8.5-9.0
Low Standard	0.01		
Initial weight (mg/kg)	0.00254		
Final volume (L)	0.1		
Percent solids	0.752		
Dilution Factor	1		
Reporting Limit	0.52	OK, rounding	Reported RL (mg/Kg)= 0.53

Sample Calculations	JC37033-25	P. 38,71,100	NFS-PDI-Z12B-8.5-9.0
Background reading	0.011		
Total absorbance	0.01		
Total absorbance - background	-0.001		
Instrument Response	-0.004		
Sample weight (mg/kg)	0.00254		
Final Volume (L)	0.1		
Percent solids	0.752		
Dilution Factor	1		
AECOM Calculated Result (mg/Kg)	-0.2	OK, Reported as Nondetect	Reported Result (mg/Kg) 0.37 U

Samples associated with JC37033-14 through JC37033-26

SDG#: JC37033R/ Method 7196

Batch: GN59686

Cr+6 ICAL 2/21/17

Soil

(p. 113 of data pkg)

x - concentration	y - response
0	0
0.01	0.01
0.05	0.045
0.1	0.09
0.3	0.246
0.5	0.415
0.8	0.649
1	0.820

(p. 113 of data pkg)

AECOM Calculated Offset	0.0035	OK	Reported Offset	0.0035
AECOM Slope	0.8141	OK	Reported Slope	0.8141
AECOM Calculated r	0.99992	OK	Reported r	0.99992

LCS calculation

GP3345-B1 P. 60,113

Background Absorbance	0
Total absorbance	0.716
Total absorbance - background	0.716
Instrument Concentration	0.875
Sample weight (mg/kg)	0.0025
Final Volume (L)	0.1
Dilution Factor	1

AECOM Calculated LCS Result (mg/Kg)	35.0	OK	Reported Result (mg/Kg)	35.0
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%R = Found/True*100

GP3345-B1 P. 60,113

True Value (mg/kg)	40
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AECOM Calculated %R	87.5	OK	Reported %R	87.5
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MS calculation

GP3345-S2 P. 62,69,113 JC37033-3R

Background reading	0
Total absorbance	0.329
Total absorbance - background	0.329
Instrument Concentration	0.3998
Sample weight (mg/kg)	0.0024
Final Volume (L)	0.1
Percent solids	0.781
Dilution Factor	50

AECOM Calculated MS Result (mg/Kg)	1067	OK, rounding	Reported Result (mg/Kg)	1070
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%R = Found/True*100

GP3345-S2 P. 62,69,113 JC37033-3R

True Value (mg/kg)	1080
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Native concentration (mg/Kg)	0
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AECOM%R	98.8	OK, rounding	Reported %R	98.9
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Percent Solids	JC37033-3R	P. 69	NFS-PDI-EE17B-10.0-10.5
Empty dish weight=	20.29		
Wet weight=	28.28		
Dry weight=	26.53		
AECOM %solids =	78.1	OK	Reported %solids= 78.1

Reporting Limit	JC37033-3R	P. 13,69,113	NFS-PDI-EE17B-10.0-10.5
Low Standard	0.01		
Initial weight (mg/kg)	0.00248		
Final volume (L)	0.1		
Percent solids	0.781		
Dilution Factor	1		
Reporting Limit	0.52	OK, rounding	Reported RL (mg/Kg)= 0.51

Sample Calculations	JC37033-3R	P. 13,69,113	NFS-PDI-EE17B-10.0-10.5
Background reading	0.01		
Total absorbance	0.014		
Total absorbance - background	0.004		
Instrument Response	0.001		
Sample weight (mg/kg)	0.00248		
Final Volume (L)	0.1		
Percent solids	0.781		
Dilution Factor	1		
AECOM Calculated Result (mg/Kg)	0.0	OK, Reported as Nondetect	Reported Result (mg/Kg) 0.36 U

Samples associated with JC37033-2R through JC37033-13R

SDG: JC37033R/ Method 7199
Batch GN59985
 Cr+6 ICAL 2/27/17
 Soil
 (p. 139-144 of data package)

x - concentration	y - response (area) mAU*min	
0.00	0.009	STDA
0.005	0.0422	STDB
0.05	0.4808	STDC
0.1	0.9574	STDD
0.5	4.7504	STDE

(p. 139-144
of data
package)

AECOM Calculated Offset	0.0042	OK	Reported Offset	0.0042
AECOM Slope	9.4941	OK, rounding	Reported Slope	9.4940
AECOM Calculated r	1.0000	OK	Reported r	1.0000

LCS calculation **GP3515-B1** **P. 63,149**

Highest replicate response (AREA, mAU*min) 2.134
 Instrument Concentration (ug/L) 0.224
 Sample weight 0.0025
 Percent solids 1
 Dilution Factor 4

AECOM Calculated LCS Result (mg/Kg)	35.9	OK	Reported Result (mg/Kg)	35.9
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%R = Found/True*100 **GP3515-B1** **P. 63,149**

True Value (mg/kg) 40

AECOM Calculated %R	89.7	OK, rounding	Reported %R	89.8
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MS calculation **GP3515-S2** **P. 65,78,132,201** **JC37033-25R**

Highest replicate response (mAU*min) 2.665
 Instrument Concentration (ug/L) 0.2803
 Sample weight 0.0024
 Percent solids 0.752
 Dilution Factor 5

AECOM Calculated MS Result (mg/Kg)	77.6	OK	Reported Result (mg/Kg)	77.6
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%R = Found/True*100 **GP3515-S2** **P. 65,78,132,201** **JC37033-25R**

True Value (mg/kg) 970
 Native concentration (mg/Kg) 0

%R	8.0	OK	Reported %R	8.0
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Percent Solids **JC37033-25R** **P. 78** **NFS-PDI-Z12B-8.5-9.0**

Empty dish weight= 20.16
 Wet weight= 29.54
 Dry weight= 27.21

AECOM %solids =	75.2	OK	Reported %solids=	75.2
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Reporting limit **JC37033-25R** **P. 36,78,132,156** **NFS-PDI-Z12B-8.5-9.0**

Low Standard 0.01
 Initial weight (g) 0.00247
 Final volume (L) 0.1
 Percent solids 0.752
 Dilution Factor 1

Reporting Limit	0.54	OK	Reported RL (mg/Kg)=	0.54
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Sample Calculations**JC37033-25R****P. 36,78,132,156****NFS-PDI-Z12B-8.5-9.0**

Background reading from highest response	0.00001
Instrument Response highest response	0.009
Total response for replicate 1	0.00899
Instrument Response (mg/L)	0.001
Sample weight (mg)	0.00247
Final Volume (L)	0.1
Percent solids	0.752
Dilution Factor	1

AECOM Calculated Result (mg/Kg)	0.03	OK, reported as ND	Reported Result (mg/Kg)	0.15 U
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Associated with samples JC37033-14R through JC37033-26R

Data Validation Report

Project:	North Forrest Street Supplemental PDI Sampling	
Laboratory:	SGS/Accutest, Dayton, NJ	
Laboratory Job No.:	JC37081 and JC37081R	
Analysis/Method:	Hexavalent Chromium SW846 3060A/7196A/7199	
Validation Level:	Full (Hexavalent Chromium)	
Site Location/Address:	70 Carteret Avenue, Jersey City, NJ	
AECOM Project No:	60314351.GA.DE.PDI.NFS	
Prepared by:	Sharon McKechnie /AECOM	Completed on: 02/24/2017
Reviewed by:	Kristin Rutherford/ AECOM	File Name: JC37081_R_2017_02_24_DVR-F
Revised by:	Sharon McKechnie /AECOM	Completed on: 07/12/2017
Reviewed by:	Mary Kozik/ AECOM	File Name: JC37081_R_2017_07_12_DVR rev01-F

Introduction

The validation report was revised on 7/12/2017 to correct matrix spike sample associations.

The data were reviewed in accordance with the FSP-QAPP and the following NJDEP and/or Region 2 validation Standard Operating Procedure(s) (SOP):

- NJDEP Office of Data Quality SOP 5.A.10, Rev 3 (September 2009), SOP for Analytical Data Validation of Hexavalent Chromium - for USEPA SW-846 Method 3060A, USEPA SW-846 Method 7196A/7199.

The results of quality control data analyzed with site samples were used to assess the overall reliability of the data. The following qualifiers were used to identify data quality issues:

- U: Indicates the analyte was not detected in the sample above the sample reporting limit.
- J: Indicates the result was an estimated value; the associated numerical value was an approximate concentration of the analyte in the sample.
- UJ: Indicates the analyte was not detected above the reporting limit and the reporting limit was approximate.
- UB: The analyte concentration is less than or equal to three (3) times the concentration in the associated method/prep blank. The presence of the analyte in the sample is negated (UB) due to laboratory contamination.
- JB: The analyte concentration is greater than three (3) times, but less than or equal to ten (10) times the concentration in the associated method/prep blank. The presence of that analyte in the sample is considered "real". The concentration is quantitatively qualified (JB) due to method blank contamination.

- R: The sample result was rejected due to serious deficiencies; the presence or absence of the analyte could not be confirmed.
- RA: The sample result was rejected due to NJ specific data validation QC requirements; however, the result is usable for project objectives. Refer to the Data Quality and Usability section in this data validation report for further discussion.

Sample Information

The samples listed below were collected by AECOM on February 12, 2017 as part of the North Forrest Street Supplemental PDI Sampling at 70 Carteret Avenue, Jersey City, New Jersey. Only the samples and parameters listed below were validated.

Field ID	Laboratory ID	Matrix	Fraction
NFS-FB20170212 (Equipment Blank)	JC37081-1	Aqueous	Hexavalent Chromium
NFS-PDI-X14BR-0.5-1.0	JC37081-2	Soil	Hexavalent Chromium
NFS-PDI-X14BR-10.0-10.5	JC37081-3	Soil	Hexavalent Chromium
NFS-PDI-X14BR-11.5-12.0	JC37081-4	Soil	Hexavalent Chromium
NFS-PDI-X14BR-12.0-12.5	JC37081-5	Soil	Hexavalent Chromium
NFS-PDI-X14BR-14.0-14.5	JC37081-6	Soil	Hexavalent Chromium
NFS-PDI-X14BR-16.0-16.5	JC37081-7	Soil	Hexavalent Chromium
NFS-PDI-X14BR-18.0-18.5	JC37081-8	Soil	Hexavalent Chromium
NFS-PDI-X14BR-2.0-2.5	JC37081-9	Soil	Hexavalent Chromium
NFS-PDI-X14BR-20.0-20.5	JC37081-10	Soil	Hexavalent Chromium
NFS-PDI-X14BR-4.0-4.5	JC37081-11	Soil	Hexavalent Chromium
NFS-PDI-X14BR-6.0-6.5	JC37081-12	Soil	Hexavalent Chromium
NFS-PDI-X14BR-8.0-8.5	JC37081-13	Soil	Hexavalent Chromium
NFS-PDI-Z14B-1.0-1.5	JC37081-14	Soil	Hexavalent Chromium
NFS-PDI-Z14B-10.0-10.5	JC37081-15	Soil	Hexavalent Chromium
NFS-PDI-Z14B-12.0-12.5	JC37081-16	Soil	Hexavalent Chromium
NFS-PDI-Z14B-14.0-14.5	JC37081-17	Soil	Hexavalent Chromium
NFS-PDI-Z14B-16.0-16.5	JC37081-18, 18R	Soil	Hexavalent Chromium
NFS-PDI-Z14B-18.0-18.5	JC37081-19, 19R	Soil	Hexavalent Chromium
NFS-PDI-Z14B-20.0-20.5	JC37081-20, 20R	Soil	Hexavalent Chromium
NFS-PDI-Z14B-3.0-3.5	JC37081-21, 21R	Soil	Hexavalent Chromium
NFS-PDI-Z14B-5.0-5.5	JC37081-22, 22R	Soil	Hexavalent Chromium
NFS-PDI-Z14B-6.5-7.0	JC37081-23, 23R	Soil	Hexavalent Chromium
NFS-PDI-Z14B-7.0-7.5	JC37081-24, 24R	Soil	Hexavalent Chromium
NFS-PDI-Z14B-8.0-8.5	JC37081-25, 25R	Soil	Hexavalent Chromium
NFS-PDI-Z14B-8.0-8.5X (Field Duplicate of NFS-PDI-Z14B-8.0-8.5)	JC37081-26, 26R	Soil	Hexavalent Chromium
NFS-PDI-Z15B-12.0-12.5	JC37081-27, 27R	Soil	Hexavalent Chromium
NFS-PDI-Z15B-14.0-14.5	JC37081-28, 28R	Soil	Hexavalent Chromium
NFS-PDI-Z15B-16.0-16.5	JC37081-29, 29R	Soil	Hexavalent Chromium

Field ID	Laboratory ID	Matrix	Fraction
NFS-PDI-Z15B-18.0-18.5	JC37081-30, 30R	Soil	Hexavalent Chromium
NFS-PDI-Z15B-20.0-20.5	JC37081-31, 31R	Soil	Hexavalent Chromium
NFS-PDI-Z15B-5.5-6.0	JC37081-32, 32R	Soil	Hexavalent Chromium
NFS-PDI-Z15B-6.0-6.5	JC37081-33, 33R	Soil	Hexavalent Chromium

The samples were collected following the procedures detailed in the Work Order for Garfield Avenue Remedial Action (GARA) at 70 Carteret Avenue, Jersey City, NJ and the Field Sampling Plan/Quality Assurance Project Plan for Non-Residential and Residential Chromium Sites Hudson County, New Jersey (December 2011).

General Comments

The data package was complete. Quality control (QC) issues identified during validation are discussed below. Refer to the Soil Target Analyte Summary Hit List(s) in Attachment A for a listing of all detected results, qualified results, and associated qualifications, where applicable. The nonconformances for each section discussed below are presented in Attachment B.

MS Results

There were two matrix spikes (MS) associated with the data in this SDG:

- NFS-PDI-X14BR-18.0-18.5 (JC37081-8) prep/analysis batch GP3281/GN59467; and
- NFS-PDI-Z14B-5.0-5.5 (JC37081-22/22R) initial prep/analysis and reanalysis prep/analysis batches GP3283/GN59484 and GP3382/GN59690, respectively.

MS samples are first associated with field samples using matrix similarities, then by analytical preparation batch when no matrix match is possible. The following table summarizes each of the MS samples, the field samples associated with each, and differentiates between those associated by matrix, and those associated by batch.

Spiked Sample	Samples Associated by Matrix	Samples Associated by Batch
NFS-PDI-X14BR-18.0-18.5 (JC37081-8)	JC37081-6, JC37081-7, JC37081-8, JC37081-10, JC37081-17, JC37081-18, JC37081-19, JC37081-20, JC37081-28, JC37081-29, JC37081-30, JC37081-31	JC37081-2, JC37081-4, JC37081-5, JC37081-9, JC37081-11, JC37081-12, JC37081-13, JC37081-14, JC37081-15, JC37081-16
NFS-PDI-Z14B-5.0-5.5 (JC37081-22)	JC37081-3, JC37081-22, JC37081-23, JC37081-32	JC37081-21, JC37081-24, JC37081-25, JC37081-26, JC37081-27, JC37081-33

NFS-PDI-X14BR-18.0-18.5 (JC37081-8)

The soluble and insoluble MS recoveries from the initial batch were 84.3% and 101.8%, respectively. Both MS recoveries met the quality control (QC) criteria of 75-125%R. The post-digestion spike (PDS) recovery was 103%, which met the PDS criteria of 85-115%.

All the associated samples were tested for pH and oxidation-reduction potential (ORP), and plotted on an Eh/pH phase diagram. From this chart, the source sample for the MS analysis was plotted below the phase change line, indicating a reducing potential within the sample matrix, incapable of supporting hexavalent chromium.

Since the MS and PDS recoveries met the MS and PDS QC requirements, the reported hexavalent chromium results associated with MS sample NFS-PDI-X14BR-18.0-18.5 (JC37081-8) were accepted without qualification on the basis of MS recovery. Refer to the table above for associated samples.

NFS-PDI-Z14B-5.0-5.5 (JC37081-22/22R)

The soluble and insoluble MS recoveries from the initial batch by Method 7196 were 0.2% and 44.5%, respectively. Both MS recoveries failed to meet the QC criteria of 75-125%, and were less than 50%. The PDS recovery was 35%, and after pH adjustment was 50%, which did not meet the PDS criteria of 85-115%.

Based on the very low MS and PDS recoveries, the samples were reanalyzed using Method 7199. The soluble and insoluble MS results from the reanalysis were 0.5% and 5.5%, respectively. Both MS recoveries failed to meet the QC criteria of 75-125%, and were less than 50%. The PDS recovery was 96.5%, which met the PDS criteria of 85-115%.

Since the initial PDS and initial and reanalysis MS recoveries failed to meet QC criteria, additional parameters were analyzed to determine if matrix interference could be the cause for the poor matrix spike recoveries. All samples included in this sample data group (SDG) were tested for pH and ORP, and plotted on an Eh/pH phase diagram. From this chart, the source sample for the matrix spike analysis was plotted below the phase change line, indicating reducing potential within the sample matrix, incapable of supporting hexavalent chromium. To confirm the oxidizing/reducing potential within the sample matrix, the additional ancillary parameters ferrous iron, sulfide screen, and total organic carbon (TOC) were analyzed for the matrix spike source sample. The sulfide screen was reported as nondetect, indicating no reducing agents within the sample matrix; however, the ferrous iron (7.6%) and the TOC results (7680 mg/kg) were positive, indicating potential reducing agents within the sample matrix.

Since both soluble and insoluble MS recoveries were <50% in the initial analysis by method 7196 and reanalysis by method 7199, all soil hexavalent chromium results associated with MS sample NFS-PDI-Z14B-5.0-5.5 (JC37081-22) were rejected (RA) but may be usable for site decisions. The highest detected hexavalent chromium result between the initial and reanalysis, or the nondetect hexavalent chromium result with the lowest RL was reported for each soil sample. Refer to the table above for associated samples.

No further qualification was taken based on the low initial PDS recovery since the reanalysis PDS %R was acceptable.

Sample Results

Reported results (flagged B by the laboratory) that were less than the reporting limit (RL), but greater than or equal to the method detection limit (MDL) are approximate values and have been qualified as estimated (J).

Data Quality and Usability

The results for hexavalent chromium in all soil samples associated with MS sample NFS-PDI-Z14B-5.0-5.5 (JC37081-22) were rejected; however, the results may be usable for project objectives as discussed below. In general, the remaining data appear to be valid and may be used for decision-making purposes. Qualified, rejected, and detected results are presented in Attachments A and B.

The hexavalent chromium soil results associated with MS sample NFS-PDI-X14BR-18.0-18.5 (JC37081-8) were accepted without qualification on the basis of MS recovery.

Based on the initial and reanalysis soluble and insoluble MS recoveries, hexavalent chromium soil results associated with MS sample NFS-PDI-Z14B-5.0-5.5 (JC37081-22) were rejected. However, based on the reducing potential of the sample matrix shown by the Eh/pH phase diagram and the additional ancillary parameters, there is evidence to suggest that the matrix for this sample was reducing and not capable of supporting hexavalent chromium. Therefore, although the sample results were rejected based on MS %Rs, these results may be usable for site decisions. The highest detected hexavalent chromium result between the initial and reanalysis, or the nondetect hexavalent chromium result with the lowest RL was reported for each associated soil sample.

Sample results reported between the MDL and RL were qualified estimated with an unknown directional bias.

ATTACHMENTS

Attachment A: Target Analyte Summary Hit List(s)

Attachment B: Data Validation Report Form

Attachment A

Target Analyte Summary Hit List(s)

Soil Target Analyte Summary Hit List (Hexavalent Chromium)

Site Name North Forrest Street Supplemental PDI Sampling
Sampling Date February 12, 2017
Lab Name/ID SGS/Accutest, Dayton, NJ
SDG No JC37081 and JC37081R
Sample Matrix Soil
Trip Blank ID NA
Field Blank ID NFS-FB20170212

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
NFS-PDI-X14BR-0.5-1.0	JC37081-2	CHROMIUM (HEXAVALENT)	U	12.9	12.9	0.64		
NFS-PDI-X14BR-10.0-10.5	JC37081-3	CHROMIUM (HEXAVALENT)	U	U	RA	0.56	Reject	1
NFS-PDI-X14BR-12.0-12.5	JC37081-5	CHROMIUM (HEXAVALENT)	U	1.2	1.2	0.49		
NFS-PDI-X14BR-14.0-14.5	JC37081-6	CHROMIUM (HEXAVALENT)	U	0.44B	0.44	0.47	Qualify	2
NFS-PDI-X14BR-16.0-16.5	JC37081-7	CHROMIUM (HEXAVALENT)	U	1.7	1.7	0.46		
NFS-PDI-X14BR-20.0-20.5	JC37081-10	CHROMIUM (HEXAVALENT)	U	1.3	1.3	0.48		
NFS-PDI-X14BR-4.0-4.5	JC37081-11	CHROMIUM (HEXAVALENT)	U	0.36B	0.36	0.52	Qualify	2
NFS-PDI-X14BR-6.0-6.5	JC37081-12	CHROMIUM (HEXAVALENT)	U	0.71	0.71	0.49		
NFS-PDI-X14BR-8.0-8.5	JC37081-13	CHROMIUM (HEXAVALENT)	U	10.4	10.4	0.49		
NFS-PDI-Z14B-16.0-16.5	JC37081-18	CHROMIUM (HEXAVALENT)	U	0.81	0.81	0.46		
NFS-PDI-Z14B-5.0-5.5	JC37081-22	CHROMIUM (HEXAVALENT)	U	0.41B	RA	0.49	Reject	1,2
NFS-PDI-Z14B-6.5-7.0	JC37081-23	CHROMIUM (HEXAVALENT)	U	0.42B	RA	0.60	Reject	1,2
NFS-PDI-Z15B-16.0-16.5	JC37081-29	CHROMIUM (HEXAVALENT)	U	0.37B	0.37	0.47	Qualify	2
NFS-PDI-Z15B-5.5-6.0	JC37081-32	CHROMIUM (HEXAVALENT)	U	1.4	RA	0.52	Reject	1
NFS-PDI-Z14B-18.0-18.5	JC37081-19R	CHROMIUM (HEXAVALENT)	U	0.44B	0.44	0.45	Qualify	2
NFS-PDI-Z14B-20.0-20.5	JC37081-20R	CHROMIUM (HEXAVALENT)	U	2.5	2.5	0.48		
NFS-PDI-Z14B-3.0-3.5	JC37081-21R	CHROMIUM (HEXAVALENT)	U	U	RA	0.45	Reject	1

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
NFS-PDI-Z14B-7.0-7.5	JC37081-24R	CHROMIUM (HEXAVALENT)	U	2.8	RA	0.55	Reject	1
NFS-PDI-Z14B-8.0-8.5	JC37081-25R	CHROMIUM (HEXAVALENT)	U	U	RA	0.54	Reject	1
NFS-PDI-Z14B-8.0-8.5X	JC37081-26R	CHROMIUM (HEXAVALENT)	U	U	RA	0.51	Reject	1
NFS-PDI-Z15B-12.0-12.5	JC37081-27R	CHROMIUM (HEXAVALENT)	U	0.75	RA	0.47	Reject	1
NFS-PDI-Z15B-14.0-14.5	JC37081-28R	CHROMIUM (HEXAVALENT)	U	0.67	0.67	0.49		
NFS-PDI-Z15B-18.0-18.5	JC37081-30R	CHROMIUM (HEXAVALENT)	U	0.50	0.50	0.49		
NFS-PDI-Z15B-20.0-20.5	JC37081-31R	CHROMIUM (HEXAVALENT)	U	0.58	0.58	0.50		
NFS-PDI-Z15B-6.0-6.5	JC37081-33R	CHROMIUM (HEXAVALENT)	U	0.16B	RA	0.59	Reject	1,2

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

NJDEP Laboratory Footnote

1. The result was rejected because the soluble and insoluble MS recoveries were less than 50%.
2. The reported result was greater than the MDL but less than the RL and qualified as estimated.

Attachment B

Data Validation Report Form

Client Name: PPG Industries	Project Number: 60314351.GA.DE.PDI.NFS
Site Location: North Forrest Street Supplemental PDI Sampling, Jersey City, NJ	Project Manager: Scott Mikaelian
Laboratory: Accutest, Dayton, NJ	Type of Validation: Full
Laboratory Job No: JC37081 and JC37081R	Date Checked: 02/24/2017
Validator: Sharon McKechnie	Peer: Kristin Rutherford

ITEM	YES	NO	N/A	COMMENTS
Sample results included?	X			
Reporting Limits met project requirements?	X			
Field I.D. included?	X			
Laboratory I.D. included?	X			
Did data package sample IDs match sample IDs on COC?	X			
Did electronic data deliverable (EDD) sample IDs match COC sample IDs?	X			
Did data package sample IDs match electronic data deliverable (EDD) sample IDs?	X			
Sample matrix included?	X			
Sample receipt temperature 2-6°C?	X			
Signed COCs included?	X			
Date of sample collection included?	X			
Date of sample digestion included?	X			
Holding time to digestion met criteria? (Soils -30 days from collection to digestion.)	X			
Date of analysis included?	X			
Holding time to analysis met criteria? (Soils -168 hours from digestion to analysis; Aqueous - 24 hours from collection to analysis.)	X			
Method reference included?	X			
Laboratory Case Narrative included?	X			

Definitions: MDL - Method Detection Limit; %R - Percent Recovery; RL - Reporting Limit; RPD - Relative Percent Difference; RSD - Relative Standard Deviation ;Corr - Correlation Coefficient.

ITEM	YES	NO	N/A	COMMENTS
Initial calibration documentation included in lab package?	X			
1) Blank plus 4 standards (7196A) or blank plus 3 standards (7199)	X			
2) Correlation coefficient of >0.995 (7196A) or >0.999 (7199)	X			
3) Calibrate daily or each time instrument is set up.	X			
Calibration Check Standard (CCS) for 7196A and Quality Control Sample (QCS) for 7199 Included in Lab Package?	X			
1) %R criteria met? (90 - 110%)	X			
2) Correct frequency of one per every 10 samples	X			
3) CCS and QCS from independent source and at mid- level of calibration curve	X			
Calibration Blanks	X			
1) Analyzed prior to initial calibration standards and after each CCS/QCS?	X			
2) Absolute value should not exceed MDL.	X			
Method Blank, Field Blanks and/or Equipment Blanks Included in Lab Package?	X			
1) Method blank analyzed with each preparation batch?	X			
2) Absolute value should not exceed MDL.	X			
Eh and pH Data	X			
1) Eh and pH data was included and plotted for all samples?	X			
Soluble Matrix Spike Data Included in Lab Package?	X			JC37081-8/22/22R
1) Soluble Matrix %R criteria met? (75-125%R).	X*	X		*JC37081-8 met criteria. See table
2) Was the spike concentration 40 mg/Kg or twice the sample concentration?		X		JC37081-8 spiked at 47.7 mg/kg. JC37081-22/22R spiked at 49.5 mg/kg and 47.6 mg/kg, respectively. The data was not affected.
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	X			

ITEM	YES	NO	N/A	COMMENTS
Insoluble Matrix Spike Data Included in Lab Package?	X			JC37081-8/22/22R
1) Insoluble Matrix %R criteria met? (75-125%R).	X*	X		*JC37081-8 met criteria. See table
2) Was the spike concentration around 400 to 800 mg/Kg?		X		JC37081-8 spiked at 972 mg/kg. JC37081-22/22R spiked at 1020 mg/kg and 971 mg/kg, respectively. The data was not affected.
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	X			
Post Digestion Spike	X			JC37081-8/22/22R
1) Post Digestion Spike %R criteria met? (85-115%R).	X			See table
2) Was the spike concentration 40 mg/Kg or twice the sample concentration?	X			
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	X			
Sample Duplicate Data Included in Lab Package?	X			JC37081-8/22/22R
1) RPD criteria met? (RPD < 20%) if both results are ≥4x RL or control limit of ± RL if both results are <4xRL.	X			See table
2) Was a sample duplicate analyzed at the frequency of 1 per batch or 20 samples?	X			
Was a Laboratory Control Sample (LCS) Included in Lab Package?	X			
1) %R criteria met? (80-120%R).	X			
2) Was an LCS analyzed at the frequency of 1/batch or 20 samples?	X			
Were any Field Duplicate samples submitted with this SDG?	X			JC37081-25R/26R
1) RPD criteria met? (RPD < 20%) if both results are ≥4x RL or control limit of ± RL if both results are <4xRL.	X			See Table
Were all sample quantitation and reporting requirements met?	X			
1) Were all solid samples reported with percent solids > 50%?	X			All OK, no table.
2) Were any samples analyzed or reported with dilutions?		X		

Miscellaneous Items	X			
1) For soils by 7196A, was the pH within a range of 7.0-8.0?	X			
2) For soils by 7199, was the pH within a range of 9.0-9.5?	X			
3) For aqueous by 7196A, was the pH with a range of 1.5-2.5?	X			
4) For soils (3060A), was the digestion temperature 90-95C for at least 60 minutes?	X			
5) For 7199, was each sample injected twice and was the RPD ≤20?	X			See Table

Matrix Spikes

Sample ID	Lab ID	Analyte	Matrix Spike	% Recovery	Lower Limit	Upper Limit	PDS%/pH Adj PDS%	PDS Limits
NFS-PDI-X14BR-18.0-18.5	JC37081-8	CHROMIUM (HEXAVALENT)	Soluble	84.3	75	125	103/NA	85-115
NFS-PDI-X14BR-18.0-18.5	JC37081-8	CHROMIUM (HEXAVALENT)	Insoluble	101.8				
NFS-PDI-Z14B-5.0-5.5	JC37081-22	CHROMIUM (HEXAVALENT)	Soluble	0.2			35/50	
NFS-PDI-Z14B-5.0-5.5	JC37081-22	CHROMIUM (HEXAVALENT)	Insoluble	44.5				
NFS-PDI-Z14B-5.0-5.5	JC37081-22R	CHROMIUM (HEXAVALENT)	Soluble	0.5			96.5/NA	
NFS-PDI-Z14B-5.0-5.5	JC37081-22R	CHROMIUM (HEXAVALENT)	Insoluble	5.5				

Lab Duplicates

Sample ID	Lab ID	Analyte	Sample Result	Duplicate Result	QL	Units	RPD (%)	Action
NFS-PDI-X14BR-18.0-18.5	JC37081-8	CHROMIUM (HEXAVALENT)	ND	ND	0.47	mg/kg	NC	Both Nondetect (ND), Accept
NFS-PDI-Z14B-5.0-5.5	JC37081-22	CHROMIUM (HEXAVALENT)	0.41	0.45	0.49	mg/kg	9.3	RPD<20%, Accept
NFS-PDI-Z14B-5.0-5.5	JC37081-22R	CHROMIUM (HEXAVALENT)	ND	0.18	0.48	mg/kg	NC	RPD Not Calculable (NC), Detected Result <4X RL, Accept

Field Duplicate

Sample ID	Result	RL	Dup Sample ID	Dup Result	Dup RL	Units	RPD (%)	Action
JC37081-25R	ND	0.54	JC37081-26R	ND	0.51	mg/kg	NC	Both ND, Accept

7199 RPDs

Sample ID	Rep 1 (ppm)	Rep 2 (ppm)	RPD%	RPD (%)	Absolute Difference (ppm)
JC37081-18R	0.00897	0.00902	0.6%	RPD<20%, Accept	
JC37081-19R	0.00972	0.0094	3.3%	RPD<20%, Accept	
JC37081-20R	0.0527	0.05259	0.2%	RPD<20%, Accept	
JC37081-21R	0.00152	0.00122	21.9%	Absolute Difference <RL, Accept	0.000300
JC37081-22R	0.0017	0.00218	24.7%	Absolute Difference <RL, Accept	0.000480
JC37081-23R	0.0015	0.0018	18.2%	RPD<20%, Accept	
JC37081-24R	0.05066	0.05203	2.7%	RPD<20%, Accept	
JC37081-25R	0.0008	0.00115	35.9%	Absolute Difference <RL, Accept	0.000350
JC37081-26R	0.00134	0.00141	5.1%	RPD<20%, Accept	
JC37081-27R	0.01524	0.01602	5.0%	RPD<20%, Accept	
JC37081-28R	0.01268	0.01346	6.0%	RPD<20%, Accept	
JC37081-29R	0.00196	0.00211	7.4%	RPD<20%, Accept	
JC37081-30R	0.00939	0.01036	9.8%	RPD<20%, Accept	
JC37081-31R	0.01116	0.01156	3.5%	RPD<20%, Accept	
JC37081-32R	0.00282	0.00244	14.4%	RPD<20%, Accept	
JC37081-33R	0.0027	0.00164	48.8%	Absolute Difference <RL, Accept	0.001060

SDG#: JC37081/ Method 7196

Batch: GN59467

Cr+6 ICAL 2/16/17

Soil

(p. 113 of data pkg)

x - concentration	y - response
0	0
0.01	0.01
0.05	0.042
0.1	0.083
0.3	0.243
0.5	0.401
0.8	0.637
1	0.818

(p. 113 of data pkg)

AECOM Calculated Offset	0.0004	OK	Reported Offset	0.0004
AECOM Slope	0.8081	OK	Reported Slope	0.8081
AECOM Calculated r	0.99985	OK	Reported r	0.99985

LCS calculation

GP3281-B1

P. 79,113

Background Absorbance	0
Total absorbance	0.72
Total absorbance - background	0.72
Instrument Concentration	0.890
Sample weight (mg/kg)	0.0025
Final Volume (L)	0.1
Dilution Factor	1

AECOM Calculated LCS Result (mg/Kg)	35.6	OK	Reported Result (mg/Kg)	35.6
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%R = Found/True*100

GP3281-B1

P. 79,113

True Value (mg/kg)	40
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AECOM Calculated %R	89.0	OK	Reported %R	89.0
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MS calculation

GP3237-S2

P. 81,113

JC37081-8

Background reading	0.001
Total absorbance	0.683
Total absorbance - background	0.682
Instrument Concentration	0.8434
Sample weight (mg/kg)	0.00245
Final Volume (L)	0.1
Percent solids	0.856
Dilution Factor	1

AECOM Calculated MS Result (mg/Kg)	40.2	OK	Reported Result (mg/Kg)	40.2
------------------------------------	------	----	-------------------------	------

%R = Found/True*100

GP3237-S2

P. 81,113

JC37081-8

True Value (mg/kg)	47.7
Native concentration (mg/kg)	0

AECOM %R	84.3	OK	Reported %R	84.3
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Percent Solids	JC37081-8	P. 83	NFS-PDI-X14BR-18.0-18.5
Empty dish weight=		24.12	
Wet weight=		31.71	
Dry weight=		30.62	
AECOM %solids =		85.6	OK Reported %solids= 85.6

Reporting Limit	JC37081-8	P. 22,113	NFS-PDI-X14BR-18.0-18.5
Low Standard		0.01	
Initial weight (mg/kg)		0.00249	
Final volume (L)		0.1	
Percent solids		0.856	
Dilution Factor		1	
Reporting Limit		0.47	OK Reported RL (mg/Kg)= 0.47

Sample Calculations	JC37081-8	P. 22,113	NFS-PDI-X14BR-18.0-18.5
Background reading		0.003	
Total absorbance		0.006	
Total absorbance - background		0.003	
Instrument Response		0.003	
Sample weight (mg/kg)		0.00249	
Final Volume (L)		0.1	
Percent solids		0.856	
Dilution Factor		1	
AECOM Calculated Result (mg/Kg)		0.15	OK, Reported as Nondetect Reported Result (mg/Kg) 0.33 U

SDG#: JC37081/ Method 7196
Batch: GN59484
 Cr+6 ICAL 2/16/17
 Soil
 (p. 121 of data pkg)

x - concentration	y - response
0	0
0.01	0.01
0.05	0.042
0.1	0.083
0.3	0.243
0.5	0.401
0.8	0.637
1	0.818

(p. 121 of data pkg)

AECOM Calculated Offset	0.0004	OK	Reported Offset	0.0004
AECOM Slope	0.8081	OK	Reported Slope	0.8081
AECOM Calculated r	0.99985	OK	Reported r	0.99985

LCS calculation	GP3283-B1	P. 79,121			
Background Absorbance		0			
Total absorbance		0.766			
Total absorbance - background		0.766			
Instrument Concentration		0.947			
Sample weight (mg/kg)		0.0025			
Final Volume (L)		0.1			
Dilution Factor		1			
AECOM Calculated LCS Result (mg/Kg)		37.9	OK	Reported Result (mg/Kg)	37.9

%R = Found/True*100	GP3283-B1	P. 79,121		
True Value (mg/kg)	40			
AECOM Calculated %R	94.7	OK, rounding	Reported %R	94.8

MS calculation	GP3283-S1	P. 81,121	JC37081-22	
Background reading	0.047			
Total absorbance	0.056			
Total absorbance - background	0.009			
Instrument Concentration	0.0106			
Sample weight (mg/kg)	0.00248			
Final Volume (L)	0.1			
Percent solids	0.815			
Dilution Factor	1			
AECOM Calculated MS Result (mg/Kg)	0.52	OK	Reported Result (mg/Kg)	0.52

%R = Found/True*100	GP3283-S1	P. 81,121	JC37081-22	
True Value (mg/kg)	49.5			
Native concentration (mg/Kg)	0.41			
AECOM%R	0.2	OK	Reported %R	0.2

Percent Solids	JC37081-22	P. 85	NFS-PDI-Z14B-5.0-5.5	
Empty dish weight=	21.77			
Wet weight=	27.94			
Dry weight=	26.8			
AECOM %solids =	81.5	OK	Reported %solids=	81.5

Reporting Limit	JC37081-22	P. 36,121	NFS-PDI-Z14B-5.0-5.5	
Low Standard	0.01			
Initial weight (mg/kg)	0.00245			
Final volume (L)	0.1			
Percent solids	0.815			
Dilution Factor	1			
Reporting Limit	0.50	OK, rounding	Reported RL (mg/Kg)=	0.49

Sample Calculations	JC37081-22	P. 36,121	NFS-PDI-Z14B-5.0-5.5	
Background reading	0.042			
Total absorbance	0.049			
Total absorbance - background	0.007			
Instrument Response	0.008			
Sample weight (mg/kg)	0.00245			
Final Volume (L)	0.1			
Percent solids	0.815			
Dilution Factor	1			
AECOM Calculated Result (mg/Kg)	0.41	OK	Reported Result (mg/Kg)	0.41

SDG: JC37081R/ Method 7199
Batch GN59690
 Cr+6 ICAL 2/21/17
 Soil
 (p. 110-115 of data package)

x - value	y - value
0.00	0.0110
0.005	0.0617
0.05	0.4340
0.1	0.9104
0.5	4.4864

STDA
 STDB
 STDC
 STDD
 STDE

(p. 110-115 of data package)

AECOM Calculated Offset	0.0073	OK	Reported Offset	0.0073
AECOM Slope	8.9571	OK, rounding	Reported Slope	8.9570
AECOM Calculated r	1.0000	OK	Reported r	1.0000

LCS calculation			
	GP3346-B1	P. 47,142	
Highest replicate response (AREA, mAU*min)	1.924		
Instrument Concentration (ug/L)	0.214		
Sample weight	0.0025		
Percent solids	1		
Dilution Factor	4		
AECOM Calculated LCS Result (mg/Kg)	34.2	OK	Reported Result (mg/Kg) 34.2
%R = Found/True*100			
	GP3346-B1	P. 47,142	
True Value (mg/kg)	40		
AECOM Calculated %R	85.6	OK, rounding	Reported %R 85.5
MS calculation			
	GP3346-S1	P. 49,134	JC37081-22R
Highest replicate response (mAU*min)	0.053		
Instrument Concentration (ug/L)	0.0051		
Sample weight	0.00258		
Percent solids	0.815		
Dilution Factor	1		
AECOM Calculated MS Result (mg/Kg)	0.24	OK	Reported Result (mg/Kg) 0.24
%R = Found/True*100			
	GP3346-S1	P. 49,134	JC37081-22R
True Value (mg/kg)	47.6		
Native concentration (mg/Kg)	0		
%R	0.5	OK	Reported %R 0.5
Percent Solids			
	JC37081-22R	P. 58	NFS-PDI-Z14B-5.0-5.5
Empty dish weight=	21.77		
Wet weight=	27.94		
Dry weight=	26.8		
AECOM %solids =	81.5	OK	Reported %solids= 81.5
Reporting limit			
	JC37081-22R	P. 14, 102	NFS-PDI-Z14B-5.0-5.5
Low Standard	0.01		
Initial weight (g)	0.00253		
Final volume (L)	0.1		
Percent solids	0.815		
Dilution Factor	1		
Reporting Limit	0.48	OK	Reported RL (mg/Kg)= 0.48
Sample Calculations			
	JC37081-22R	P.14, 132	NFS-PDI-Z14B-5.0-5.5
Background reading from highest response	0		
Instrument Response highest response	0.027		
Total response for replicate 1	0.027		
Instrument Response (mg/L)	0.002		
Sample weight (mg)	0.00253		
Final Volume (L)	0.1		
Percent solids	0.815		
Dilution Factor	1		
AECOM Calculated Result (mg/Kg)	0.11	OK reported as Nondetect	Reported Result (mg/Kg) 0.13 U

Data Validation Report

Project: North Forrest Street Supplemental PDI Sampling

Laboratory: SGS/Accutest, Dayton, NJ

Laboratory Job No.: JC37110 and JC37110R

Analysis/Method: Hexavalent Chromium SW846 3060A/7196A

Validation Level: Full

Site Location/Address: 70 Carteret Avenue, Jersey City, NJ

AECOM Project No: 60314351.GA.DE.PDI.NFS

Prepared by: Charlene Livingston Flint /AECOM Completed on: 02/24/2017

Reviewed by: Sharon McKechnie /AECOM File Name: JC37110_R_2017-02-24_DVReport-F

Introduction

The data were reviewed in accordance with the FSP-QAPP and the following NJDEP validation Standard Operating Procedure (SOP):

- NJDEP Office of Data Quality SOP 5.A.10, Rev 3 (September 2009), SOP for Analytical Data Validation of Hexavalent Chromium - for USEPA SW-846 Method 3060A, USEPA SW-846 Method 7196A.

The results of quality control data analyzed with site samples were used to assess the overall reliability of the data. The following qualifiers were used to identify data quality issues:

- U: Indicates the analyte was not detected in the sample above the sample reporting limit.
- J: Indicates the result was an estimated value; the associated numerical value was an approximate concentration of the analyte in the sample.
- UJ: Indicates the analyte was not detected above the reporting limit and the reporting limit was approximate.
- UB: The analyte concentration is less than or equal to three (3) times the concentration in the associated method/prep blank. The presence of the analyte in the sample is negated (UB) due to laboratory contamination.
- JB: The analyte concentration is greater than three (3) times, but less than or equal to ten (10) times the concentration in the associated method/prep blank. The presence of that analyte in the sample is considered "real". The concentration is quantitatively qualified (JB) due to method blank contamination.
- R: The sample result was rejected due to serious deficiencies; the presence or absence of the analyte could not be confirmed.
- RA: The sample result was rejected but is still considered usable.

Sample Information

The samples listed below were collected by AECOM on February 13, 2017 as part of the North Forrest Street Supplemental PDI Sampling at 70 Carteret Avenue, Jersey City, New Jersey. Only the samples and parameters listed below were validated.

Field ID	Laboratory ID	Matrix	Fraction
NFS-FB20170213 (Equipment Blank)	JC37110-1	Aqueous	Hexavalent Chromium
NFS-PDI-DD11BR-10.0-10.5	JC37110-2, -2R	Soil	Hexavalent Chromium
NFS-PDI-DD11BR-10.0-10.5X (Field Duplicate of NFS-PDI-DD11BR-10.0-10.5)	JC37110-3, -3R	Soil	Hexavalent Chromium
NFS-PDI-DD11BR-12.0-12.5	JC37110-4, -4R	Soil	Hexavalent Chromium
NFS-PDI-DD11BR-14.0-14.5	JC37110-5, -5R	Soil	Hexavalent Chromium
NFS-PDI-DD11BR-16.0-16.5	JC37110-6, -6R	Soil	Hexavalent Chromium
NFS-PDI-DD11BR-18.0-18.5	JC37110-7, -7R	Soil	Hexavalent Chromium
NFS-PDI-DD11BR-2.5-3.0	JC37110-8, -8R	Soil	Hexavalent Chromium
NFS-PDI-DD11BR-20.0-20.5	JC37110-9, -9R	Soil	Hexavalent Chromium
NFS-PDI-DD11BR-4.0-4.5	JC37110-10, -10R	Soil	Hexavalent Chromium
NFS-PDI-DD11BR-5.5-6.0	JC37110-11, -11R	Soil	Hexavalent Chromium
NFS-PDI-DD11BR-6.0-6.5	JC37110-12, -12R	Soil	Hexavalent Chromium
NFS-PDI-DD11BR-8.0-8.5	JC37110-13, -13R	Soil	Hexavalent Chromium

The samples were collected following the procedures detailed in the Work Order for Garfield Avenue Remedial Action (GARA) at 70 Carteret Avenue, Jersey City, NJ and the Field Sampling Plan/Quality Assurance Project Plan for Non-Residential and Residential Chromium Sites Hudson County, New Jersey (December 2011).

General Comments

The data package was complete. Quality control (QC) issues identified during validation are discussed below. Refer to the Target Analyte Summary Hit List(s) in Attachment A for a listing of all detected results, qualified results, and associated qualifications, where applicable. The nonconformances for each section discussed below are presented in Attachment B.

MS Results

Sample NFS-PDI-DD11BR-12.0-12.5 (JC37110-4) was selected for the soil matrix spike analysis and used for supporting data quality recommendations. The soluble and insoluble matrix spike (MS) recoveries from the initial batch were 65.3% and 94.7%, respectively. The soluble MS recovery did not meet quality control (QC) criteria of 75-125%R. The post digestion spike (PDS) recovery was 106%, which met the PDS criteria of 85-115%.

Based on poor MS recoveries, less than 75%R, the MS and associated samples were reanalyzed using Method 7196. The soluble and insoluble matrix spike recoveries from the re-analysis were 205.7% and 91.5%, respectively. The soluble MS recovery exceeded the QC criteria of 75-125%R. The post spike result for the re-analysis batch was recovered at 94%, which met the PDS criteria of 85-115%.

Since the soluble and/or insoluble MS recoveries were outside the acceptable QC limit of 75-125%, additional parameters were analyzed to determine if possible matrix interferences could be the cause for the poor matrix spike recoveries. All the soil samples were tested for pH and oxidation reduction potential (ORP) and plotted on an Eh/pH phase diagram chart. From this chart, the source sample for the matrix spike analysis was plotted below the phase change line, indicating reducing potential within the sample matrix, incapable of supporting hexavalent chromium. Analyses for ferrous iron, sulfide screen, and total organic carbon (TOC) were performed on the MS source sample to confirm the oxidizing/reducing potential within the sample matrix. The sulfide screen was reported as nondetect, indicating no reducing agents within the sample matrix; however, the ferrous iron (0.27 %) and the TOC results (88.5 mg/Kg) were positive, indicating potential reducing agents within the sample matrix.

Since the MS recoveries from both the initial and reanalysis did not meet the MS QC requirements, but at least one MS recovery was greater than 50%, the reported hexavalent chromium results were qualified as estimated (J/UJ) due to the MS recoveries. Since there were both high and low MS recoveries, the direction of bias is uncertain. The highest detected hexavalent chromium result or the nondetect hexavalent chromium result with the lowest reporting limit (RL) was reported for each soil sample

Laboratory Duplicate Precision

Sample NFS-PDI-DD11BR-12.0-12.5 (JC37110-4) was selected by the laboratory to demonstrate laboratory precision capabilities.

The relative percent difference for hexavalent chromium exceeded the QC acceptance RPD in the reanalysis; therefore, the hexavalent chromium results in the soil samples reported from the reanalysis were qualified as estimated (J).

Sample Results

Reported results (flagged B by the laboratory) that were less than the reporting limit (RL), but greater than or equal to the method detection limit (MDL) are approximate values and have been qualified as estimated (J).

Data Quality and Usability

In general, these data appear to be valid and may be used for decision-making purposes. No data were rejected. Qualified and detected results, are presented in Attachments A and B.

The hexavalent chromium soil results in this SDG are usable as estimated values due to MS recoveries, and since the MS sample matrix appears to be reducing based on the Eh-pH plot and the presence of TOC and ferrous iron. The highest detected hexavalent chromium result or the nondetect hexavalent chromium result with the lowest reporting limit (RL) was reported for each soil sample.

Sample results qualified due to poor laboratory duplicate precision are usable as estimated values with an unknown directional bias.

Sample results reported between the MDL and RL are usable as estimated values with an unknown directional bias.

ATTACHMENTS

Attachment A: Target Analyte Summary Hit List(s)

Attachment B: Data Validation Report Form

Attachment A

Target Analyte Summary Hit List(s)

Soil Target Analyte Summary Hit List (Hexavalent Chromium)

Site Name North Forrest Street Supplemental PDI Sampling
Sampling Date February 13, 2017
Lab Name/ID SGS/Accutest, Dayton, NJ
SDG No JC37110 and JC37110R
Sample Matrix Soil
Trip Blank ID NA
Field Blank ID NFS-FB20170213

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
NFS-PDI-DD11BR-10.0-10.5	JC37110-2	CHROMIUM (HEXAVALENT)	U	7.5	7.5	0.47	Qualify	1
NFS-PDI-DD11BR-10.0-10.5X	JC37110-3R	CHROMIUM (HEXAVALENT)	U	6.4	6.4	0.47	Qualify	2,3
NFS-PDI-DD11BR-12.0-12.5	JC37110-4	CHROMIUM (HEXAVALENT)	U	70.5	70.5	2.4	Qualify	1
NFS-PDI-DD11BR-14.0-14.5	JC37110-5	CHROMIUM (HEXAVALENT)	U	43.5	43.5	0.49	Qualify	1
NFS-PDI-DD11BR-16.0-16.5	JC37110-6R	CHROMIUM (HEXAVALENT)	U	15.3	15.3	0.50	Qualify	2,3
NFS-PDI-DD11BR-18.0-18.5	JC37110-7	CHROMIUM (HEXAVALENT)	U	28.0	28.0	0.50	Qualify	1
NFS-PDI-DD11BR-2.5-3.0	JC37110-8	CHROMIUM (HEXAVALENT)	U	U	UJ	0.51	Qualify	1
NFS-PDI-DD11BR-20.0-20.5	JC37110-9	CHROMIUM (HEXAVALENT)	U	0.54	0.54	0.50	Qualify	1
NFS-PDI-DD11BR-4.0-4.5	JC37110-10	CHROMIUM (HEXAVALENT)	U	U	UJ	0.48	Qualify	1
NFS-PDI-DD11BR-5.5-6.0	JC37110-11R	CHROMIUM (HEXAVALENT)	U	0.54	0.54	0.47	Qualify	2,3
NFS-PDI-DD11BR-6.0-6.5	JC37110-12	CHROMIUM (HEXAVALENT)	U	U	UJ	0.46	Qualify	1
NFS-PDI-DD11BR-8.0-8.5	JC37110-13R	CHROMIUM (HEXAVALENT)	U	0.38B	0.38	0.49	Qualify	2,3,4

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

NJDEP Laboratory Footnote

1. The reported value was qualified because the MS spike recovery was less than 75 %, but greater than 50%.
2. The reported value was qualified because the MS spike recovery was greater than 125 percent.
3. In the Duplicate Sample Analysis, Hexavalent Chromium fell outside the control limits of ≤ 20 percent for sample results $> 4 \times \text{RL}$. Therefore, the result was qualified.
4. The reported result was greater than the MDL but less than the RL and qualified (J) as estimated by the laboratory.

Attachment B

Data Validation Report Form

Client Name: PPG Industries		Project Number: 60314351.GA.DE.PDI.NFS		
Site Location: North Forrest Street Supplemental PDI Sampling , Jersey City, NJ		Project Manager: Scott Mikaelian		
Laboratory: SGS/Accutest, Dayton, NJ		Type of Validation: Full		
Laboratory Job No: JC37110 and JC37110R		Date Checked: 02/24/2017		
Validator: Charlene Livingston Flint		Peer: Sharon McKechnie		
ITEM	YES	NO	N/A	COMMENTS
Sample results included?	X			
Reporting Limits met project requirements?	X			
Field I.D. included?	X			
Laboratory I.D. included?	X			
Did data package sample IDs match sample IDs on COC?	X			
Did electronic data deliverable (EDD) sample IDs match COC sample IDs?	X			
Did data package sample IDs match electronic data deliverable (EDD) sample IDs?	X			
Sample matrix included?	X			
Sample receipt temperature 2-6°C?	X			3.9 °C
Signed COCs included?	X			
Date of sample collection included?	X			
Date of sample digestion included?	X			
Holding time to digestion met criteria? (Soils -30 days from collection to digestion.)	X			
Date of analysis included?	X			
Holding time to analysis met criteria? (Soils -168 hours from digestion to analysis; Aqueous - 24 hours from collection to analysis.)	X			
Method reference included?	X			
Laboratory Case Narrative included?	X			
Definitions: MDL - Method Detection Limit; %R - Percent Recovery; RL - Reporting Limit; RPD - Relative Percent Difference; RSD - Relative Standard Deviation ;Corr - Correlation Coefficient.				

ITEM	YES	NO	N/A	COMMENTS
Initial calibration documentation included in lab package?	X			
1) Blank plus 4 standards (7196A) or blank plus 3 standards (7199)	X			
2) Correlation coefficient of =0.995 (7196A) or =0.999 (7199)	X			
3) Calibrate daily or each time instrument is set up.	X			
Calibration Check Standard (CCS) for 7196A and Quality Control Sample (QCS) for 7199 Included in Lab Package?	X			
1) %R criteria met? (90 - 110%)	X			
2) Correct frequency of one per every 10 samples	X			
3) CCS and QCS from independent source and at mid- level of calibration curve	X			
Calibration Blanks	X			
1) Analyzed prior to initial calibration standards and after each CCS/QCS?	X			
2) Absolute value should not exceed MDL.	X			
Method Blank, Field Blanks and/or Equipment Blanks Included in Lab Package?	X			
1) Method blank analyzed with each preparation batch?	X			
2) Absolute value should not exceed MDL.	X			
Eh and pH Data	X			
1) Eh and pH data was included and plotted for all samples?	X			
Soluble Matrix Spike Data Included in Lab Package?	X			JC37110-4,-4R
1) Soluble Matrix %R criteria met? (75-125%R).		X		See table.
2) Was the spike concentration 40 mg/Kg or twice the sample concentration?	X			Spiked at 46.7 and 47.6 mg/kg.
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	X			
Insoluble Matrix Spike Data Included in Lab Package?	X			JC37110-4,-4R
1) Insoluble Matrix %R criteria met? (75-125%R).	X			
2) Was the spike concentration around 400 to 800 mg/Kg?		X		Spiked at 1350 and 1290 mg/kg. No impact on data.
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	X			

ITEM	YES	NO	N/A	COMMENTS
Post Digestion Spike	X			JC37110-4,-4R
1) Post Digestion Spike %R criteria met? (85-115%R).	X			
2) Was the spike concentration 40 mg/Kg or twice the sample concentration?	X			
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	X			
Sample Duplicate Data Included in Lab Package?	X			JC37110-4, -4R
1) RPD criteria met? (RPD <20%) if both results are >4x RL or absolute difference <RL if either or both results are <4xRL.		X		Reanalysis did not meet RPD. See table.
2) Was a sample duplicate analyzed at the frequency of 1 per batch or 20 samples?	X			
Was a Laboratory Control Sample (LCS) Included in Lab Package?	X			
1) %R criteria met? (80-120%R).	X			
2) Was an LCS analyzed at the frequency of 1/batch or 20 samples?	X			
Were any Field Duplicate samples submitted with this SDG?	X			JC37110-2/3
1) RPD criteria met? (RPD <20%) if both results are >4x RL or absolute difference <RL if either or both results are <4xRL	X			See table.
Were all sample quantitation and reporting requirements met?	X			
1) Were all solid samples reported with percent solids > 50%?	X			
2) Were any samples analyzed or reported with dilutions?	X			Up to 5X dilution on JC37110-4
Miscellaneous Items	X			
1) For soils by 7196A, was the pH within a range of 7.0-8.0?	X			
2) For soils by 7199, was the pH within a range of 9.0-9.5?			X	
3) For aqueous by 7196A, was the pH with a range of 1.5-2.5?	X			
4) For soils (3060A), was the digestion temperature 90-95C for at least 60 minutes?	X			
5) For 7199, was each sample injected twice and was the RPD ≤20?			X	

Matrix Spikes

Sample ID	Lab ID	Analyte	Matrix Spike	% Recovery	Lower Limit	Upper Limit	PDS %	PDS Limit	Action
NFS-PDI-DD11BR-12.0-12.5	JC37110-4	CHROMIUM (HEXAVALENT)	Insoluble	94.7	75	125	106	85-115	Estimate (J/UJ)
NFS-PDI-DD11BR-12.0-12.5	JC37110-4	CHROMIUM (HEXAVALENT)	Soluble	65.3	75	125			
NFS-PDI-DD11BR-12.0-12.5	JC37110-4R	CHROMIUM (HEXAVALENT)	Soluble	205.7	75	125	94	85-115	
NFS-PDI-DD11BR-12.0-12.5	JC37110-4R	CHROMIUM (HEXAVALENT)	Insoluble	91.5	75	125			

Lab Duplicates

Sample ID	Lab ID	Analyte	Sample Result	Qual	Duplicate Result	Qual	QL	Units	RPD	Action
NFS-PDI-DD11BR-12.0-12.5	JC37110-4	CHROMIUM (HEXAVALENT)	70.5		67.7		2.4	mg/kg	4.1	OK
NFS-PDI-DD11BR-12.0-12.5	JC37110-4R	CHROMIUM (HEXAVALENT)	21.1		52.6		0.97	mg/kg	85.5	SR>4xRL, Estimate (J/UJ)

Field Duplicates

Sample ID	Duplicate ID	Analyte	Sample Result	Qual	Duplicate Result	Qual	QL	Units	RPD	Action
NFS-PDI-DD11BR-10.0-10.5	NFS-PDI-DD11BR-10.0-10.5X	CHROMIUM (HEXAVALENT)	7.5		6.4		0.47	mg/kg	15.8	OK

Percent Solids

Sample ID	Percent Solids (%)	Status
NFS-PDI-DD11BR-10.0-10.5	85.9	ok @50%
NFS-PDI-DD11BR-10.0-10.5X	86	ok @50%
NFS-PDI-DD11BR-12.0-12.5	82.4	ok @50%
NFS-PDI-DD11BR-14.0-14.5	82.1	ok @50%
NFS-PDI-DD11BR-16.0-16.5	80.4	ok @50%
NFS-PDI-DD11BR-18.0-18.5	80.4	ok @50%
NFS-PDI-DD11BR-2.5-3.0	78.7	ok @50%
NFS-PDI-DD11BR-20.0-20.5	79.4	ok @50%
NFS-PDI-DD11BR-4.0-4.5	82.6	ok @50%
NFS-PDI-DD11BR-5.5-6.0	84.9	ok @50%
NFS-PDI-DD11BR-6.0-6.5	86.1	ok @50%
NFS-PDI-DD11BR-8.0-8.5	81.1	ok @50%

SDG#: JC37110/ Method 7196

Batch: GN59491

Cr+6 ICAL 2/16/17

Soil

(p. 57 of data pkg)

x - concentration	y - response
0	0
0.01	0.01
0.05	0.043
0.1	0.086
0.3	0.252
0.5	0.409
0.8	0.651
1	0.835

(p. 57 of data pkg)

AECOM Calculated Offset	0.0012	OK	Reported Offset	0.0012
AECOM Slope	0.8248	OK	Reported Slope	0.8248
AECOM Calculated r	0.99984	OK	Reported r	0.99984

LCS calculation

GP3285-B1

P. 38,57

Background Absorbance

0

Total absorbance

0.72

Total absorbance - background

0.72

Instrument Concentration

0.872

Sample weight (mg/kg)

0.0025

Final Volume (L)

0.1

Dilution Factor

1

AECOM Calculated LCS Result (mg/Kg)	34.9	OK	Reported Result (mg/Kg)	34.9
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%R = Found/True*100

GP3285-B1

P. 38,57

True Value (mg/kg)

40

AECOM Calculated %R	87.2	OK, rounding	Reported %R	87.3
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MS calculation

GP3285-S2

P. 40,41,57

JC37110-4

Background reading

0

Total absorbance

0.454

Total absorbance - background

0.454

Instrument Concentration

0.5490

Sample weight (mg/kg)

0.00247

Final Volume (L)

0.1

Percent solids

0.824

Dilution Factor

50

AECOM Calculated MS Result (mg/Kg)	1349	OK, rounding	Reported Result (mg/Kg)	1350.0
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%R = Found/True*100

GP3285-S2

P. 40,41,57

JC37110-4

True Value (mg/kg)

1350

Native concentration (mg/Kg)

70.5

AECOM %R	94.7	OK	Reported %R	94.7
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Percent Solids

JC37110-4

P. 41

NFS-PDI-DD11BR-12.0-12.5

Empty dish weight=

24.51

Wet weight= 31.23

Dry weight= 30.05

AECOM %solids =	82.4	OK	Reported %solids=	82.4
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Reporting Limit	JC37110-4	P. 13,41,57	NFS-PDI-DD11BR-12.0-12.5
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Low Standard 0.01

Initial weight (mg/kg) 0.00244

Final volume (L) 0.1

Percent solids 0.824

Dilution Factor 5

Reporting Limit	2.5	OK, rounding	Reported RL (mg/Kg)=	2.4
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Sample Calculations	JC37110-4	P. 13,41,57	NFS-PDI-DD11BR-12.0-12.5
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Background reading 0

Total absorbance 0.235

Total absorbance - background 0.235

Instrument Response 0.283

Sample weight (mg/kg) 0.00244

Final Volume (L) 0.1

Percent solids 0.824

Dilution Factor 5

AECOM Calculated Result (mg/Kg)	70.5	OK	Reported Result (mg/Kg)	70.5
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SDG#: JC37110R/ Method 7196

Batch: GN59771

Cr+6 ICAL 2/16/17

Soil

(p. 81 of data pkg)

x - concentration	y - response
0	0
0.01	0.01
0.05	0.044
0.1	0.085
0.3	0.24
0.5	0.418
0.8	0.661
1	0.817

(p. 81 of data pkg)

AECOM Calculated Offset	0.0016	OK	Reported Offset	0.0016
AECOM Slope	0.8196	OK	Reported Slope	0.8196
AECOM Calculated r	0.99990	OK	Reported r	0.99990

LCS calculation

GP3373-B1

P. 35,81

Background Absorbance	0
Total absorbance	0.778
Total absorbance - background	0.778
Instrument Concentration	0.947
Sample weight (mg/kg)	0.0025
Final Volume (L)	0.1
Dilution Factor	1

AECOM Calculated LCS Result (mg/Kg)	37.9	OK	Reported Result (mg/Kg)	37.9
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%R = Found/True*100

GP3373-B1

P. 35,81

True Value (mg/kg)	40
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AECOM Calculated %R	94.7	OK, rounding	Reported %R	94.8
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MS calculation

GP3373-S2

P. 37,43,81

JC37110-4R

Background reading	0
Total absorbance	0.412
Total absorbance - background	0.412
Instrument Concentration	0.5007
Sample weight (mg/kg)	0.00253
Final Volume (L)	0.1
Percent solids	0.824
Dilution Factor	50

AECOM Calculated MS Result (mg/Kg)	1201	OK, rounding	Reported Result (mg/Kg)	1200
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%R = Found/True*100

GP3373-S2

P. 37,43,81

JC37110-4R

True Value (mg/kg)	1290
Native concentration (mg/Kg)	21.1

AECOM %R	91.5	OK	Reported %R	91.5
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Percent Solids

JC37110-4R

P. 43

NFS-PDI-DD11BR-12.0-12.5

Empty dish weight=	24.51
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Wet weight= 31.23

Dry weight= 30.05

AECOM %solids =	82.4	OK	Reported %solids=	82.4
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Reporting Limit

JC37110-4R

P. 11,43,81

NFS-PDI-DD11BR-12.0-
12.5

Low Standard 0.01

Initial weight (mg/kg) 0.00259

Final volume (L) 0.1

Percent solids 0.824

Dilution Factor 2

Reporting Limit	0.94	OK, rounding	Reported RL (mg/Kg)=	0.97
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Sample Calculations

JC37110-4R

P. 11,43,81

NFS-PDI-DD11BR-12.0-
12.5

Background reading 0

Total absorbance 0.186

Total absorbance - background 0.186

Instrument Response 0.225

Sample weight (mg/kg) 0.00259

Final Volume (L) 0.1

Percent solids 0.824

Dilution Factor 2

AECOM Calculated Result (mg/Kg)	21.1	OK	Reported Result (mg/Kg)	21.1
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Data Validation Report

Project:	North Forrest Street Supplemental PDI Sampling		
Laboratory:	Accutest, Dayton, NJ		
Laboratory Job No.:	JC37176		
Analysis/Method:	Hexavalent Chromium SW846 3060A/7196A		
Validation Level:	Full		
Site Location/Address:	70 Carteret Avenue, Jersey City, NJ		
AECOM Project No:	60314351.GA.DE.PDI.NFS		
Prepared by:	Charlene Livingston Flint /AECOM	Completed on:	02/21/2017
Reviewed by:	Sharon McKechnie /AECOM	File Name:	JC37176_2017-02-21_DVReport-F

Introduction

The data were reviewed in accordance with the FSP-QAPP and the following NJDEP validation Standard Operating Procedure (SOP):

- NJDEP Office of Data Quality SOP 5.A.10, Rev 3 (September 2009), SOP for Analytical Data Validation of Hexavalent Chromium - for USEPA SW-846 Method 3060A, USEPA SW-846 Method 7196A.

The results of quality control data analyzed with site samples were used to assess the overall reliability of the data. The following qualifiers were used to identify data quality issues:

- U: Indicates the analyte was not detected in the sample above the sample reporting limit.
- J: Indicates the result was an estimated value; the associated numerical value was an approximate concentration of the analyte in the sample.
- UJ: Indicates the analyte was not detected above the reporting limit and the reporting limit was approximate.
- UB: The analyte concentration is less than or equal to three (3) times the concentration in the associated method/prep blank. The presence of the analyte in the sample is negated (UB) due to laboratory contamination.
- JB: The analyte concentration is greater than three (3) times, but less than or equal to ten (10) times the concentration in the associated method/prep blank. The presence of that analyte in the sample is considered "real". The concentration is quantitatively qualified (JB) due to method blank contamination.
- R: The sample result was rejected due to serious deficiencies; the presence or absence of the analyte could not be confirmed.
- RA: The sample result was rejected but is still considered usable.

Sample Information

The samples listed below were collected by AECOM on February 14, 2017 as part of the North Forrest Street Supplemental PDI Sampling at 70 Carteret Avenue, Jersey City, New Jersey. Only the samples and parameters listed below were validated.

Field ID	Laboratory ID	Matrix	Fraction
NFS-FB20170214 (Equipment Blank)	JC37176-1	Aqueous	Hexavalent Chromium
NFS-PDI-CC14BR-10.0-10.5	JC37176-2	Soil	Hexavalent Chromium
NFS-PDI-CC14BR-12.0-12.5	JC37176-3	Soil	Hexavalent Chromium
NFS-PDI-CC14BR-13.5-14.0	JC37176-15	Soil	Hexavalent Chromium
NFS-PDI-CC14BR-2.0-2.5	JC37176-4	Soil	Hexavalent Chromium
NFS-PDI-CC14BR-4.0-4.5	JC37176-5	Soil	Hexavalent Chromium
NFS-PDI-CC14BR-6.0-6.5	JC37176-6	Soil	Hexavalent Chromium
NFS-PDI-CC14BR-8.0-8.5	JC37176-7	Soil	Hexavalent Chromium
NFS-PDI-DD14B-11.0-11.5	JC37176-8	Soil	Hexavalent Chromium
NFS-PDI-DD14B-13.0-13.5	JC37176-9	Soil	Hexavalent Chromium
NFS-PDI-DD14B-3.0-3.5	JC37176-10	Soil	Hexavalent Chromium
NFS-PDI-DD14B-5.0-5.5	JC37176-11	Soil	Hexavalent Chromium
NFS-PDI-DD14B-7.0-7.5	JC37176-12	Soil	Hexavalent Chromium
NFS-PDI-DD14B-7.0-7.5X (Field Duplicate of NFS-PDI-DD14B-7.0-7.5)	JC37176-13	Soil	Hexavalent Chromium
NFS-PDI-DD14B-9.0-9.5	JC37176-14	Soil	Hexavalent Chromium

The samples were collected following the procedures detailed in the Work Order for Garfield Avenue Remedial Action (GARA) at 70 Carteret Avenue, Jersey City, NJ and the Field Sampling Plan/Quality Assurance Project Plan for Non-Residential and Residential Chromium Sites Hudson County, New Jersey (December 2011).

General Comments

The data package was complete. Quality control (QC) issues identified during validation are discussed below. Refer to the Target Analyte Summary Hit List(s) in Attachment A for a listing of all detected results, qualified results, and associated qualifications, where applicable. The nonconformances for each section discussed below are presented in Attachment B.

Laboratory Blanks/Equipment Blanks

Negative drift for hexavalent chromium was detected in the aqueous continuing calibration blanks (CCB) impacting the aqueous method blank and the equipment blank, NFS-FB20170214. The nondetect equipment blank result was qualified as estimated (UJ).

MS Results

Sample NFS-PDI-DD14B-13.0-13.5 (JC37176-9) was selected for the matrix spike (MS) analysis associated with the samples in this SDG and was used for supporting data quality recommendations. The soluble and insoluble MS recoveries were 93.3% and 94.1%, respectively; which met the quality control criteria of 75-125%. The post digestion spike (PDS) recovery was

105%, which met the PDS criteria of 85-115%. No data qualification was required on the basis of spike recoveries.

Sample Results

Reported results (flagged B by the laboratory) that were less than the reporting limit (RL), but greater than or equal to the method detection limit (MDL) are approximate values and have been qualified as estimated (J).

Data Quality and Usability

In general, these data appear to be valid and may be used for decision-making purposes. No data were rejected. Qualified and detected results are presented in Attachments A and B.

The nondetect result for the equipment blank, NFS-FB20170214, was qualified as estimated (UJ) due to negative instrument drift.

Sample results reported between the MDL and RL are usable as estimated values with an unknown directional bias.

ATTACHMENTS

Attachment A: Target Analyte Summary Hit List(s)

Attachment B: Data Validation Report Form

Attachment A

Target Analyte Summary Hit List(s)

Soil Target Analyte Summary Hit List (Hexavalent Chromium)

Site Name North Forrest Street Supplemental PDI Sampling
Sampling Date February 14, 2017
Lab Name/ID Accutest, Dayton, NJ
SDG No JC37176
Sample Matrix Soil
Trip Blank ID NA
Field Blank ID NFS-FB20170214

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
NFS-PDI-CC14BR-10.0-10.5	JC37176-2	CHROMIUM (HEXAVALENT)	U	1.8	1.8	0.48		
NFS-PDI-CC14BR-12.0-12.5	JC37176-3	CHROMIUM (HEXAVALENT)	U	0.37B	0.37	0.47	Qualify	1
NFS-PDI-CC14BR-2.0-2.5	JC37176-4	CHROMIUM (HEXAVALENT)	U	5.0	5.0	0.49		
NFS-PDI-CC14BR-4.0-4.5	JC37176-5	CHROMIUM (HEXAVALENT)	U	4.6	4.6	0.48		
NFS-PDI-CC14BR-6.0-6.5	JC37176-6	CHROMIUM (HEXAVALENT)	U	4.5	4.5	0.47		
NFS-PDI-CC14BR-8.0-8.5	JC37176-7	CHROMIUM (HEXAVALENT)	U	2.1	2.1	0.48		
NFS-PDI-DD14B-5.0-5.5	JC37176-11	CHROMIUM (HEXAVALENT)	U	2.2	2.2	0.49		

Note: A "U" under Method Blank column indicates a nondetect result.

NJDEP Laboratory Footnote

1. The reported result was greater than the MDL but less than the RL and qualified as estimated.

Aqueous Target Analyte Summary Hit List (Hexavalent Chromium)

Site Name North Forrest Street Supplemental PDI Sampling
Sampling Date February 14, 2017
Lab Name/ID Accutest, Dayton, NJ
SDG No JC37176
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID NFS-FB20170214

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
NFS-FB20170214	JC37176-1	CHROMIUM (HEXAVALENT)	U	U	UJ	0.010	Qualify	1

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

NJDEP Laboratory Footnote

1. The reported result was qualified as estimated due to negative instrument drift.

Attachment B

Data Validation Report Form

Client Name: PPG Industries		Project Number: 60314351.GA.DE.PDI.NFS			
Site Location: North Forrest Street Supplemental PDI Sampling, Jersey City, NJ		Project Manager: Scott Mikaelian			
Laboratory: Accutest, Dayton, NJ		Type of Validation: Full			
Laboratory Job No: JC37176		Date Checked: 02/21/2017			
Validator: Charlene Livingston Flint		Peer: Sharon McKechnie			
ITEM	YES	NO	N/A	COMMENTS	
Sample results included?	X				
Reporting Limits met project requirements?	X				
Field I.D. included?	X				
Laboratory I.D. included?	X				
Did data package sample IDs match sample IDs on COC?	X				
Did electronic data deliverable (EDD) sample IDs match COC sample IDs?	X				
Did data package sample IDs match electronic data deliverable (EDD) sample IDs?	X				
Sample matrix included?	X				
Sample receipt temperature 2-6°C?	X			4.7 °C	
Signed COCs included?	X				
Date of sample collection included?	X				
Date of sample digestion included?	X				
Holding time to digestion met criteria? (Soils -30 days from collection to digestion.)	X				
Date of analysis included?	X				
Holding time to analysis met criteria? (Soils -168 hours from digestion to analysis; Aqueous - 24 hours from collection to analysis.)	X				
Method reference included?	X				
Laboratory Case Narrative included?	X				
Definitions: MDL - Method Detection Limit; %R - Percent Recovery; RL - Reporting Limit; RPD - Relative Percent Difference; RSD - Relative Standard Deviation ;Corr - Correlation Coefficient.					

ITEM	YES	NO	N/A	COMMENTS
Initial calibration documentation included in lab package?	X			
1) Blank plus 4 standards (7196A) or blank plus 3 standards (7199)	X			
2) Correlation coefficient of =0.995 (7196A) or =0.999 (7199)	X			
3) Calibrate daily or each time instrument is set up.	X			
Calibration Check Standard (CCS) for 7196A and Quality Control Sample (QCS) for 7199 Included in Lab Package?	X			
1) %R criteria met? (90 - 110%)	X			
2) Correct frequency of one per every 10 samples	X			
3) CCS and QCS from independent source and at mid- level of calibration curve	X			
Calibration Blanks	X			
1) Analyzed prior to initial calibration standards and after each CCS/QCS?	X			
2) Absolute value should not exceed MDL.		X		Aq CCB > abs value of MDL. Neg drift. Estimate (UJ)
Method Blank, Field Blanks and/or Equipment Blanks Included in Lab Package?	X			
1) Method blank analyzed with each preparation batch?	X			
2) Absolute value should not exceed MDL.	X			
Eh and pH Data	X			
1) Eh and pH data was included and plotted for all samples?	X			
Soluble Matrix Spike Data Included in Lab Package?	X			JC37176-9
1) Soluble Matrix %R criteria met? (75-125%R).	X			
2) Was the spike concentration 40 mg/Kg or twice the sample concentration?	X			Spiked at 44.6 mg/kg.
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	X			
Insoluble Matrix Spike Data Included in Lab Package?	X			
1) Insoluble Matrix %R criteria met? (75-125%R).	X			
2) Was the spike concentration around 400 to 800 mg/Kg?		X		Spiked at 932 mg/kg. No impact on data.
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	X			
Post Digestion Spike	X			

1) Post Digestion Spike %R criteria met? (85-115%R).	X			
2) Was the spike concentration 40 mg/Kg or twice the sample concentration?	X			
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	X			
Sample Duplicate Data Included in Lab Package?	X			JC37176-9
1) RPD criteria met? (RPD <20%) if both results are >4x RL or absolute difference <RL if either or both results are <4xRL..	X			
2) Was a sample duplicate analyzed at the frequency of 1 per batch or 20 samples?	X			
Was a Laboratory Control Sample (LCS) Included in Lab Package?	X			
1) %R criteria met? (80-120%R).	X			
2) Was an LCS analyzed at the frequency of 1/batch or 20 samples?	X			
Were any Field Duplicate samples submitted with this SDG?	X			JC37176-12 & JC37176-13
1) RPD criteria met? (RPD <20%) if both results are >4x RL or absolute difference <RL if either or both results are <4xRL	X			Both ND
Were all sample quantitation and reporting requirements met?	X			
1) Were all solid samples reported with percent solids > 50%?	X			
2) Were any samples analyzed or reported with dilutions?		X		
Miscellaneous Items	X			
1) For soils by 7196A, was the pH within a range of 7.0-8.0?	X			
2) For soils by 7199, was the pH within a range of 9.0-9.5?			X	
3) For aqueous by 7196A, was the pH with a range of 1.5-2.5?	X			
4) For soils (3060A), was the digestion temperature 90-95C for at least 60 minutes?	X			
5) For 7199, was each sample injected twice and was the RPD ≤20?			X	
Hexavalent chromium result <chromium result?			X	

CCB

CCB ID	CCB Concentration	MDL	Units	Associated Sample
All CCBs for 2/14/17	-0.0042	0.0039	mg/l	NFS-FB20170214

Matrix Spikes

Sample ID	Lab ID	Analyte	Matrix Spike	% Recovery	Lower Limit	Upper Limit	PDS %	PDS Limit
NFS-PDI-DD14B-13.0-13.5	JC37176-9	CHROMIUM (HEXAVALENT)	Insoluble	94.1	75	125	105	85-115
NFS-PDI-DD14B-13.0-13.5	JC37176-9	CHROMIUM (HEXAVALENT)	Soluble	93.3	75	125		

Percent Solids

Sample ID	Percent Solids (%)	Status
NFS-PDI-CC14BR-10.0-10.5	82.9	ok @50%
NFS-PDI-CC14BR-12.0-12.5	85.9	ok @50%
NFS-PDI-CC14BR-13.5-14.0	78.8	ok @50%
NFS-PDI-CC14BR-2.0-2.5	80.9	ok @50%
NFS-PDI-CC14BR-4.0-4.5	83.8	ok @50%
NFS-PDI-CC14BR-6.0-6.5	84.4	ok @50%
NFS-PDI-CC14BR-8.0-8.5	83.6	ok @50%
NFS-PDI-DD14B-11.0-11.5	83.6	ok @50%
NFS-PDI-DD14B-13.0-13.5	88.3	ok @50%
NFS-PDI-DD14B-3.0-3.5	83.2	ok @50%
NFS-PDI-DD14B-5.0-5.5	82.4	ok @50%
NFS-PDI-DD14B-7.0-7.5	84.7	ok @50%
NFS-PDI-DD14B-7.0-7.5X	83.9	ok @50%
NFS-PDI-DD14B-9.0-9.5	83.2	ok @50%

SDG#: JC37176/ Method 7196

Batch: GN59536

Cr+6 ICAL 2/17/17

Soil

(p. 57 of data pkg)

x - concentration	y - response
0	0.001
0.01	0.01
0.05	0.044
0.1	0.084
0.3	0.246
0.5	0.414
0.8	0.652
1	0.805

(p. 57 of data pkg)

AECOM Calculated Offset	0.0035	OK	Reported Offset	0.0035
AECOM Slope	0.8072	OK	Reported Slope	0.8072
AECOM Calculated r	0.99993	OK	Reported r	0.99993

LCS calculation

GP3317-B1

P. 38,57

Background Absorbance	0.002
Total absorbance	0.755
Total absorbance - background	0.753
Instrument Concentration	0.929
Sample weight (mg/kg)	0.0025
Final Volume (L)	0.1
Dilution Factor	1

AECOM Calculated LCS Result (mg/Kg)	37.1	OK	Reported Result (mg/Kg)	37.1
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%R = Found/True*100

GP3317-B1

P. 38,57

True Value (mg/kg)	40
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AECOM Calculated %R	92.9	OK, rounding	Reported %R	92.8
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MS calculation

GP3317-S1

P. 40,42,57

JC37176-9

Background reading	0
Total absorbance	0.757
Total absorbance - background	0.757
Instrument Concentration	0.9335
Sample weight (mg/kg)	0.00254
Final Volume (L)	0.1
Percent solids	0.883
Dilution Factor	1

AECOM Calculated MS Result (mg/Kg)	41.6	OK	Reported Result (mg/Kg)	41.6
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%R = Found/True*100

GP3317-S1

P. 40,42,57

JC37176-9

True Value (mg/kg)	44.6
Native concentration (mg/Kg)	0

AECOM%R	93.3	OK	Reported %R	93.3
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Percent Solids

JC37176-9

P. 42

NFS-PDI-DD14B-13.0-13.5

Empty dish weight=	29.52
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Wet weight= 36.03
 Dry weight= 35.27

AECOM %solids =	88.3	OK	Reported %solids=	88.3
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Reporting Limit	JC37176-9	P. 18,42,57	NFS-PDI-DD14B-13.0-13.5
Low Standard	0.01		
Initial weight (mg/kg)	0.00256		
Final volume (L)	0.1		
Percent solids	0.883		
Dilution Factor	1		

Reporting Limit	0.44	OK, rounding	Reported RL (mg/Kg)=	0.45
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Sample Calculations	JC37176-9	P. 18,42,57	NFS-PDI-DD14B-13.0-13.5
Background reading	0		
Total absorbance	0.008		
Total absorbance - background	0.008		
Instrument Response	0.006		
Sample weight (mg/kg)	0.00256		
Final Volume (L)	0.1		
Percent solids	0.883		
Dilution Factor	1		

AECOM Calculated Result (mg/Kg)	0.25	OK, Reported as Nondetect	Reported Result (mg/Kg)	0.32 U
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Data Validation Report

Project:	PPG - North Forrest Street Sampling	
Laboratory:	SGS/Accutest, Dayton, NJ	
Laboratory Job No.:	JC49831 and JC49831R	
Analysis/Method:	Hexavalent Chromium SW846 3060A/7196A	
Validation Level:	Full (Hexavalent Chromium)	
Site Location/Address:	70 Carteret Avenue, Jersey City, NJ	
AECOM Project No:	60540263 GA.RA.COS.2017	
Prepared by:	Sharon McKechnie /AECOM	Completed on: 09/25/2017
Reviewed by:	Mary Kozik/AECOM	File Name: JC49831_R_2017-05-05_DVR-F

Introduction

The data were reviewed in accordance with the FSP-QAPP and the following NJDEP validation Standard Operating Procedure(s) (SOP):

- NJDEP Office of Data Quality SOP 5.A.10, Rev 3 (September 2009), SOP for Analytical Data Validation of Hexavalent Chromium - for USEPA SW-846 Method 3060A, USEPA SW-846 Method 7196A.

The results of quality control data analyzed with site samples were used to assess the overall reliability of the data. The following qualifiers were used to identify data quality issues:

- U: Indicates the analyte was not detected in the sample above the sample reporting limit.
- J: Indicates the result was an estimated value; the associated numerical value was an approximate concentration of the analyte in the sample.
- J+: Indicates the analyte was positively identified; the associated numerical value is an estimated quantity with a potential high bias.
- J-: Indicates the analyte was positively identified; the associated numerical value is an estimated quantity with a potential low bias.
- UJ: Indicates the analyte was not detected above the reporting limit and the reporting limit was approximate.
- UB: The analyte concentration is less than or equal to three (3) times the concentration in the associated method/prep blank. The presence of the analyte in the sample is negated (UB) due to laboratory contamination.

JB: The analyte concentration is greater than three (3) times, but less than or equal to ten (10) times the concentration in the associated method/prep blank. The presence of that analyte in the sample is considered "real". The concentration is quantitatively qualified (JB) due to method blank contamination.

R: The sample result was rejected due to serious deficiencies; the presence or absence of the analyte could not be confirmed.

RA: The sample result was rejected but is still considered usable.

Sample Information

The samples listed below were collected by AECOM on August 30, 2017 as part of the PPG - North Forrest Street sampling at 70 Carteret Avenue, Jersey City, New Jersey. Only the samples and parameters listed below were validated.

Field ID	Laboratory ID	Matrix	Fraction
NFS-FB20170830 (Equipment Blank)	JC49831-1	Aqueous	Hexavalent Chromium
NFS-PDI-GG15B-1.7-2.2	JC49831-7,7R	Soil	Hexavalent Chromium
NFS-PDI-GG15B-2.2-2.7	JC49831-8,8R	Soil	Hexavalent Chromium
NFS-PDI-GG15B-2.7-3.2	JC49831-9,9R	Soil	Hexavalent Chromium
NFS-PDI-GG15B-3.2-3.7	JC49831-10,10R	Soil	Hexavalent Chromium
NFS-PDI-GG15B-3.2-3.7X (Field Duplicate)	JC49831-11	Soil	Hexavalent Chromium
NFS-PDI-GG15B-3.2-3.7X (Field Duplicate of NFS-PDI-GG15B-3.2-3.7)	JC49831-11R	Soil	Hexavalent Chromium
NFS-PDI-GG16B-2.1-2.6	JC49831-2,2R	Soil	Hexavalent Chromium
NFS-PDI-GG16B-2.6-3.1	JC49831-3,3R	Soil	Hexavalent Chromium
NFS-PDI-GG16B-3.1-3.6	JC49831-4,4R	Soil	Hexavalent Chromium
NFS-PDI-GG16B-3.6-4.1	JC49831-5,5R	Soil	Hexavalent Chromium

The samples were collected following the procedures detailed in the Work Order for PPG - North Forrest Street Properties sampling at 70 Carteret Avenue, Jersey City, New Jersey and the Field Sampling Plan/Quality Assurance Project Plan for Non-Residential and Residential Chromium Sites Hudson County, New Jersey (December 2011).

General Comments

The data package was complete except as noted below:

- Data was reported for sample NFS-PDI-GG15B-3.2-3.7X; however, this sample was not listed on the COC. No action was taken other than this note.

Quality control (QC) issues identified during validation are discussed below. Refer to the Soil Target Analyte Summary Hit List(s) in Attachment A for a listing of all detected results, qualified results, and associated qualifications, where applicable. The nonconformances for each section discussed below are presented in Attachment B.

Matrix Spike Results

Sample NFS-PDI-GG15B-3.2-3.7 was selected for the soil matrix spike (MS) analysis and used for supporting data quality recommendations. The soluble and insoluble MS recoveries from the initial batch were 67.8% and 102.5%, respectively. The soluble MS recovery did not meet the quality control (QC) criteria of 75-125%R. The post digestion spike (PDS) recovery was 79.8%, which did not meet the PDS criteria of 85-115%. After pH adjustment the PDS recovery was 91.2%.

Based on the low soluble MS recovery, the MS and associated samples were reanalyzed using Method 7196A. The soluble and insoluble MS recoveries from the re-analysis were 69.9% and 100.7%, respectively. The soluble MS recovery did not meet the QC criteria of 75-125%R. The PDS recovery was 85.2%, which met the PDS criteria of 85-115%.

Since the soluble MS recoveries were outside the acceptable QC limit of 75-125%, additional parameters were analyzed to determine if possible matrix interferences could be the cause for the low MS recoveries. All the soil samples were tested for pH and oxidation reduction potential (ORP) and plotted on an Eh/pH phase diagram. From this diagram, the source sample for the MS analysis was plotted below the phase change line, indicating a reducing potential within the sample matrix incapable of supporting hexavalent chromium. Analyses for ferrous iron, sulfide screen, and total organic carbon (TOC) were performed on the MS source sample to confirm the oxidizing/reducing potential within the sample matrix. The sulfide screen was reported as nondetect, indicating no reducing agents within the sample matrix; however, the ferrous iron (1.3 %) and the TOC results (29,500 mg/Kg) were positive, indicating potential reducing agents within the sample matrix.

Since the soluble MS recoveries from both the initial and reanalysis did not meet the MS QC requirements, but at least one MS recovery was greater than 50%, all soil hexavalent chromium results were qualified as estimated (J-) and may have a low bias due to low MS recoveries. For all soil samples, the highest detected hexavalent chromium result between the initial and reanalysis was reported.

No further qualification was taken based on the low initial PDS recovery since the reanalysis PDS %R was acceptable.

Laboratory Duplicate Precision

Sample NFS-PDI-GG15B-3.2-3.7 was selected by the laboratory to demonstrate laboratory precision capabilities. The reanalysis relative percent difference criteria were exceeded. Therefore, all results reported from the reanalysis batch were qualified as estimated (J) with an indeterminate bias. The initial analysis precision was acceptable.

Field Duplicate Results

The relative percent difference (RPD) for field duplicate (FD) pair NFS-PDI-GG15B-3.2-3.7 and NFS-PDI-GG15B-3.2-3.7X exceeded the QC criteria. Therefore, all soil results were qualified as estimated (J) with an indeterminate bias.

Data Quality and Usability

In general, these data appear to be valid and may be used for decision-making purposes, no data were rejected. Qualified and detected results are presented in Attachments A and B.

The hexavalent chromium soil results for all samples were qualified as estimated (J-) with a low bias for low MS recovery. Since all soil samples were also qualified as estimated (J) for field duplicate precision, which carries no bias, all hexavalent chromium results were qualified as estimated (J) with

a net indeterminate bias. The highest detected hexavalent chromium result between the initial and reanalysis was reported.

All soil hexavalent chromium results reported from the reanalysis were qualified as estimated due to laboratory duplicate precision.

ATTACHMENTS

Attachment A: Target Analyte Summary Hit List(s)

Attachment B: Data Validation Report Form

Attachment A

Target Analyte Summary Hit List(s)

Soil Target Analyte Summary Hit List (Hexavalent Chromium)

Site Name PPG - North Forrest Street Sampling
Sampling Date August 30, 2017
Lab Name/ID SGS/Accutest, Dayton, NJ
SDG No JC49831_R
Sample Matrix Soil
Trip Blank ID NA
Field Blank ID NFS-FB20170830

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
NFS-PDI-GG15B-1.7-2.2	JC49831-7	CHROMIUM (HEXAVALENT)	U	21.3	21.3J	0.48	Qualify	1,3
NFS-PDI-GG15B-2.2-2.7	JC49831-8	CHROMIUM (HEXAVALENT)	U	7.6	7.6J	0.46	Qualify	1,3
NFS-PDI-GG15B-2.7-3.2	JC49831-9	CHROMIUM (HEXAVALENT)	U	6.9	6.9J	0.47	Qualify	1,3
NFS-PDI-GG15B-3.2-3.7	JC49831-10	CHROMIUM (HEXAVALENT)	U	6.3	6.3J	0.52	Qualify	1,3
NFS-PDI-GG15B-3.2-3.7X	JC49831-11R	CHROMIUM (HEXAVALENT)	U	5.0	5.0J	0.50	Qualify	1,2,3
NFS-PDI-GG16B-2.1-2.6	JC49831-2R	CHROMIUM (HEXAVALENT)	U	15.9	15.9J	0.44	Qualify	1,2,3
NFS-PDI-GG16B-2.6-3.1	JC49831-3R	CHROMIUM (HEXAVALENT)	U	9.8	9.8J	0.44	Qualify	1,2,3
NFS-PDI-GG16B-3.1-3.6	JC49831-4R	CHROMIUM (HEXAVALENT)	U	18.0	18.0J	0.45	Qualify	1,2,3
NFS-PDI-GG16B-3.6-4.1	JC49831-5	CHROMIUM (HEXAVALENT)	U	3.5	3.5J	0.51	Qualify	1,3

Note: A "U" under Method Blank column indicates a nondetect result

NJDEP Laboratory Footnote

1. The result was qualified as estimated because the matrix spike recovery was less than 75 %, but greater than 50%.
2. The result was qualified as estimated because the laboratory duplicate did not meet the precision criteria.
3. The result was qualified as estimated because the field duplicate did not meet the precision criteria.

Attachment B

Data Validation Report Form

Client Name: PPG Industries	Project Number: 60540263 GA.RA.COS.2017
Site Location: : PPG - North Forrest Street, Jersey City, NJ	Project Manager: Aimee Ruiter
Laboratory: SGS/Accutest, Dayton, NJ	Type of Validation: Full
Laboratory Job No: JC49831_R	Date Checked: 09/25/17
Validator: Sharon McKechnie	Peer: Mary Kozik

ITEM	YES	NO	N/A	COMMENTS
Sample results included?	X			
Reporting Limits met project requirements?	X			
Field I.D. included?	X			
Laboratory I.D. included?	X			
Did data package sample IDs match sample IDs on COC?	X			
Did electronic data deliverable (EDD) sample IDs match COC sample IDs?	X			
Did data package sample IDs match electronic data deliverable (EDD) sample IDs?	X			
Sample matrix included?	X			
Sample receipt temperature 2-6°C?	X			
Signed COCs included?	X			
Date of sample collection included?	X			
Date of sample digestion included?	X			
Holding time to digestion met criteria? (Soils -30 days from collection to digestion.)	X			
Date of analysis included?	X			
Holding time to analysis met criteria?	X			
Method reference included?	X			
Laboratory Case Narrative included?	X			

Definitions: MDL - Method Detection Limit; %R - Percent Recovery; RL - Reporting Limit; RPD - Relative Percent Difference; RSD - Relative Standard Deviation :Corr - Correlation Coefficient.

ITEM	YES	NO	N/A	COMMENTS
Initial calibration documentation included in lab package?	X			
1) Blank plus 4 standards (7196A) or blank plus 3 standards (7199)	X			
2) Correlation coefficient of >0.995 (7196A) or >0.999 (7199)	X			
3) Calibrate daily or each time instrument is set up.	X			
Calibration Check Standard (CCS) for 7196A and Quality Control Sample (QCS) for 7199 Included in Lab Package?	X			
1) %R criteria met? (90 - 110%)	X			
2) Correct frequency of one per every 10 samples	X			
3) CCS and QCS from independent source and at mid- level of calibration curve	X			
Calibration Blanks	X			
1) Analyzed prior to initial calibration standards and after each CCS/QCS?	X			
2) Absolute value should not exceed MDL.	X			
Method Blank, Field Blanks and/or Equipment Blanks Included in Lab Package?	X			
1) Method blank analyzed with each preparation batch?	X			
2) Absolute value should not exceed MDL.	X			
Eh and pH Data	X			
1) Eh and pH data was included and plotted for all samples?	X			
Soluble Matrix Spike Data Included in Lab Package?	X			JC49831-10
1) Soluble Matrix %R criteria met? (75-125%R).		X		See table
2) Was the spike concentration 40 mg/Kg or twice the sample concentration?		X		Initial and rerun spiked at 50.5 mg/kg and 51.1 mg/kg, respectively. The data was not affected.
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	X			

ITEM	YES	NO	N/A	COMMENTS
Insoluble Matrix Spike Data Included in Lab Package?	X			JC49831-10
1) Insoluble Matrix %R criteria met? (75-125%R).	X			See table
2) Was the spike concentration around 400 to 800 mg/Kg?		X		Initial and rerun spiked at 1570 mg/kg and 1020 mg/kg, respectively. The data was not affected.
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	X			
Post Digestion Spike	X			JC49831-10
1) Post Digestion Spike %R criteria met? (85-115%R).		X		See table
2) Was the spike concentration 40 mg/Kg or twice the sample concentration?	X			
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	X			
Sample Duplicate Data Included in Lab Package?	X			JC49831-10
1) RPD criteria met? (RPD < 20%) if both results are ≥4x RL or control limit of ± RL if both results are <4xRL.		X		See table
2) Was a sample duplicate analyzed at the frequency of 1 per batch or 20 samples?	X			
Was a Laboratory Control Sample (LCS) Included in Lab Package?	X			
1) %R criteria met? (80-120%R).	X			
2) Was an LCS analyzed at the frequency of 1/batch or 20 samples?	X			
Were any Field Duplicate samples submitted with this SDG?	X			
1) RPD criteria met? (RPD < 20%) if both results are ≥4x RL or control limit of ± RL if both results are <4xRL.		X		See Table
Were all sample quantitation and reporting requirements met?	X			
1) Were all solid samples reported with percent solids > 50%?	X			
2) Were any samples analyzed or reported with dilutions?		X		

ITEM	YES	NO	N/A	COMMENTS
Miscellaneous Items	X			
1) For soils by 7196A, was the pH within a range of 7.0-8.0?	X			
2) For soils by 7199, was the pH within a range of 9.0-9.5?			X	
3) For aqueous by 7196A, was the pH with a range of 1.5-2.5?	X			
4) For soils (3060A), was the digestion temperature 90-95C for at least 60 minutes?	X			
5) For 7199, was each sample injected twice and was the RPD \leq 20?			X	

Matrix Spikes

Sample ID	Lab ID	Analyte	Matrix Spike	% Recovery	Lower Limit	Upper Limit	PDS/pH Adj PDS	PDS Limits
NFS-PDI-GG15B-3.2-3.7	JC49831-10	CHROMIUM (HEXAVALENT)	Soluble	67.8	75	125	79.8/91.2	85-115
			Insoluble	102.5				
	JC49831-10R		Soluble	69.9			85.2/NA	
			Insoluble	100.7				

Laboratory Duplicate

Sample ID	Lab ID	Analyte	Sample Result	Duplicate Result	Units	RPD	Action
NFS-PDI-GG15B-3.2-3.7	JC49831-10	CHROMIUM (HEXAVALENT)	6.3	5.3	mg/kg	17.2	Accept
	JC49831-10R		3.9	5.7		37.5	Estimate all in reanalysis batch J

Field Duplicate

Sample ID	Duplicate ID	Analyte	Sample Result	Duplicate Result	Units	RPD	Action
NFS-PDI-GG15B-3.2-3.7	NFS-PDI-GG15B-3.2-3.7X	CHROMIUM (HEXAVALENT)	6.3	3.9	mg/kg	47	Estimate all batches J
NFS-PDI-GG15B-3.2-3.7	NFS-PDI-GG15B-3.2-3.7X	CHROMIUM (HEXAVALENT)	3.6	5.0	mg/kg	33	Estimate all batches J

SDG#: JC49831/ Method 7196
Batch: GN69180
 Cr+6 ICAL 9/8/17
 Soil
 (p. 56 of data pkg)

x - concentration	y - response
0	0.002
0.01	0.009
0.05	0.041
0.1	0.085
0.3	0.239
0.5	0.401
0.8	0.652
1	0.820

(p. 56 of data pkg)

AECOM Calculated Offset	-0.0003	OK	Reported Offset	-0.0003
AECOM Slope	0.8156	OK	Reported Slope	0.8156
AECOM Calculated r	0.99992	OK	Reported r	0.99992

LCS calculation **GP7550-B1** **P.34,56**

Background Absorbance 0
 Total absorbance 0.752
 Total absorbance - background 0.752
 Instrument Concentration 0.922
 Sample weight (mg/kg) 0.0025
 Final Volume (L) 0.1
 Dilution Factor 1

AECOM Calculated LCS Result (mg/Kg)	36.9	OK	Reported Result (mg/Kg)	36.9
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%R = Found/True*100 **GP7550-B1** **P.34,56**

True Value (mg/kg) 40

AECOM Calculated %R	92.2	OK, rounding	Reported %R	92.3
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MS calculation **GP7550-S1** **P.36,56** **JC49831-10**

Background reading 0.01
 Total absorbance 0.665
 Total absorbance - background 0.655
 Instrument Concentration 0.8034
 Sample weight (mg/kg) 0.00256
 Final Volume (L) 0.1
 Percent solids 0.774
 Dilution Factor 1

AECOM Calculated MS Result (mg/Kg)	40.5	OK	Reported Result (mg/Kg)	40.5
------------------------------------	------	----	-------------------------	------

%R = Found/True*100 **GP7550-S1** **P.36,56** **JC49831-10**

True Value (mg/kg) 50.5
 Native concentration (mg/Kg) 6.3

AECOM %R	67.8	OK	Reported %R	67.8
----------	------	----	-------------	------

Percent Solids **JC49831-10** **P. 38** **NFS-PDI-GG15B-3.2-3.7**

Empty dish weight= 19.47
 Wet weight= 27.61
 Dry weight= 25.77

AECOM %solids =	77.4	OK	Reported %solids=	77.4
-----------------	------	----	-------------------	------

Reporting Limit	JC49831-10	P.18,56	NFS-PDI-GG15B-3.2-3.7
Low Standard	0.01		
Initial weight (mg/kg)	0.0025		
Final volume (L)	0.1		
Percent solids	0.774		
Dilution Factor	1		
Reporting Limit	0.52	OK	Reported RL (mg/Kg)= 0.52

Sample Calculations	JC49831-10	P.18,56	NFS-PDI-GG15B-3.2-3.7
Background reading	0.016		
Total absorbance	0.114		
Total absorbance - background	0.098		
Instrument Response	0.120		
Sample weight (mg/kg)	0.00248		
Final Volume (L)	0.1		
Percent solids	0.774		
Dilution Factor	1		
AECOM Calculated Result (mg/Kg)	6.3	OK	Reported Result (mg/Kg) 6.3

Data Validation Report

Project:	Forrest Street Properties		
Laboratory:	SGS North America Inc., Dayton, NJ		
Laboratory Job No.:	JD69726		
Analysis/Method:	Hexavalent Chromium SW846 3060A/7199 Metals (ICP/MS) SW-846 3050B/6010D		
Validation Level:	Full (Hexavalent Chromium) Limited (Chromium)		
Site Location/Address:	70 Carteret Avenue, Jersey City, NJ		
AECOM Project No:	60586453 RD.MISC		
Prepared by:	Charlene Livingston Flint /AECOM	Completed on:	07/31/2023
Reviewed by:	Dani Woitas/AECOM	File Name:	JD69726_2023-07-31_DVReport-F

Introduction

The data were reviewed in accordance with the FSP-QAPP and the following NJDEP validation Standard Operating Procedure (SOP):

- NJDEP Office of Data Quality SOP 5.A.10, Rev 3 (September 2009), SOP for Analytical Data Validation of Hexavalent Chromium - for USEPA SW-846 Method 3060A, USEPA SW-846 Method 7199;
- NJDEP Office of Data Quality SOP 5.A.16, Rev 1 (May 2002), Quality Assurance Data Validation of Analytical Deliverables for Inorganics (based on USEPA SW-846 Methods);

The results of quality control data analyzed with site samples were used to assess the overall reliability of the data. The following qualifiers were used to identify data quality issues:

- U: Indicates the analyte was not detected in the sample above the sample reporting limit.
- J: Indicates the result was an estimated value; the associated numerical value was an approximate concentration of the analyte in the sample.
- J+: Indicates the analyte was positively identified; the associated numerical value is an estimated quantity with a potential high bias.
- J-: Indicates the analyte was positively identified; the associated numerical value is an estimated quantity with a potential low bias.
- UJ: Indicates the analyte was not detected above the reporting limit and the reporting limit was approximate.

- UB: The analyte concentration is less than or equal to three (3) times the concentration in the associated method/prep blank. The presence of the analyte in the sample is negated (UB) due to laboratory contamination.
- JB: The analyte concentration is greater than three (3) times, but less than or equal to ten (10) times the concentration in the associated method/prep blank. The presence of that analyte in the sample is considered "real". The concentration is quantitatively qualified (JB) due to method blank contamination.
- R: The sample result was rejected due to serious deficiencies; the presence or absence of the analyte could not be confirmed.
- RA: The sample result was rejected but is still considered usable.

Sample Information

The sample listed below was collected by AECOM on July 21, 2023 as part of the Forrest Street Properties sampling at 70 Carteret Avenue, Jersey City, New Jersey. Only the sample and parameter listed below were validated.

Field ID	Laboratory ID	Matrix	Fraction
20230721_90FS_BW1	JD69726-1	Soil	Hexavalent Chromium, Chromium
20230721_90FS_CF1	JD69726-2	Soil	Hexavalent Chromium, Chromium
20230721_90FS_FB	JD69726-3	Aqueous	Hexavalent Chromium, Chromium

The sample was collected following the procedures detailed in the Work Order for Forest Street Properties sampling at 70 Carteret Avenue, Jersey City, NJ and the Field Sampling Plan/Quality Assurance Project Plan for Non-Residential and Residential Chromium Sites Hudson County, New Jersey (December 2011).

General Comments

The data package was complete. Quality control (QC) issues identified during validation are discussed below. Refer to the Target Analyte Summary Hit List(s) in Attachment A for a listing of all detected results, qualified results, and associated qualifications, where applicable. The nonconformances for each section discussed below are presented in Attachment B.

Hexavalent Chromium

Sample Results

The results for total chromium and total hexavalent chromium were compared to ensure that the total chromium concentration was greater than the total hexavalent chromium concentration in each sample. Refer to the tables in Attachment B for results and actions. Sample results were evaluated as follows:

Actions: No guidance exists for comparison of total and hexavalent results therefore the following is based on professional judgement and the duplicate criteria in the FSP QAPP.

Total Hexavalent Chromium vs. Dissolved Hexavalent Chromium Chromium vs. Hexavalent Chromium Comparison	Action
Total Chromium Concentration Greater than Hexavalent Chromium Concentration	No Qualification

Total Hexavalent Chromium vs. Dissolved Hexavalent Chromium Chromium vs. Hexavalent Chromium Comparison	Action
Total Chromium Concentration Nondetect and Hexavalent Chromium Positive; Absolute difference between the positive value and the RL of the ND result is >RL	Qualify Positive and Nondetect J/UJ
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results < 4xRL; Absolute Difference ≤ RL	No Qualification
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results < 4xRL; Absolute Difference > RL	Qualify J
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results ≥ 4xRL; RPD ≤30%	No Qualification
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results ≥ 4xRL; RPD >30%	Qualify J
Total Chromium Concentration Equal to Hexavalent Chromium	No Qualification

All quality control (QC) criteria were met. No qualifiers were applied.

Matrix Spike (MS)

A MS was not performed on a soil site sample in this data set. No validation actions were taken on this basis.

Laboratory Duplicate

A laboratory duplicate was not performed on a soil site sample in this data set. No validation actions were taken on this basis.

Laboratory Control Sample (LCS) Results

The LCS %Rs were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Duplicate

A field duplicate pair was not submitted with this data set. No validation actions were taken on this basis.

Metals (Chromium)

Matrix Spike (MS)/Matrix Spike Duplicate (MSD)

A MS/MSD was not performed on a soil site sample in this data set. No validation actions were taken on this basis.

Laboratory Duplicate

A laboratory duplicate was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Control Sample (LCS) Results

The LCS %Rs were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Duplicate

A field duplicate pair was not submitted with this data set. No validation actions were taken on this basis.

Sample Results

All quality control (QC) criteria were met. No qualifiers were applied.

Data Quality and Usability

In general, these data appear to be valid and may be used for decision-making purposes. No data were qualified as part of this validation. The detected result is presented in Attachments A and B.

ATTACHMENTS

Attachment A: Target Analyte Summary Hit List(s)

Attachment B: Data Validation Report Form

Attachment A

Target Analyte Summary Hit List(s)

Soil Target Analyte Summary Hit List (Hexavalent Chromium)

Site Name Forrest Street Properties
Sampling Date July 21, 2023
Lab Name/ID SGS North America Inc, Dayton, NJ
SDG No JD69726
Sample Matrix Soil
Trip Blank ID NA
Field Blank ID 20230721_90FS_FB

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
20230721_90FS_BW1	JD69726-1	CHROMIUM (HEXAVALENT)	U	566	566	20		
20230721_90FS_CF1	JD69726-2	CHROMIUM (HEXAVALENT)	U	4480	4480	100		

Note: A "U" under Method Blank column indicates a nondetect result.

Soil Target Analyte Summary Hit List (Chromium)

Site Name Forrest Street Properties
Sampling Date July 21, 2023
Lab Name/ID SGS North America Inc, Dayton, NJ
SDG No JD69726
Sample Matrix Soil
Trip Blank ID NA
Field Blank ID 20230721_90FS_FB

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
20230721_90FS_BW1	JD69726-1	CHROMIUM	U	1830	1830	5.2		
20230721_90FS_CF1	JD69726-2	CHROMIUM	U	11000	11000	20		

Note: A "U" under Method Blank column indicates a nondetect result.

Attachment B

Data Validation Report Form

Laboratory: SGS North America Inc., Dayton, NJ		Client/Site Name: Forrest Street Properties	
Laboratory SDG/Job No: JD69726		Project Number: 60586453 RD.MISC	
Validation Level: Full		Date: 7/31/2023	
Number of Samples/Matrix: 2 soil, 1 FB		Validator: Charlene Flint	
Analysis: Hexavalent Chromium/7199		Reviewer and Date: Dani Woitas 8/1/2023	
Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	Yes	No	
Data Completeness	Yes	No	
Sample Preservation	No	No	0.9 °C
Holding Time	Yes	No	Sampled 7/21/2023, analyzed 7/21/2023-7/26/2023
Quantitation Limits	Yes	No	See table below
Dilutions	Yes	No	See table below
Initial Calibration	Yes	No	7/26/2023
Calibration Check Standard (CCS)	Yes	No	
Method Blanks	Yes	No	GN43941 (Aq) ND, GP48218/GN44100 (s) ND
Calibration Blanks	Yes	No	
Field Blanks	Yes	No	20230721_90FS_FB (JD69726-3), ND
Eh/pH	Yes	No	
Matrix Spike	NA	NA	Batch QC (soils), also MS on FB
Laboratory Duplicate	NA	NA	Batch QC (soils), also Dup on FB (ND)
Laboratory Control Standards	Yes	No	GN43941 (aq) 104.7%, GN44100 (s) 89.3%
Field Duplicate	NA	NA	None with this SDG.
Method 7196 Sample Prep	NA	NA	7199 analyses
Total vs Dissolved Results	Yes	No	Total only
Calculation Spot Checks	Yes	No	See calculations below
Percent Solids	NA	NA	Results reported on a wet weight basis

Total Chromium vs Total Hexavalent Chromium

Sample ID	Lab Sample ID	Total Chromium (mg/kg)	Total Chromium Reporting Limit (mg/kg)	Total Hexavalent Chromium (mg/kg)	Total Hexavalent Chromium Reporting Limit (mg/kg)	RPD (%)	Action
20230721_90FS_BW1	JD69726-1	1830	5.2	566	20	106	T Cr > T Cr6, Accept
20230721_90FS_CF1	JD69726-2	11000	20	4480	100	84	T Cr > T Cr6, Accept

Sample ID	Lab Sample ID	Total Chromium (ug/l)	Total Chromium RL (ug/l)	Total Hexavalent chromium (ug/l)	Total Hexavalent chromium RL (ug/l)	RPD (%)	Action
20230721_90FS_FB	JD69726-3		10		10	0	Both ND, Accept

Dilutions

Sample ID	Lab ID	Analyte	Fraction	Dilution
20230721_90FS_BW1	JD69726-1	Hexavalent Chromium	Total	50
20230721_90FS_CF1	JD69726-2	Hexavalent Chromium	Total	250

7199 Replicate RPDs

Sample ID	Rep 1 (ppm)	Rep 2 (ppm)	RPD%	RPD Criteria ≤20
JD69726-1	8.058	8.078	0.2%	OK
JD69726-2	12.655	12.726	0.6%	OK

SDG: JD69726/ Method 7199
Batch GN44100
 Cr+6 ICAL 7/26/23
 Soil
 (p. 435-440)

x - concentration	y - response (area) mAU*min	
0.00	0.00000	STDA
0.005	0.20320	STDB
0.05	1.44750	STDC
0.1	2.88750	STDD
0.5	14.6269	STDE

(p. 435-440)

AECOM Calculated Offset	0.0061	OK	Reported Offset	0.0061
AECOM Slope	29.2223	OK	Reported Slope	29.2223
AECOM Calculated r	1.0000	OK	Reported r	1.0000

LCS calculation **GP48218-B1** **P. 398, 427, 446**
 Highest replicate response (AREA, mAU*min) 6.529
 Instrument Concentration (ug/L) 0.223
 Sample weight 0.0025
 Percent solids 1
 Dilution Factor 4

AECOM Calculated LCS Result (mg/Kg)	35.7	OK, rounding	Reported Result (mg/Kg)	35.7
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%R = Found/True*100 **GP48218-B1** **P. 398, 427, 446**
 True Value (mg/kg) 40

AECOM Calculated %R	89.3	OK, rounding	Reported %R	89.3
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MS calculation **GP48218-S1** **P. 400, 451,** **Batch QC JD69744-1**
 Highest replicate response (mAU*min) 5.748
 Instrument Concentration (ug/L) 0.1965
 Sample weight 0.0025
 Percent solids 1
 Dilution Factor 4

AECOM Calculated MS Result (mg/Kg)	31.4	OK	Reported Result (mg/Kg)	32.1
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%R = Found/True*100 **GP48218-S1** **P. 400, 451,** **Batch QC JD69744-1**
 True Value (mg/kg) 40.8
 Native concentration (mg/Kg) 0.29

%R	76.3	OK	Reported %R	77.9
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Batch QC JD69744-1 **P.**
 Percent Solids
 Empty dish weight=
 Wet weight=
 Dry weight=

AECOM %solids =	#DIV/0!	OK	Reported %solids=	NA*
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*wet weight reported

Reporting limit **JD69726-1** **P. 8, 427, 483** **20230721_90FS_BW1**
 Low Standard 0.01
 Initial weight (g) 0.00244
 Final volume (L) 0.1
 Percent solids 1

Dilution Factor	50			
Reporting Limit	20.49	OK	Reported RL (mg/Kg)=	20.00

<u>Sample Calculations</u>	Batch QC JD69744-	P. 8, 427, 483	0
	1		
Background reading from highest response	0		
Instrument Response highest response	8.078		
Total response for replicate 1	8.078		
Instrument Response (mg/L)	0.276		
Sample weight (mg)	0.00244		
Final Volume (L)	0.1		
Percent solids	1		
Dilution Factor	50		

AECOM Calculated Result (mg/Kg)	566.0	OK	Reported Result (mg/Kg)	566.00
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Laboratory: SGS North America Inc., Dayton, NJ	Client/Site Name: Forrest Street Properties
Laboratory SDG/Job No: JD69726	Project Number: 60586453 RD.MISC
Validation Level: Limited	Date: 7/31/2023
Number of Samples/Matrix: 2 soil, 1 FB	Validator: Charlene Flint
Analysis: Chromium/6010D	Reviewer and Date: Dani Woitas 8/1/2023

Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	Yes	No	
Data Completeness	Yes	No	
Sample Preservation	No	No	0.9 °C
Holding Time	Yes	No	Sampled 7/21/2023, analyzed 07/25/2023 - 07/26/2023
Quantitation Limits	Yes	No	
Dilutions	Yes	No	See table below
Method Blanks	Yes	No	MP40927 (aq) ND, MP 40930 (s) ND
Field Blanks	Yes	No	20230721_90FS_FB (JD69726-3), ND
Matrix Spike	NA	NA	Batch QC Cr (s), 20230721_90FS_FB (JD69726-3) aq 100%R
Matrix Spike Duplicate	NA	NA	Batch QC Cr (s), 20230721_90FS_FB (JD69726-3) aq 97%R, RPD 3.0%
Post Digestion Spike	NA	NA	Batch QC
Laboratory Duplicate	NA	NA	None with this SDG
Laboratory Control Standards	Yes	No	MP40927 (aq) 98.5%R, MP40930 (s) 98.5%R
Field Duplicate	NA	NA	None in this SDG.
Total Metals vs Dissolved Metals Results	NA	NA	Total only
Total/Dissolved Cr vs Total/Dissolved HexCr Results	Yes	No	see hexavalent chromium section for table
Percent Solids	NA	NA	Results reported on a wet weight basis

Dilutions

Sample ID	Lab ID	Analyte	Fraction	Dilution
20230721_90FS_BW1	JD69726-1	Chromium	Total	5
20230721_90FS_CF1	JD69726-2	Chromium	Total	20

Data Validation Report

Project:	Forrest Street Properties	
Laboratory:	SGS North America Inc., Dayton, NJ	
Laboratory Job No.:	JD70819	
Analysis/Method:	Hexavalent Chromium SW846 3060A/7199/7196A Metals (ICP/MS) SW-846 3050B/6010D	
Validation Level:	Full (Hexavalent Chromium) Limited (Chromium)	
Site Location/Address:	70 Carteret Avenue, Jersey City, NJ	
AECOM Project No:	60586453 RD.MISC	
Prepared by:	Charlene Livingston Flint /AECOM	Completed on: 08/18/2023
Reviewed by:	Dani Woitas/AECOM	File Name: JD70819_2023-08-18_DVReport-F

Introduction

The data were reviewed in accordance with the FSP-QAPP and the following NJDEP validation Standard Operating Procedure (SOP):

- NJDEP Office of Data Quality SOP 5.A.10, Rev 3 (September 2009), SOP for Analytical Data Validation of Hexavalent Chromium - for USEPA SW-846 Method 3060A, USEPA SW-846 Method 7196A and USEPA SW-846 Method 7199;
- NJDEP Office of Data Quality SOP 5.A.16, Rev 1 (May 2002), Quality Assurance Data Validation of Analytical Deliverables for Inorganics (based on USEPA SW-846 Methods);

The results of quality control data analyzed with site samples were used to assess the overall reliability of the data. The following qualifiers were used to identify data quality issues:

- U: Indicates the analyte was not detected in the sample above the sample reporting limit.
- J: Indicates the result was an estimated value; the associated numerical value was an approximate concentration of the analyte in the sample.
- J+: Indicates the analyte was positively identified; the associated numerical value is an estimated quantity with a potential high bias.
- J-: Indicates the analyte was positively identified; the associated numerical value is an estimated quantity with a potential low bias.
- UJ: Indicates the analyte was not detected above the reporting limit and the reporting limit was approximate.

- UB: The analyte concentration is less than or equal to three (3) times the concentration in the associated method/prep blank. The presence of the analyte in the sample is negated (UB) due to laboratory contamination.
- JB: The analyte concentration is greater than three (3) times, but less than or equal to ten (10) times the concentration in the associated method/prep blank. The presence of that analyte in the sample is considered "real". The concentration is quantitatively qualified (JB) due to method blank contamination.
- R: The sample result was rejected due to serious deficiencies; the presence or absence of the analyte could not be confirmed.
- RA: The sample result was rejected but is still considered usable.

Sample Information

The samples listed below were collected by AECOM on August 10, 2023 as part of the Forrest Street Properties sampling at 70 Carteret Avenue, Jersey City, New Jersey. Only the samples and parameters listed below were validated.

Field ID	Laboratory ID	Matrix	Fraction
20230810_90FS_BW2	JD70819-1	Soil	Hexavalent Chromium, Chromium
20230810_90FS_FB	JD70819-3	Field Blank	Hexavalent Chromium, Chromium

The samples were collected following the procedures detailed in the Work Order for Forest Street Properties sampling at 70 Carteret Avenue, Jersey City, NJ and the Field Sampling Plan/Quality Assurance Project Plan for Non-Residential and Residential Chromium Sites Hudson County, New Jersey (December 2011).

General Comments

The data package was complete. Quality control (QC) issues identified during validation are discussed below. Refer to the Target Analyte Summary Hit List(s) in Attachment A for a listing of all detected results, qualified results, and associated qualifications, where applicable. The nonconformances for each section discussed below are presented in Attachment B.

The chain of custody (COC) lists sample 20230810_90FS_Flecks (JD70819-2) for hexavalent chromium and chromium analysis. The sample was not analyzed.

Hexavalent Chromium

Sample Results

The results for total chromium and total hexavalent chromium were compared to ensure that the total chromium concentration was greater than the total hexavalent chromium concentration in each sample. Refer to the tables in Attachment B for results and actions. Sample results were evaluated as follows:

Actions: No guidance exists for comparison of total and hexavalent results therefore the following is based on professional judgement and the duplicate criteria in the FSP QAPP.

Total Hexavalent Chromium vs. Dissolved Hexavalent Chromium Chromium vs. Hexavalent Chromium Comparison	Action
Total Chromium Concentration Greater than Hexavalent Chromium Concentration	No Qualification
Total Chromium Concentration Nondetect and Hexavalent Chromium Positive; Absolute difference between the positive value and the RL of the ND result is >RL	Qualify Positive and Nondetect J/UJ
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results < 4xRL; Absolute Difference ≤ RL	No Qualification
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results < 4xRL; Absolute Difference > RL	Qualify J
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results ≥ 4xRL; RPD ≤30%	No Qualification
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results ≥ 4xRL; RPD >30%	Qualify J
Total Chromium Concentration Equal to Hexavalent Chromium	No Qualification

All quality control (QC) criteria were met. No qualifiers were applied.

Matrix Spike (MS)

Sample 20230810_90FS_BW2 (JD70819-1) was analyzed as a MS for this data set. All QC acceptance criteria were met.

Laboratory Duplicate

Sample 20230810_90FS_BW2 (JD70819-1) was analyzed as a laboratory duplicate for this data set. The relative percent difference (RPD) did not meet the quality control (QC) limits. Results were estimated (J).

Laboratory Control Sample (LCS) Results

The LCS %Rs were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Duplicate

A field duplicate pair was not submitted with this data set. No validation actions were taken on this basis.

Metals (Chromium)

Matrix Spike (MS)/Matrix Spike Duplicate (MSD)

A MS/MSD was not performed on a soil site sample in this data set. No validation actions were taken on this basis.

Laboratory Duplicate

A laboratory duplicate was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Control Sample (LCS) Results

The LCS %Rs were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Duplicate

A field duplicate pair was not submitted with this data set. No validation actions were taken on this basis.

Sample Results

All quality control (QC) criteria were met. No qualifiers were applied.

Data Quality and Usability

In general, these data appear to be valid and may be used for decision-making purposes. Qualified results are discussed in attachments A and B below.

Results estimated due to poor laboratory duplicate precision are useable with an unknown bias.

ATTACHMENTS

Attachment A: Target Analyte Summary Hit List(s)

Attachment B: Data Validation Report Form

Attachment A

Target Analyte Summary Hit List(s)

Soil Target Analyte Summary Hit List (Hexavalent Chromium)

Site Name Forrest Street Properties
Sampling Date August 10, 2023
Lab Name/ID SGS North America Inc, Dayton, NJ
SDG No JD70819
Sample Matrix Soil
Trip Blank ID NA
Field Blank ID 20230810_90FS_FB

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
20230810_90FS_BW2	JD70819-1	CHROMIUM (HEXAVALENT)	U	224	224J	7.9	Qualify	1

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

NJDEP Laboratory Footnote

1. Laboratory duplicate precision criteria were not met.

Soil Target Analyte Summary Hit List (Chromium)

Site Name Forrest Street Properties
Sampling Date August 10, 2023
Lab Name/ID SGS North America Inc, Dayton, NJ
SDG No JD70819
Sample Matrix Soil
Trip Blank ID NA
Field Blank ID 20230810_90FS_FB

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/kg)	Laboratory Sample Result (mg/kg)	Validation Sample Result (mg/kg)	RL (mg/kg)	Quality Assurance Decision	NJDEP Validation Footnote
20230810_90FS_BW2	JD70819-1	CHROMIUM	U	523	523	1.0		

Note: A "U" under Method Blank column indicates a nondetect result.

A "U" under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

Attachment B

Data Validation Report Form

Laboratory: SGS North America Inc., Dayton, NJ	Client/Site Name: Forrest Street Properties
Laboratory SDG/Job No: JD70819	Project Number: 60586453 RD.MISC
Validation Level: Full	Date: 8/18/2023
Number of Samples/Matrix: 1 soil, 1 FB	Validator: Charlene Flint
Analysis: Hexavalent Chromium/7199/7196A	Reviewer and Date: Dani Woitas 8/21/2023

Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	Yes	No	
Data Completeness	Yes	No	
Sample Preservation	Yes	No	2.3 °C
Holding Time	Yes	No	Sampled 8/10/2023, analyzed 8/10/2023, 8/14/2023
Quantitation Limits	Yes	No	
Dilutions	Yes	No	20230810_90FS_BW2 (JD70819-1) dil 20x
Initial Calibration	Yes	No	8/14/2023 7199 (s), 8/10/2023 7196 (aq)
Calibration Check Standard (CCS)	Yes	No	
Method Blanks	Yes	No	GN44657-MB1 (Aq) ND, GP48632/GN44762 (s) ND
Calibration Blanks	Yes	No	
Field Blanks	Yes	No	20230810_90FS_FB (JD70819-3), ND
Eh/pH	Yes	No	
Matrix Spike	Yes	No	20230810_90FS_BW2 (JD70819-1), see table below
Laboratory Duplicate	No	Yes	20230810_90FS_BW2 (JD70819-1), see table below
Laboratory Control Standards	Yes	No	GN44657 (aq) 100.7%, GN44762 (s) 96.3%, 94.5%
Field Duplicate	NA	NA	None with this SDG.
Method 7196 Sample Prep	Yes	No	
Total vs Dissolved Results	Yes	No	Total only
Calculation Spot Checks	Yes	No	See calculations below
Percent Solids	NA	NA	Results reported on a wet weight basis

Matrix Spikes

20230810_90FS_BW2 (JD70819-1)

Analyte	Fraction	Spike added (ug/l)	SR (ug/l)	SSR MS (ug/l)	SDR (ug/l)	MS % R	MSD % R	Upper Limit	Lower Limit	RPD %	RPD Upper Limit	Action
Chromium (Hexavalent)	Total (soluble)	40.7	224	269	NA	110.7	NA	125	75	NA	20	OK, Accept
Chromium (Hexavalent)	Total (Insoluble)	1060	224	1270	NA	98.9	NA	125	75	NA	20	OK, Accept

Laboratory Duplicate

20230810_90FS_BW2 (JD70819-1)

Analyte	Fraction	SR (ug/l)	RL	SDR (ug/l)	RL	RPD %	RPD Upper Limit	Action
Chromium (Hexavalent)	Total	224	7.9	281	7.9	22.6	20	RPD>20%, Estimate (J)

Total Chromium vs Total Hexavalent Chromium

Sample ID	Lab Sample ID	Total Chromium (mg/kg)	Total Chromium Reporting Limit (mg/kg)	Total Hexavalent Chromium (mg/kg)	Total Hexavalent Chromium Reporting Limit (mg/kg)	RPD (%)	Action
20230810_90FS_BW2	JD70819-1	523	1.0	224	7.9	106	T Cr > T Cr6, Accept

Sample ID	Lab Sample ID	Total Chromium (ug/l)	Total Chromium RL (ug/l)	Total Hexavalent chromium (ug/l)	Total Hexavalent chromium RL (ug/l)	RPD (%)	Action
20230810_90FS_FB	JD70819-3		10		0.010		Both ND, Accept

7199 Replicate RPDs

Sample ID	Lab ID	Rep 1 (ppm)	Rep 2 (ppm)	RPD%	RPD Criteria ≤20
20230810_90FS_BW2	JD70819-1	8.294	8.207	1.1%	OK

SDG: JD70819/ Method 7199

Batch GN44762

Cr+6 ICAL 8/14/23
Soil
(p. 296-301)

x - concentration	y - response (area) mAU*min
0.00	0.00000
0.005	0.23490
0.05	1.52390
0.1	2.96450
0.5	14.6296

STDA
STDB
STDC
STDD
STDE

(p. 296-301)

AECOM Calculated Offset	0.0718	OK	Reported Offset	0.0718
AECOM Slope	29.1081	OK	Reported Slope	29.1080
AECOM Calculated r	1.0000	OK	Reported r	1.0000

LCS calculation

GP48632-B1

P. 273, 306

Highest replicate response (AREA, mAU*min) 7.071
Instrument Concentration (ug/L) 0.240
Sample weight 0.0025
Percent solids 1
Dilution Factor 4

AECOM Calculated LCS Result (mg/Kg)	38.5	OK	Reported Result (mg/Kg)	38.5
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%R = Found/True*100

GP48632-B1

P. 273, 306

True Value (mg/kg) 40

AECOM Calculated %R	96.2	OK	Reported %R	96.3
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MS calculation

GP48632-S1

P. 275, 289, 338

20230810_90FS_BW2

Highest replicate response (mAU*min) 7.77
Instrument Concentration (ug/L) 0.2645
Sample weight 0.00246
Percent solids 1
Dilution Factor 25

AECOM Calculated MS Result (mg/Kg)	268.8	OK	Reported Result (mg/Kg)	269.0
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%R = Found/True*100

GP48632-S1

P. 275, 289, 338

20230810_90FS_BW2

True Value (mg/kg) 40.7
Native concentration (mg/Kg) 224

%R	110.0	OK	Reported %R	110.7
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Percent Solids

20230810_90FS_BW2

P.

Empty dish weight=
Wet weight=
Dry weight=

AECOM %solids =	#DIV/0!	OK	Reported %solids=	NA*
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*wet weight reported

Reporting limit

JD70819-1

P. 8, 289, 310

20230810_90FS_BW2

Low Standard 0.01
Initial weight (g) 0.00252
Final volume (L) 0.1
Percent solids 1
Dilution Factor 20

Reporting Limit	7.94	OK	Reported RL (mg/Kg)=	7.9
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Sample Calculations

20230810_90FS_BW2

P. 8, 289, 310

Background reading from highest response 0
Instrument Response highest response 8.294
Total response for replicate 1 8.294
Instrument Response (mg/L) 0.282

Sample weight (mg)	0.00252
Final Volume (L)	0.1
Percent solids	1
Dilution Factor	20

AECOM Calculated Result (mg/Kg)	224.2	OK	Reported Result (mg/Kg)	224.00
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Laboratory: SGS North America Inc., Dayton, NJ	Client/Site Name: Forrest Street Properties
Laboratory SDG/Job No: JD70819	Project Number: 60586453 RD.MISC
Validation Level: Limited	Date: 8/18/2023
Number of Samples/Matrix: 1 soil, 1 FB	Validator: Charlene Flint
Analysis: Chromium/6010D	Reviewer and Date: Dani Woitas 8/21/2023

Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	Yes	No	
Data Completeness	Yes	No	
Sample Preservation	No	No	2.3 °C
Holding Time	Yes	No	Sampled 8/10/2023, analyzed 08/12/2023 - 08/14/2023
Quantitation Limits	Yes	No	
Dilutions	Yes	No	No dilution
Method Blanks	Yes	No	MP41316 (aq) ND, MP 41290 (s) ND
Field Blanks	Yes	No	20230810_90FS_FB (JD70819-3), ND
Matrix Spike	NA	NA	Batch QC Cr (s and aq)
Matrix Spike Duplicate	NA	NA	Batch QC Cr (s and aq)
Post Digestion Spike	NA	NA	
Laboratory Duplicate	NA	NA	None with this SDG
Laboratory Control Standards	Yes	No	MP41316 (aq) 95.0%R, MP41290 (s) 96.5%R
Field Duplicate	NA	NA	None in this SDG.
Total Metals vs Dissolved Metals Results	NA	NA	Total only
Total/Dissolved Cr vs Total/Dissolved HexCr Results	Yes	No	see hexavalent chromium section for table
Percent Solids	NA	NA	Results reported on a wet weight basis