Appendix H

Data Validation Reports

(Provided Separately)

Laboratory analytical reports and data validation reports are provided for sample locations that are remaining in place and other specific locations that were removed by the RA that are required to document compliance with the remediation goals.

25 May, 2011

Dresdner-Robin Environmental Management
Att: Mr. Douglas Neumann, Director
371 Warren Street
Jersey City, New Jersey 07302

Re: PPG – Site 107, Laboratory Job No. 460-22995-1

Dear Mr. Neumann,

This cover letter, and the attached documents, detail the data validation findings associated with the following sample analytical results contained in the above-referenced deliverables set:

Site Name: PPG – Site 107

Fractions
Hexavalent chromium (Cr^{+6})
Total Metals (Cr, Ni, Sb, Tl, V)
pH / Eh ; ORP

Laboratory: TestAmerica Laboratories, Inc.

Report No.: 460-22995-1

Matrix: Non-Aqueous

Reviewer: Chris Taylor

Prepared By: Environmental Quality Associates, Inc.
487 Shoddy Hollow Road
Middletown, New York 10940

SECTION A
Sample Information

The above-noted laboratory Job Number samples were analyzed by TestAmerica Laboratories, Inc., Edison, NJ (NJ Laboratory ID Cert. No. 12028). Hexavalent chromium (Cr^{+6}) samples were prepared and analyzed using USEPA SW-846 methods 3060A and 7196A. Total metals samples were prepared and analyzed using USEPA SW-846 methods 3050B (3010A for aqueous samples) and 6010B. Oxidation / Reduction Potential (ORP) characteristics were determined by measurement of pH / Eh values for samples and subsequent extrapolation against the $HCrO_4$- / $Cr(OH)_3$ phase diagram; pH and Eh values were measured by Standard Methods 4500H-B and 2580B, respectively.

A summary table of samples analyzed is presented below. Please note that the number of 'Total Samples' listed below is exclusive of associated QC samples (MS / MD).

Sample ID	Lab ID		Date	Analysis	
107_-	460-22995-	Matrix	Collected	Hex Cr	Metals
M034_0.0	1	S	02/10/11	X	X
M034_3.0	2	S	02/10/11	X	X
M034_3.5	3	S	02/10/11	X	X
M034_5.0	4	S	02/10/11	X	X
M034_7.5	5	S	02/10/11	X	X
M034_9.5	6	S	02/10/11	X	X
M034_13.5	7	S	02/10/11	X	X
M034_17.5	8	S	02/10/11	X	X
M032_0.0	9	S	02/10/11	X	X
M032_0.5	10	S	02/10/11	X	X
M032_1.5	11	S	02/10/11	X	X
M032_3.0	12	S	02/10/11	X	X
M032_7.0	13	S	02/10/11	X	X
M032_11.0	14	S	02/10/11	X	X
M030_0.0	15	S	02/10/11	X	X
M030_0.5	16	S	02/10/11	X	X
M030_2.5	17	S	02/10/11	X	X
M030_3.5	18	S	02/10/11	X	X
M030_7.5	19	S	02/10/11	X	X
M030_11.5	20	S	02/10/11	X	X
M028_0.0	21	S	02/10/11	X	X
M028_0.5	22	S	02/10/11	X	X
M028_1.0	23	S	02/10/11	X	X
M028_3.5	24	S	02/10/11	X	X
M028_7.5	25	S	02/10/11	X	X
M028_11.5	26	S	02/10/11	X	X
M026_0.5	27	S	02/10/11	X	X
M026_3.0	28	S	02/10/11	X	X
M026_4.0	29	S	02/10/11	X	X
M026_8.0	30	S	02/10/11	X	X
M026_12.0	31	S	02/10/11	X	X
M026_0.0	32	S	02/10/11	X	X
M024_0.0	33	S	02/10/11	X	X
M024_0.5	34	S	02/10/11	X	X
M024_2.0	35	S	02/10/11	X	X
M024_3.5	36	S	02/10/11	X	X
M024_7.5	37	S	02/10/11	X	X
M024_15.5	38	S	02/10/11	X	X
REP-021011-1	39	S	02/10/11	X	X
FB021011	40	A	02/10/11	X	X

S = Non-Aqueous Matrix Total Samples = 40
A = Aqueous Matrix **Bold Type** indicates sample taken as a Batch QC sample

All samples were received one day following collection. Samples were received on ice at recorded temperature of 2.6 °C, in good condition.

SECTION C
Hexavalent Chromium

Holding times from sample collection to analysis (≤24 hours for aqueous matrix; ≤30 days for non-aqueous matrix) were met for all samples.

All calibration and QC criteria were met for this sample group, including: initial calibration linearity, continuing calibration frequency and accuracy, blanks, duplicate precision, and matrix and post-spike recoveries. Reported spike recoveries, duplicate precision values, reported % moisture (% solids) and reported Cr^{+6} results were randomly verified from the raw data with no disparities between reported and calculated results found.

Cr^{+6} was reported positive in Field Blank FB-021011, at 1.9 J ug/L, which is equivalent to 0.076 mg/Kg (nominal). The following samples exhibited positive results which were >3x but <10x the field blank result: 460-22995- 4, -6, -19 and -31.

- QA Action: Qualify Cr^{+6} results in above-noted samples as estimated, 'J', with indication of high bias due to field blank contamination.

SECTION D
Total Metals

Holding times from sample collection to analysis were met for all total metals samples.

Calibration and QC criteria were met for this sample group, including: initial calibration linearity, continuing calibration frequency and accuracy, blanks, interference checks, matrix spike and LCS recoveries and serial dilution sample precision, *with the exceptions detailed below*. Reported spike recoveries, duplicate precision values, reported % moisture (% solids) and reported metal results were randomly verified from the raw data with no disparities between reported and calculated results found.

The precision (RPD) value for chromium (Cr) between lab replicates of sample 460-22995-22 was reported above the limit of 20%, at 29%.

- QA Action: Qualify Cr results in in associated field samples (460-22995-6 through -25) as estimated values 'J', with indeterminate bias direction.

It is noted that no post-digestion spike samples were reported for this delivery group.

No positive element results were reported for the field blank sample (FB-021011).

SECTION E
pH / Eh (ORP)

Samples for pH analysis were analyzed outside the method-defined holding-time of 15 minutes, which is essentially a 'field-performed' analysis. The laboratory assigned all reported pH results an 'HF' qualifier flag to indicate this exception. Since the samples were chilled on receipt at the lab, and analyzed within one day of receipt, no data validation qualifiers were assigned.

Calibrations for pH analysis were acceptable, as were required QC criteria (sample duplicates). Standard mV solution checks for Eh (Light's solution) were within acceptable ranges, as were sample duplicate measurements.

Reported pH and eH (ORP) values and resulting ReDox (reducing or oxidizing) characteristics were randomly verified from the $HCrO_4$- / $Cr(OH)_3$ phase diagram; no disparities relative to reported values and characteristics were found. These values are only used for data assessment purposes when Cr^{+6} sample spike recoveries are outside acceptable recovery ranges.

SECTION F
COLLOCATED SAMPLES

Sample REP-021011-1 was not identified with a corresponding collocated field sample.

SECTION G
Overall Recommendations

The results of the review and validation process for the above analytical fractions and associated samples are summarized on the attached standard-format NJDEP Data Validation Report Forms, in order to facilitate the end-user's' review of these data.

Very truly yours,
Environmental Quality Associates, Inc.

Chris W. Taylor
Vice President

26 May, 2011

Dresdner-Robin Environmental Management
Att: Mr. Douglas Neumann, Director
371 Warren Street
Jersey City, New Jersey 07302

Re: PPG – Sites 107 and 108, Laboratory Job No. 460-23018-1

Dear Mr. Neumann,

This cover letter, and the attached documents, detail the data validation findings associated with the following sample analytical results contained in the above-referenced deliverables set:

Site Name: PPG – Sites 107 and 108

Fractions
Hexavalent chromium (Cr^{+6})
Total Metals (Cr, Ni, Sb, Tl, V)
pH / Eh ; ORP

Laboratory: TestAmerica Laboratories, Inc.

Report No.: 460-23018-1

Matrix: Non-Aqueous

Reviewer: Chris Taylor

Prepared By: Environmental Quality Associates, Inc.
487 Shoddy Hollow Road
Middletown, New York 10940

SECTION A
Sample Information

The above-noted laboratory Job Number samples were analyzed by TestAmerica Laboratories, Inc., Edison, NJ (NJ Laboratory ID Cert. No. 12028). Hexavalent chromium (Cr^{+6}) samples were prepared and analyzed using USEPA SW-846 methods 3060A and 7196A. Total metals samples were prepared and analyzed using USEPA SW-846 methods 3050B (3010A for aqueous samples) and 6010B. Oxidation / Reduction Potential (ORP) characteristics were determined by measurement of pH / Eh values for samples and subsequent extrapolation against the $HCrO_4$- / $Cr(OH)_3$ phase diagram; pH and Eh values were measured by Standard Methods 4500H-B and 2580B, respectively.

A summary table of samples analyzed is presented below. Please note that the number of 'Total Samples' listed below is exclusive of associated QC samples (MS / MD).

Site ID	Sample ID	Lab ID 460-23018-	Matrix	Date Collected	Analysis	
					Hex Cr	Metals
107_	M022_0.0	1	S	02/11/11	X	X
107_	M022_1.0/2.0	2	S	02/11/11	X	X
107_	M022_4.0/4.5	3	S	02/11/11	X	X
107_	M022_4.5	4	S	02/11/11	X	X
107_	M022_8.5	**5**	S	02/11/11	X	X
107_	M022_12.5	6	S	02/11/11	X	X
---	FB021111	7	A	02/11/11	X	X
107_	REP021111-1	8	S	02/11/11	X	X
108_	REP021111-2	9	S	02/11/11	X	X
108_	REP021111-3	10	S	02/11/11	X	X
107_	M020_0.0	11	S	02/11/11	X	X
107_	M020_3.5	12	S	02/11/11	X	X
107_	M020_7.5	13	S	02/11/11	X	X
107_	M020_11.5	14	S	02/11/11	X	X
107_	M020_1.0/1.2	15	S	02/11/11	X	X
107_	M020_2.5	16	S	02/11/11	X	X
107_	M020_3.0	17	S	02/11/11	X	X
108_	K018_0.0	18	S	02/11/11	X	X
108_	K018_4.5	19	S	02/11/11	X	X
108_	K018_8.5	20	S	02/11/11	X	X
108_	K018_12.5	21	S	02/11/11	X	X
108_	I018_0.0	22	S	02/11/11	X	X
108_	I018_4.5	**23**	S	02/11/11	X	X
108_	I018_8.5	24	S	02/11/11	X	X
108_	I018_12.5	25	S	02/11/11	X	X
108_	G018_0.0	26	S	02/11/11	X	X
108_	G018_3.5	27	S	02/11/11	X	X
108_	G018_5.5	28	S	02/11/11	X	X
108_	G018_9.5	29	S	02/11/11	X	X
108_	G018_13.5	30	S	02/11/11	X	X

S = Non-Aqueous Matrix
A = Aqueous Matrix

Total Samples = 30
Bold Type indicates sample taken as a Batch QC sample

All samples were received on the same day of collection. Samples were received on ice at recorded temperature of 3.2°C.

SECTION C
Hexavalent Chromium

Holding times from sample collection to analysis (≤24 hours for aqueous matrix; ≤30 days for non-aqueous matrix) were met for all samples.

All calibration criteria were met for this sample group, including: initial calibration linearity and continuing calibration frequency and accuracy. Method and calibration blanks were free of contamination. Reported spike recoveries, duplicate precision values, reported % moisture (% solids) and reported Cr^{+6} results were randomly verified from the raw data with no disparities between reported and calculated results found. Several samples were re-analyzed at dilution in order to bring absorbance values into calibrated range; reported RL values were adjusted based on dilution used.

Cr^{+6} was not detected in Field Blank FB021111.

SECTION D
Total Metals

Holding times from sample collection to analysis were met for all total metals samples.

Calibration and QC criteria were met for this sample group, including: initial calibration linearity, continuing calibration frequency and accuracy, blanks, interference checks, matrix spike recoveries, duplicate precision, LCS recoveries and serial dilution sample precision, *with the exception detailed below*. Reported spike recoveries, duplicate precision values, reported % moisture (% solids) and reported metal results were randomly verified from the raw data with no disparities between reported and calculated results found.

The recovery for antimony in the matrix spike of sample 108_I018_4.5 (Lab ID# 460-23018-23) was below the limit of 75%, at 62%. The associated LCS recoveries for Sb were within acceptable limits, indicating analytical process control.

- QA Action: Qualify Sb results in associated samples 460-23018-23 through -30 (inclusive) as estimated, 'UJ' or 'J', with indication of low bias due to sample matrix effects.

It is noted that no post-digestion spike samples were reported for this delivery group. Serial dilution samples were reported; no results in these samples exceeded the applicable threshold for calculation of percent difference.

No positive element results were reported for the field blank sample (FB-1).

SECTION E
pH / Eh (ORP)

Samples for pH analysis were analyzed outside the method-defined holding-time of 15 minutes, which is essentially a 'field-performed' analysis. The laboratory assigned all reported pH results an 'HF' qualifier flag to indicate this exception. Since the samples were chilled on receipt at the lab, and analyzed within one day of receipt, no data validation qualifiers were assigned.

Calibrations for pH analysis were acceptable, as were required QC criteria (sample duplicates). Standard mV solution checks for Eh (Light's solution) were within acceptable ranges, as were sample duplicate measurements.

Reported pH and eH (ORP) values and resulting ReDox (reducing or oxidizing) characteristics were randomly verified from the $HCrO_4$- / $Cr(OH)_3$ phase diagram; no disparities relative to reported values and characteristics were found. These values are only used for data assessment purposes when Cr^{+6} sample spike recoveries are outside acceptable recovery ranges.

SECTION F
COLLOCATED SAMPLES

REP021111-1, -2 and -3 were identified as being collocated with 107_M020_7.5, 108_K018_8.5, and 108_G018_3.5 (460-23018-13, -20 and -27), respectively. Precision results (as %RPD) are tabulated below. Note: ND = Not Detected ; nc = not calculated ; * = absolute difference is shown if either sample <5x CRQL

	M020_7.5	R021111-1	%RPD	K018_8.5	R021111-2	%RPD	G018_3.5	R021111-3	%RPD
Chromium	21.6	24.5	12.6	14.3	13.6	5.0	16.7	15.5	7.5
Nickel	12.0	12.5	0.5 *	13.7	12.5	1.2 *	17.9	16.6	1.3 *
Antimony	ND	ND	nc	ND	ND	nc	ND	ND	nc
Thallium	ND	ND	nc	ND	ND	nc	ND	ND	nc
Vanadium	17.4	18.7	1.3 *	20.8	19.7	1.1 *	23.0	20.7	2.3 *
Cr (VI)	1.2 J	1.2 J	0	ND	ND	nc	ND	ND	nc

The NJDEP DV guidance protocols do not provide qualification thresholds for field duplicate precision values; however, EPA Region II data validation guidance (SOP No. HW-2, Rev. 13, Sept. 2006) provides for a qualification range of >35%, <120% RPD for soils >5x CRQL values, and difference >2x CRQL if either sample is <5x CRQL. No QA action is necessary based on the above field duplicate precision results.

SECTION G
Overall Recommendations

The results of the review and validation process for the above analytical fractions and associated samples are summarized on the attached standard-format NJDEP Data Validation Report Forms, in order to facilitate the end-user's' review of these data.

Very truly yours,
Environmental Quality Associates, Inc.

Chris W. Taylor
Vice President

02 June, 2011
Revised 22 June, 2011

Dresdner-Robin Environmental Management
Att: Mr. Douglas Neumann, Director
371 Warren Street
Jersey City, New Jersey 07302

Re: PPG – Site 108, Laboratory Job No. 460-23155-1

Dear Mr. Neumann,

This cover letter, and the attached documents, detail the data validation findings associated with the following sample analytical results contained in the above-referenced deliverables set:

Site Name: PPG – Site 108

Fractions
Hexavalent chromium (Cr^{+6})
Total Metals (Cr, Ni, Sb, Tl, V)
pH / Eh ; ORP

Laboratory: TestAmerica Laboratories, Inc.

Report No.: 460-23155-1

Matrix: Non-Aqueous

Reviewer: Chris Taylor

Prepared By: Environmental Quality Associates, Inc.
487 Shoddy Hollow Road
Middletown, New York 10940

SECTION A
Sample Information

The above-noted laboratory Job Number samples were analyzed by TestAmerica Laboratories, Inc., Edison, NJ (NJ Laboratory ID Cert. No. 12028). Hexavalent chromium (Cr^{+6}) samples were prepared and analyzed using USEPA SW-846 methods 3060A and 7196A. Total metals samples were prepared and analyzed using USEPA SW-846 methods 3050B (3010A for aqueous samples) and 6010B. Oxidation / Reduction Potential (ORP) characteristics were determined by measurement of pH / Eh values for samples and subsequent extrapolation against the $HCrO_4$- / $Cr(OH)_3$ phase diagram; pH and Eh values were measured by Standard Methods 4500H-B and 2580B, respectively.

A summary table of samples analyzed is presented below. Please note that the number of 'Total Samples' listed below is exclusive of associated QC samples (MS / MD).

Sample ID 108_	Lab ID 460-23155-	Matrix	Date Collected	Analysis	
				Hex Cr	Metals
C018_0.0	1	S	02/16/11	X	X
C018_2.5	2	S	02/16/11	X	X
C018_6.5	3	S	02/16/11	X	X
C018_9.5	4	S	02/16/11	X	X
F016_0.0	5	S	02/16/11	X	X
F016_2.0	6	S	02/16/11	X	X
F016_6.0	7	S	02/16/11	X	X
F016_10.0	8	S	02/16/11	X	X
H016_0.0	9	S	02/16/11	X	X
H016_2.0	10	S	02/16/11	X	X
H016_6.0	11	S	02/16/11	X	X
H016_10.0	12	S	02/16/11	X	X
M014_0.0	13	S	02/16/11	X	X
M014_10.0	14	S	02/16/11	X	X
M014_15.0	**15**	S	02/16/11	X	X
M014_19.0	16	S	02/16/11	X	X
REP021611-2	17	S	02/16/11	X	X
M016_0.0	18	S	02/16/11	X	X
M016_3.5	19	S	02/16/11	X	X
M016_5.5	20	S	02/16/11	X	X
M016_9.5	21	S	02/16/11	X	X
M016_13.5	22	S	02/16/11	X	X
M016_REP021611-1	23	S	02/16/11	X	X
FB021611	24FB	A	02/16/11	X	X

S = Non-Aqueous Matrix
A = Aqueous Matrix

Total Samples = 24
Bold Type indicates sample taken as a Batch QC sample

All samples were received one day from collection. Samples were received on ice at recorded temperature of 2.5°C.

SECTION C
Hexavalent Chromium

Holding times from sample collection to analysis (≤24 hours for aqueous matrix; ≤30 days for non-aqueous matrix) were met for all samples.

All calibration criteria were met for this sample group, including: initial calibration linearity and continuing calibration frequency and accuracy. Method and calibration blanks for soils were free of contamination. Reported spike recoveries, duplicate precision values, reported % moisture (% solids) and reported Cr^{+6} results were randomly verified from the raw data with no disparities between reported and calculated results found.

Cr^{+6} was reported positive in Field Blank FB021611 at 3.4 JB ug/L. The associated Cr^{+6} method blank was reported positive at 3.4 J ug/L, as were both associated calibration blanks (ICB, CCB) at the same concentration. This is equivalent to a nominal dry-weight value of 0.136 mg/Kg. For qualification assessment, associated positive Cr^{+6} soil results below 3x adjusted nominal value are negated, while results >3x but <10x adjusted nominal values are qualified as estimated, 'J', with indication of positive bias.

- QA Action: The reported Cr^{+6} result for sample 460-23155-14 (108_M014_10.0) was >3x but <10x the adjusted nominal blank value, and was flagged as estimated, 'J', with indication of positive bias due to blank contamination.

SECTION D
Total Metals

Holding times from sample collection to analysis were met for all total metals samples.

Samples 460-23155-1 (and its MS, DU and SD) exhibited incorrectly reported Result, RL, MDL and Units values, as raw concentration values in mg/L, rather than as mg/Kg dry-weight values. Therefore, the reported values are under-reported by a nominal factor of 50x in both the laboratory report and the associated EDD results summary.

- QA Action: Reported results for associated sample 460-23155-1 were re-calculated by the reviewer and reported to client. The laboratory was contacted and requested to determine and resolve the cause of the erroneous values via corrective action process, and to correct and re-issue the affected report sections.
    - *Post-Script: The laboratory re-digested and re-analyzed the affected sample noted above on 06/08/11, and submitted a revised report including the re-analyis results and associated batch calibrations and QC samples.*

Calibration and QC criteria were met for this sample group, including: initial calibration linearity, continuing calibration frequency and accuracy, blanks, interference checks, matrix spike recoveries, duplicate precision, LCS recoveries and serial dilution sample precision, *with the exceptions detailed below*. Reported spike recoveries, duplicate precision values, reported % moisture (% solids) were randomly verified from the raw data with no disparities between reported and calculated results found. *Exception: see QA Action above.*

The calibration blanks bracketing samples 460-23155-16 and -23 exhibited positive results for chromium (Cr) and vanadium (V) which exceeded respective element MDL values (but were <RL values). Positive Cr results in both bracketed samples were <10x CCB values; V results were >10x CCB values.

- QA Action: Qualify Cr results in associated samples 460-23155-16 and -23 as estimated 'J', with indication of potential high bias due to instrument blank contamination

The recovery for antimony in the matrix spike of sample 108_E018_2.5 (Lab ID# 460-23166-12) was below the limit of 75%, at 26%. This batch QC sample affects 460-231555-1 and is from the same site. The associated LCS recovery for Sb was within acceptable limits, indicating analytical process control.

- *QA Action: Qualify Sb result in associated sample 460-23155-1 as estimated, 'UJ' or 'J', with indication of low bias due to sample matrix effects.*

It is noted that no post-digestion spike samples were reported for this delivery group. Serial dilution samples were reported; no results in these samples exceeded the applicable threshold for calculation of percent difference.

No positive element results were reported for the field blank sample (FB021611).

SECTION E
pH / Eh (ORP)

Samples for pH analysis were analyzed outside the method-defined holding-time of 15 minutes, which is essentially a 'field-performed' analysis. The laboratory assigned all reported pH results an 'HF' qualifier flag to indicate this exception. Since the samples were chilled on receipt at the lab, and analyzed within one day of receipt, no data validation qualifiers were assigned.

Calibrations for pH analysis were acceptable, as were required QC criteria (sample duplicates). Standard mV solution checks for Eh (Light's solution) were within acceptable ranges, as were sample duplicate measurements.

Reported pH and eH (ORP) values and resulting ReDox (reducing or oxidizing) characteristics were randomly verified from the $HCrO_4$- / $Cr(OH)_3$ phase diagram; no disparities relative to reported values and characteristics were found. These values are only used for data assessment purposes when Cr^{+6} sample spike recoveries are outside acceptable recovery ranges.

SECTION F
COLLOCATED SAMPLES

REP021611-1 and -2 were identified as being collocated with 108_C018_6.5 and 108_F016_10.0 (460-23155-3 and -8), respectively. Precision results (as %RPD) are tabulated below. Note: ND = Not Detected ; nc = not calculated ; * = absolute difference is shown if either sample <5x CRQL

	C018_6.5	R021611-1	%RPD	F016_10.0	R021611-2	%RPD
Chromium	16.6	15.8	4.9	19.1	14.4	28.1
Nickel	11.8	12.6	0.8 *	14.0	11.9	2.1 *
Antimony	ND	ND	nc	ND	ND	nc
Thallium	ND	ND	nc	ND	ND	nc
Vanadium	21.5	22.1	0.6 *	27.7	19.3	8.4 *
Cr (VI)	ND	ND	nc	ND	ND	nc

The NJDEP DV guidance protocols do not provide qualification thresholds for field duplicate precision values; however, EPA Region II data validation guidance (SOP No. HW-2, Rev. 13, Sept. 2006) provides for a qualification range of >35%, <120% RPD for soils >5x CRQL values, and difference >2x CRQL if either sample is <5x CRQL. No QA action is necessary based on the above field duplicate precision results.

SECTION G
Overall Recommendations

The results of the review and validation process for the above analytical fractions and associated samples are summarized on the attached standard-format NJDEP Data Validation Report Forms, in order to facilitate the end-user's' review of these data.

Very truly yours,
Environmental Quality Associates, Inc.

Chris W. Taylor
Vice President

SW-846 INORGANICS-1

DATA DELIVERABLE REQUIREMENTS

Site Name___**PPG SITE 108**_____ Lab Job No. _**460-23155-1**_____

Location____**NJ**_____ Date of Review___**06/02/2011**_____

Laboratory Name__**TestAmerica Edison**___ Client_**Dresdner-Robin Environmental**___

Reviewer___**C. Taylor / EQA, Inc.**_____ Client Contact__**Douglas Neumann**____

GENERAL REQUIREMENTS: Circle YES or NO and list the deviations at the bottom:

A. Permanently Bound	[N/A]	G. Methodology Review	[Yes] No
B. Paginated	[Yes] No	H. Uninitialed Strikeovers	Yes [No]
C. Title Page	[Yes] No	I. Legible Photocopies	[Yes] No
D. Table of Contents	[Yes] No	J. Consistent Dates	[Yes] No
E. Chain of Custody	[Yes] No	K. Digestion Log	[Yes] No
F. Non-conformance Summa	[Yes] No		

Describe any deviations from the requirements

SW-846 INORGANICS-2

HOLDING TIMES FOR METALS

Matrix: Aqueous ( ) or Nonaqueous (X)

SAMPLE LAB ID 460-23155-	SAMPLE FIELD ID 108_	DATE of SAMPLE COLLECTION	ICP ANALYSIS DATE	HOLDING TIME EXCEEDED
1	C018_0.0	02/16/11	02/23/11	NO
2	C018_2.5	02/16/11	02/23/11	NO
3	C018_6.5	02/16/11	02/23/11	NO
4	C018_9.5	02/16/11	02/23/11	NO
5	F016_0.0	02/16/11	02/23/11	NO
6	F016_2.0	02/16/11	02/23/11	NO
7	F016_6.0	02/16/11	02/23/11	NO
8	F016_10.0	02/16/11	02/23/11	NO
9	H016_0.0	02/16/11	02/23/11	NO
10	H016_2.0	02/16/11	02/23/11	NO
11	H016_6.0	02/16/11	02/23/11	NO
12	H016_10.0	02/16/11	02/23/11	NO
13	M014_0.0	02/16/11	02/23/11	NO
14	M014_10.0	02/16/11	02/23/11	NO
15	M014_15.0	02/16/11	02/23/11	NO
16	M014_19.0	02/16/11	02/22/11	NO
17	REP021611-2	02/16/11	02/23/11	NO
18	M016_0.0	02/16/11	02/23/11	NO
19	M016_3.5	02/16/11	02/23/11	NO
20	M016_5.5	02/16/11	02/23/11	NO
21	M016_9.5	02/16/11	02/23/11	NO
22	M016_13.5	02/16/11	02/23/11	NO
23	M016_REP021611-1	02/16/11	02/22/11	NO
24	FB021611	02/16/11	02/23/11	NO

COMMENTS_____ COOLER TEMP_2.5°C__

_____ PRESERVATION_FB

PH<2_

SW-846 INORGANICS-3

INSTRUMENT CALIBRATION, INITIAL CALIBRATION CHECK (ICC) and INITIAL CALIBRATION VERIFICATION (ICV)

ASSOCIATED SAMPLES __All SDG samples.

1. Was the ICP instrument (6010B) properly standardized? [Yes] No N/A

   If no, explain and list action. _____

2. Was the ICV/ICC analyzed immediately after the systems were calibrated? [Yes] No

   If no, explain and list action._____

3. Was the ICV/ICC analyzed for every analyte? [Yes] No

   If no, explain and list action._____

4. Do all ICV/ICC analytes meet the QC requirements for % recovery? [Yes] No

   If no, list affected analytes, their % recovery, associated samples, and action.

5. Show calculation for the % recovery of one ICV analyte analyzed by ICP.

   Analyte__Sb_ ICV460-65462/5 Lab Value__94%____

Raw conc.: 935.9 ug/L	ICV 02/22/11	17:09	Lab value:	94	%
True conc.: 1000 ug/L					
	Calculated recovery = Raw conc./True conc.=			**93.6**	%

6. SPECIFIC COMMENTS_____

_____

_____

_____

CONTINUING CALIBRATION VERIFICATION (CCV) and CALIBRATION CHECK STANDARD (CCS)

ASSOCIATED SAMPLES __All SDG samples.

_____

_____

_____

_____

1. a. Was the CCV/CCS performed at the minimum frequency of 10%? [Yes] No

If no, list action._____

b. Was the CCV/CCS performed after ten samples and at the end of sample analysis? [Yes] No

If no, list action._____

2. Were the CCV/CCS standards analyzed for all analytes? [Yes] No

If no, list affected analytes, their associated samples and action.

_____

_____

3. Was the CCV/CCS concentration near the midpoint of the calibration curve?

[Yes] No

If no, list affected analytes, their associated samples and action.

_____

_____

4. Do all CCV/CCS analytes meet the QC requirement for % recovery? [Yes] No

If no, list affected analytes, their associated samples and action.

_____

_____

_____

CONTINUING CALIBRATION VERIFICATION (CCV) and CALIBRATION CHECK STANDARD (CCS)

5. Show calculation for the % recovery of one CCV analyte analyzed by ICP.

Analyte __V___CCV 460-65462/74 Lab value _94%_____

Raw conc.:	2341	ug/L	CCV 02/23/11	07:47	Lab value:	94	%
True conc.:	2500	ug/L	Calculated recovery = Raw conc./True conc.=			**93.6**	%

6. SPECIFIC COMMENTS_____

_____

_____

_____

SW-846 INORGANICS-6

METHOD BLANK SUMMARY

Method Blank ID__MB460-65128/1-A^2_____ Sample matrix: [Soil] Water

__MB460-65126/1-A^2_____ Units: [mg/kg] ug/L

__MB460-65136/1-A^2_____

Did the frequency of the method blank analysis meet method requirements? [Yes] No

If no, explain and note action

_____

_____

_____

ANALYTE	CONCENTRATION	<MDL	COMMENTS / ACTION
Cr, Ni, Sb, Tl, V	U		n/a

ASSOCIATED SAMPLES ___All SDG soil samples_____

_____

_____

CALIBRATION BLANKS

ASSOCIATED SAMPLES __All SDG soil samples_____

_____

_____

1. Were the initial calibration blanks analyzed for all analytes and run after the ICV/ICC?

   Yes No

   If no, list affected analytes, and action. _____

   _____

2. Was the absolute value for all analytes in the calibration blank below the MDL?

   Yes No

   If no, list affected analytes and qualify them.

   Cr and V results in CCBs bracketing samples 460-23155-16 and 23 were >MDL, <RL values. Cr response in both bracketed samples were <10x CCB response, and were qualified as estimated 'J', with indication of potential high bias due to instrument blank contamination.

3. Were the continuing calibration blanks analyzed for all analytes and run after the CCV/CCS?

   Yes No

   If no, list affected analytes, associated samples and action. _____

   _____

4. Was the frequency for the continuing calibration blanks correct? Yes No

   If no, list affected analytes, associated samples and action._____

   _____

ICP INTERFERENCE CHECK SAMPLE

ASSOCIATED SAMPLES __All SDG samples_____

_____

_____

1. Was an ICP interference check sample performed at the correct frequency?

Yes No

If no, note any deviations and action._____

_____

2. Were the analytes interest and interferents for ICS reported? Yes No

If no, note deviations._____

3. Did all the required analytes of interest in the ICS meet the QC limit of 80-120%?

Yes No

If no, list the analytes, the % recovery, associated samples and the action.___

_____

4. Show the calculation for the % recovery for one analyte in the ICS.

Analyte _ Ni___ICSAB ID:__460-65462/83___ Lab value _91%_____

Raw conc.: 91.0 ug/L	Lab value: 91 %

True conc.: 100 ug/L

Calculated recovery = Raw conc./True conc.= **91.0** %

5. COMMENTS_____

_____

_____

SW-846 INORGANICS-10

MATRIX SPIKE (MS) and MATRIX SPIKE DUPLICATE (MSD)

Part 1 of 2

Spike Analysis performed on sample __108_M014_15.0 MS____ % Solids__85.8___
(460-23155-15 MS)

Sample matrix: [Soil] Water

Units: [mg/kg] ug/L

ASSOCIATED SAMPLES __460-23155-2 through -15, and -17 through -22. Samples 23155-16 and -23 were associated with a batch matrix spike which was not from this SDG or this site. Sample 460-23155-1 was analyzed in a single-sample batch and used for batch QC.

1. Was the MS/MSD performed at the correct frequency?

[Yes] No

If no, note deviations and action _____

_____

_____

2. Was the MS/MSD analyses performed on a field sample?

[Yes] No

If no, reject all associated samples._____

3. a. Were two (2) analytical methods used to obtain reported values for one analyte (i.e., ICP and AA) ?

Yes [No]

If yes, list analytes _____

_____

_____

b. Was MS/MSD analysis performed using both methods for that analyte?

[N/A]

If no, reject affected sample(s) which did not have spike analysis performed.

MATRIX SPIKE (MS) and MATRIX SPIKE DUPLICATE (MSD)

4. Did the % recovery for all analytes meet the criteria of 75-125 %?

   [Yes] No

   If no, list % recovery in parenthesis next to the analyte out and action.

   _____

   ACTION: n/a

5. Did the Relative Percent Difference (RPD) for all analytes meet the requirement of 20% RPD?

   [Yes] No N/A

   If no, list analytes and action. _

   QA Action: n/a_____

6. a. Show calculation for % recovery for one analyte.

   Analyte __Sb___ (460-23155-15 MS) Lab value __87%__

Spike Added:	56.6		(spike - sample) x 100		
Spike conc:	49.4	% rec. =	spike added	=	**87.3** %
Sample conc:	2.3 U				

   b. Show calculation for % RPD for one analyte.

   Analyte __Cr___ (460-23155-15 DU) Lab value _17% RPD

Sample :	13.7		|Sample - Duplicate| x 100		
Duplicate:	16.3	% RPD =	(Sample + Duplicate) / 2	=	**17.3** %RPD

SW-846 INORGANICS-13

POST-DIGESTION SPIKE ANALYSIS

Post Digestion Spike Analysis performed on sample __PDS was not reported_____

Sample matrix: Soil Water % Solids_____

Units: mg/kg ug/L

ASSOCIATED SAMPLES

_____

_____

_____

_____

_____

1. Was post-digestion spike analysis performed at the correct frequency? Yes No

   If no, list the analyte(s) and action.

   _____

_____

   _____

_____

2. Was post-digestion spike performed on a field sample? Yes No
   If no, list analytes and qualify them.

   _____

_____

   _____

_____

3. List the analyte(s), and their % recovery where post-digestion spike analysis was performed but still did not meet the QC criteria and action. N/A

   _____

_____

   _____

_____

4. Show the calculation for % recovery for at least one analyte where post-digestion spike analysis was performed.

   Analyte _____ Lab value _____

5. Comments: No PDS were reported for this SDG; the associated LCS recoveries and Serial Dilution sample %D precision values were within applicable limits. No data qualifiers were assigned due to the absence of a PDS sample.

LABORATORY CONTROL SAMPLE (LCS)

Sample matrix: [Soil] [Water]

Units: [mg/kg] [ug/L]

ASSOCIATED SAMPLES _All SDG samples._____

_____

_____

_____

_____

1. Was the laboratory control sample performed at the correct frequency? [Yes] No

If no, give action. _____

_____

_____

2. Do all analytes meet the QC limits of 80-120 %? [Yes] No

If no, list analytes, their % recovery and action. _____

3. Show the calculation for % recovery for one analyte.

Analyte _V_ LCS SRM 460-65128/2-A Lab Value _ 111.5_ (99%)

Soil limits _67.6 - 132_

LCS Raw Value : 111.5 mg/Kg
LCS True Value : 113 mg/Kg

$$\text{LCS \% recovery} = \frac{\text{LCS Raw Value} \times 100}{\text{LCS True Value}} = \boxed{\mathbf{98.7}}\ \%$$

4. Comments: The LCSS "True Values" listed for Cr and Ni on Form 7A-IN were 236 and 134 mg/Kg. However, the acceptable concentration ranges were listed as 70.8 to 129 and 73.2 to 127 mg/Kg, respectively. Actual found concentrations were very close to the listed true values for Cr and Ni. The acceptable recovery ranges for these elements are presumed to be incorrectly listed.

SERIAL DILUTION ANALYSIS

Serial Dilution performed on samples __108 M014_15.0 ___ Dilution Factor 4 ; 20__

Sample matrix: [Soil] Water Units: [mg/kg] ug/L

ASSOCIATED SAMPLES __All SDG soil samples _____

_____

_____

1. Was a serial dilution performed at the correct frequency? [Yes] No

   If no, give action_____

2. Was a field sample used for serial dilution? [Yes] No

   If no, give action_____

3. For all analytes greater than ten times the IDL after dilution for 6010B and 25 times the EDL for 7000A methods, was a serial dilution performed?

   [n/a] No

   If no, list analytes and reject them. _____

4. For all analytes that needed serial dilution analysis, was the QC limit of 10 % D met? [n/a] No

   If no, list those analytes outside the limits and qualify them. _____

5. Show calculation for % D for one analyte analyzed by ICP.

   Analyte __Cr_____ Lab value _NC_

Sample value :	13.7
Serial Dilution value :	15.0

$$\text{Serial Dilution \% D} = \frac{(\text{Sample} - \text{Serial Dilution}) \times 100}{\text{Sample value}} = \boxed{\textbf{NC}} \ \% \text{ D}$$

Note: NC = Not Calculated; sample result <50x MDL (IDL) before dilution

METHOD OF STANDARD ADDITION (MSA)

ASSOCIATED SAMPLES ____MSA was not necessary._____

_____

_____

_____

1. If the post digestion spike recovery for Methods 7000A was outside the QC limit, was the MSA performed?

   Yes No N/A

   If no, explain and list action.

_____

_____

_____

2. Was the MSA within the linear range of the instrument? Yes No N/A

   If no, explain and list action.

_____

_____

_____

3. Was the MSA sample and spikes analyzed consecutively? Yes No N/A

   If no, explain and list action.

_____

_____

_____

4. Was the slope of the MSA plot less than 20% difference of the slope of the standard curve? Yes No N/A

   If no, explain and list action.

_____

_____

_____

SW-846 INORGANICS-19

5. Comments:

SW-846 INORGANICS-20

SAMPLE RESULT VERIFICATION

ASSOCIATED SAMPLES ___All SDG samples._____

1. Were all sample results reported within the calibration range? [Yes] No

   If no, list affected samples and action.

   _____

2. Was the raw data free of any anomalies? [Yes] No

   If no, list affected samples and action.

   _____

3. Was the data package free of any computational or transcription errors?

   Yes [No]

   If no, list affected samples and action. *Sample 460-23155-1 (and its MS, DU and SD) exhibited incorrectly reported Result, RL, MDL and Units values, as raw concentration values in mg/L, rather than as mg/Kg dry-weight values. Therefore, the reported values are under-reported by a nominal factor of 50x in both the laboratory report and the associated EDD results summary.*

4. Was the % solids analysis performed for all nonaqueous samples?

   [Yes] No N/A

   If no, list affected samples and action.

   _____

5. Show the calculation for % solids for one sample. Lab value __97.0%_____
   Sample ID: _108_C018_0.0 (460-23155-1)

Dry weight :	5.42	gm		Dry weight	x 100		
Wet weight :	5.59	gm	% Solids =	Wet weight	=	**97.0**	%

6. Verify that nonaqueous samples were reported on a dry weight basis by recalculating the result for one analyte in a sample.

   Sample _108_C018_0.0_ Analyte __Cr__ Lab value _0.74 mg/Kg_

Raw value	0.1785	mg/L	Dilution =	4.0			
Final vol.	50	mL	% Solids =	97.0	mg/L x FV (ml) x Dil'n.		
Wet wgt.	1.0	gm	mg/Kg dry weight =		wet wgt x (%Sol/100) =	**36.8**	mg/ kg

02 June, 2011

Dresdner-Robin Environmental Management
Att: Mr. Douglas Neumann, Director
371 Warren Street
Jersey City, New Jersey 07302

Re: PPG – Site 108, Laboratory Job No. 460-23196-1

Dear Mr. Neumann,

This cover letter, and the attached documents, detail the data validation findings associated with the following sample analytical results contained in the above-referenced deliverables set:

Site Name: PPG – Site 108

Fractions
Hexavalent chromium (Cr^{+6})
Total Metals (Cr, Ni, Sb, Tl, V)
pH / Eh ; ORP

Laboratory: TestAmerica Laboratories, Inc.

Report No.: 460-23196-1

Matrix: Non-Aqueous

Reviewer: Chris Taylor

Prepared By: Environmental Quality Associates, Inc.
487 Shoddy Hollow Road
Middletown, New York 10940

SECTION A
Sample Information

The above-noted laboratory Job Number samples were analyzed by TestAmerica Laboratories, Inc., Edison, NJ (NJ Laboratory ID Cert. No. 12028). Hexavalent chromium (Cr^{+6}) samples were prepared and analyzed using USEPA SW-846 methods 3060A and 7196A. Total metals samples were prepared and analyzed using USEPA SW-846 methods 3050B (3010A for aqueous samples) and 6010B. Oxidation / Reduction Potential (ORP) characteristics were determined by measurement of pH / Eh values for samples and subsequent extrapolation against the $HCrO_4$- / $Cr(OH)_3$ phase diagram; pH and Eh values were measured by Standard Methods 4500H-B and 2580B, respectively.

A summary table of samples analyzed is presented below. Please note that the number of 'Total Samples' listed below is exclusive of associated QC samples (MS / MD).

Sample ID 108_	Lab ID 460-23196-	Matrix	Date Collected	Analysis	
				Hex Cr	Metals
L014_0.0	1	S	02/17/11	X	X
L014_3.5	2	S	02/17/11	X	X
L014_7.5	3	S	02/17/11	X	X
L014_11.5	4	S	02/17/11	X	X
L014_14.5	5	S	02/17/11	X	X
L014_18.5	6	S	02/17/11	X	X
REP021711-3	7	S	02/17/11	X	X
FB021711	8	A	02/17/11	X	X
L012_0.0	9	S	02/17/11	X	X
L012_3.5	10	S	02/17/11	X	X
L012_5.5	11	S	02/17/11	X	X
L012_9.5	12	S	02/17/11	X	X
REP021711-2	13	S	02/17/11	X	X
M012_0.0	14	S	02/17/11	X	X
M012_3.5	15	S	02/17/11	X	X
M012_5.5	16	S	02/17/11	X	X
M012_9.5	17	S	02/17/11	X	X
M012_13.5	18	S	02/17/11	X	X
F003_0.0	19	S	02/17/11	X	X
F003_2.5	20	S	02/17/11	X	X
F003_4.5	21	S	02/17/11	X	X
F003_8.5	22	S	02/17/11	X	X
F003_12.5	23	S	02/17/11	X	X
M010_0.0	24	S	02/17/11	X	X
M010_2.0	25	S	02/17/11	X	X
M010_6.0	26	S	02/17/11	X	X
M010_10.0	27	S	02/17/11	X	X
M010_REP021711-1	28	S	02/17/11	X	X
C004_0.0	29	S	02/17/11	X	X
C004_3.5	30	S	02/17/11	X	X
C004_6.5	31	S	02/17/11	X	X
C004_10.5	32	S	02/17/11	X	X
C004_14.5	33	S	02/17/11	X	X
M008_0.0	34	S	02/17/11	X	X
M008_4.5	35	S	02/17/11	X	X
M008_8.5	36	S	02/17/11	X	X
M008_12.5	37	S	02/17/11	X	X

S = Non-Aqueous Matrix
A = Aqueous Matrix

Total Samples = 37
Bold Type indicates sample taken as a Batch QC sample

All samples were received one day from collection. Samples were received on ice at recorded temperature of 3.8°C.

SECTION C
Hexavalent Chromium

Holding times from sample collection to analysis (≤24 hours for aqueous matrix; ≤30 days for non-aqueous matrix) were met for all samples.

All calibration criteria were met for this sample group, including: initial calibration linearity and continuing calibration frequency and accuracy. Method and calibration blanks for soils were free of contamination. Reported spike recoveries, duplicate precision values, reported % moisture (% solids) and reported Cr^{+6} results were randomly verified from the raw data with no disparities between reported and calculated results found.

No positive Cr^{+6} result was reported for the field blank sample (FB021711).

SECTION D
Total Metals

Holding times from sample collection to analysis were met for all total metals samples.

Calibration and QC criteria were met for this sample group, including: initial calibration linearity, continuing calibration frequency and accuracy, blanks, interference checks, matrix spike recoveries, duplicate precision, LCS recoveries and serial dilution sample precision. Reported spike recoveries, duplicate precision values, reported % moisture (% solids) were randomly verified from the raw data with no disparities between reported and calculated results found.

It is noted that no post-digestion spike samples were reported for this delivery group. Serial dilution samples were reported; no results in these samples exceeded the applicable threshold for calculation of percent difference.

No positive element results were reported for the field blank sample (FB021711).

SECTION E
pH / Eh (ORP)

Samples for pH analysis were analyzed outside the method-defined holding-time of 15 minutes, which is essentially a 'field-performed' analysis. The laboratory assigned all reported pH results an 'HF' qualifier flag to indicate this exception. Since the samples were chilled on receipt at the lab, and analyzed within one day of receipt, no data validation qualifiers were assigned.

Calibrations for pH analysis were acceptable, as were required QC criteria (sample duplicates). Standard mV solution checks for Eh (Light's solution) were within acceptable ranges, as were sample duplicate measurements.

Reported pH and eH (ORP) values and resulting ReDox (reducing or oxidizing) characteristics were randomly verified from the $HCrO_4$- / $Cr(OH)_3$ phase diagram; no disparities relative to reported values and characteristics were found. These values are only used for data assessment purposes when Cr^{+6} sample spike recoveries are outside acceptable recovery ranges.

SECTION F
COLLOCATED SAMPLES

REP021711-1, -2 and -3 were identified as being collocated with 108_M008_8.5, 108_C004_10.5 and 108_F003_4.5 (460-23196-36, -32 and -21), respectively. Precision results (as %RPD) are tabulated below. Note: ND = Not Detected ; nc = not calculated ; * = absolute difference is shown if either sample <5x CRQL

	M008_8.5	R021711-1	%RPD	C004_10.5	R021711-2	%RPD	F003_4.5	R021711-3	%RPD
Chromium	15.6	17.9	13.7	15.7	15.8	0.6	18.4	24.3	27.6
Nickel	14.8	14.7	0.1 *	13.5	13.1	0.4 *	10.5	15.4	4.9 *
Antimony	ND	ND	nc	ND	ND	nc	ND	ND	nc
Thallium	ND	ND	nc	ND	ND	nc	ND	ND	nc
Vanadium	18.7	22.9	4.2 *	24.3	23.6	0.7 *	21.7	37.4	15.7 *
Cr (VI)	ND	0.60 J	0.60 *	ND	ND	nc	0.56 J	ND	0.56 *

The NJDEP DV guidance protocols do not provide qualification thresholds for field duplicate precision values; however, EPA Region II data validation guidance (SOP No. HW-2, Rev. 13, Sept. 2006) provides for a qualification range of >35%, <120% RPD for soils >5x CRQL values, and difference >2x CRQL if either sample is <5x CRQL. No QA action is necessary based on the above field duplicate precision results.

SECTION G
Overall Recommendations

The results of the review and validation process for the above analytical fractions and associated samples are summarized on the attached standard-format NJDEP Data Validation Report Forms, in order to facilitate the end-user's' review of these data.

Very truly yours,
Environmental Quality Associates, Inc.

Chris W. Taylor
Vice President

SW-846 INORGANICS-1

DATA DELIVERABLE REQUIREMENTS

Site Name___**PPG SITE 108**_____ Lab Job No. _**460-23196-1**_____

Location____**NJ**_____ Date of Review___**06/02/2011**_____

Laboratory Name__**TestAmerica Edison**___ Client_**Dresdner-Robin Environmental**___

Reviewer___**C. Taylor / EQA, Inc.**_____ Client Contact__**Douglas Neumann**____

GENERAL REQUIREMENTS: Circle YES or NO and list the deviations at the bottom:

A. Permanently Bound	N/A	G. Methodology Review	Yes No
B. Paginated	Yes No	H. Uninitialed Strikeovers	Yes No
C. Title Page	Yes No	I. Legible Photocopies	Yes No
D. Table of Contents	Yes No	J. Consistent Dates	Yes No
E. Chain of Custody	Yes No	K. Digestion Log	Yes No
F. Non-conformance Summa	Yes No		

Describe any deviations from the requirements

SW-846 INORGANICS-2

HOLDING TIMES FOR METALS

Matrix: Aqueous ( ) or Nonaqueous (X)

SAMPLE LAB ID 460-23196-	SAMPLE FIELD ID 108_	DATE of SAMPLE COLLECTION	ICP ANALYSIS DATE	HOLDING TIME EXCEEDED
1	L014_0.0	02/17/11	02/25/11	NO
2	L014_3.5	02/17/11	02/25/11	NO
3	L014_7.5	02/17/11	02/25/11	NO
4	L014_11.5	02/17/11	02/25/11	NO
5	L014_14.5	02/17/11	02/25/11	NO
6	L014_18.5	02/17/11	02/25/11	NO
7	REP021711-3	02/17/11	02/25/11	NO
8	FB021711	02/17/11	02/23/11	NO
9	L012_0.0	02/17/11	02/24/11	NO
10	L012_3.5	02/17/11	02/24/11	NO
11	L012_5.5	02/17/11	02/24/11	NO
12	L012_9.5	02/17/11	02/24/11	NO
13	REP021711-2	02/17/11	02/24/11	NO
14	M012_0.0	02/17/11	02/24/11	NO
15	M012_3.5	02/17/11	02/24/11	NO
16	M012_5.5	02/17/11	02/24/11	NO
17	M012_9.5	02/17/11	02/24/11	NO
18	M012_13.5	02/17/11	02/24/11	NO
19	F003_0.0	02/17/11	02/24/11	NO
20	F003_2.5	02/17/11	02/24/11	NO
21	F003_4.5	02/17/11	02/24/11	NO
22	F003_8.5	02/17/11	02/24/11	NO
23	F003_12.5	02/17/11	02/24/11	NO
24	M010_0.0	02/17/11	02/24/11	NO
25	M010_2.0	02/17/11	02/24/11	NO
26	M010_6.0	02/17/11	02/24/11	NO
27	M010_10.0	02/17/11	02/24/11	NO
28	M010_REP021711-1	02/17/11	02/23/11	NO
29	C004_0.0	02/17/11	02/24/11	NO
30	C004_3.5	02/17/11	02/24/11	NO
31	C004_6.5	02/17/11	02/24/11	NO
32	C004_10.5	02/17/11	02/24/11	NO
33	C004_14.5	02/17/11	02/24/11	NO
34	M008_0.0	02/17/11	02/24/11	NO
35	M008_4.5	02/17/11	02/24/11	NO

SAMPLE LAB ID	SAMPLE FIELD ID	DATE of SAMPLE	ICP ANALYSIS	HOLDING TIME

SW-846 INORGANICS-3

460-23196-	108_	COLLECTION	DATE	EXCEEDED
36	M008_8.5	02/17/11	02/24/11	NO
37	M008_12.5	02/17/11	02/24/11	NO

COMMENTS_____

_____

_____

COOLER

TEMP_3.8^{O}C__

PRESERVATION_FB PH<2_

SW-846 INORGANICS-4

INSTRUMENT CALIBRATION, INITIAL CALIBRATION CHECK (ICC) and INITIAL CALIBRATION VERIFICATION (ICV)

ASSOCIATED SAMPLES __All SDG samples.

1. Was the ICP instrument (6010B) properly standardized? [Yes] No N/A

   If no, explain and list action. _____

2. Was the ICV/ICC analyzed immediately after the systems were calibrated? [Yes] No

   If no, explain and list action._____

3. Was the ICV/ICC analyzed for every analyte? [Yes] No

   If no, explain and list action._____

4. Do all ICV/ICC analytes meet the QC requirements for % recovery? [Yes] No

   If no, list affected analytes, their % recovery, associated samples, and action.

5. Show calculation for the % recovery of one ICV analyte analyzed by ICP.

   Analyte__Sb_____ (ICP2; ICV 460-65559/5) Lab Value__94%____

Raw conc.:	938.3	ug/L	ICV 02/23/11	18:20	Lab value:	94 %
True conc.:	1000	ug/L				
			Calculated recovery = Raw conc./True conc.=			**93.8** %

6. SPECIFIC COMMENTS:_____

_____

_____

CONTINUING CALIBRATION VERIFICATION (CCV) and CALIBRATION CHECK STANDARD (CCS)

ASSOCIATED SAMPLES __All SDG samples.

_____

_____

_____

_____

1. a. Was the CCV/CCS performed at the minimum frequency of 10%? Yes No

If no, list action._____

b. Was the CCV/CCS performed after ten samples and at the end of sample analysis? Yes No

If no, list action._____

2. Were the CCV/CCS standards analyzed for all analytes? Yes No

If no, list affected analytes, their associated samples and action.

_____

_____

3. Was the CCV/CCS concentration near the midpoint of the calibration curve?

Yes No

If no, list affected analytes, their associated samples and action.

_____

_____

4. Do all CCV/CCS analytes meet the QC requirement for % recovery? [Yes] No

If no, list affected analytes, their associated samples and action.

_____

_____

_____

CONTINUING CALIBRATION VERIFICATION (CCV) and CALIBRATION CHECK STANDARD (CCS)

5. Show calculation for the % recovery of one CCV analyte analyzed by ICP.

Analyte __V____ (ICP2 ; CCV 460-65559/82) Lab value _98%_____

Raw conc.:	2449	ug/L	CCV 02/14/11 20:28	Lab value: 98	%
True conc.:	2500	ug/L	Calculated recovery = Raw conc./True conc.=	**98.0**	%

6. SPECIFIC COMMENTS_____

_____

_____

_____

SW-846 INORGANICS-7

METHOD BLANK SUMMARY

Method Blank ID__MB460-65150/1-A^2_____ Sample matrix: [Soil] Water

__MB460-65488/1-A^2_____ Units: [mg/kg] ug/L
__MB460-65490/1-A^2_____
__MB460-65149/1-A^2_____

Did the frequency of the method blank analysis meet method requirements? [Yes] No

If no, explain and note action
_____

_____

_____

ANALYTE	CONCENTRATION	<MDL	COMMENTS / ACTION
Cr, Ni, Sb, Tl, V	U		n/a

ASSOCIATED SAMPLES ___All SDG soil samples_____

_____

_____

CALIBRATION BLANKS

ASSOCIATED SAMPLES __All SDG soil samples_____

_____

_____

1. Were the initial calibration blanks analyzed for all analytes and run after the ICV/ICC?

   [Yes] No

   If no, list affected analytes, and action. _____

   _____

2. Was the absolute value for all analytes in the calibration blank below the MDL?

   Yes [No]

   If no, list affected analytes and qualify them. *Tl in ICB and CCBs bracketing samples 460-23196-34 through -37 was >MDL, <RL. However all bracketed samples were non-detect (U) for Tl; no QA action necessary.*

3. Were the continuing calibration blanks analyzed for all analytes and run after the CCV/CCS?

   [Yes] No

   If no, list affected analytes, associated samples and action. _____

   _____

   _____

4. Was the frequency for the continuing calibration blanks correct? [Yes] No

   If no, list affected analytes, associated samples and action._____

   _____

ICP INTERFERENCE CHECK SAMPLE

ASSOCIATED SAMPLES __All SDG samples_____

_____

_____

1. Was an ICP interference check sample performed at the correct frequency?

Yes No

If no, note any deviations and action._____

_____

2. Were the analytes interest and interferents for ICS reported? Yes No

If no, note deviations._____

3. Did all the required analytes of interest in the ICS meet the QC limit of 80-120%?

Yes No

If no, list the analytes, the % recovery, associated samples and the action.___

_____

4. Show the calculation for the % recovery for one analyte in the ICS.

Analyte _ Ni_____ ICSAB ID:__460-65559/81___ Lab value _89%_____

Raw conc.: 88.8 ug/L	Lab value: 89 %
True conc.: 100 ug/L	

Calculated recovery = Raw conc./True conc.=	**88.8**	%

5. COMMENTS_____

_____

_____

SW-846 INORGANICS-11

MATRIX SPIKE (MS) and MATRIX SPIKE DUPLICATE (MSD)

Part 1 of 2

Spike Analysis performed on sample __108_M010_REP-1 MS____ % Solids__89.0___
(460-23196-28 MS)

Sample matrix: [Soil] Water

Units: [mg/kg] ug/L

ASSOCIATED SAMPLES: 460-23196-9 through -28. Recoveries for 23196-28 were acceptable. All other SDG samples were associated with batch matrix spikes which were not from this SDG and not from this site. No QA action was considered for other samples (-1 through -7; -29 through -37), since these batch spikes' matrix may not be representative of this SDG's matrix characteristics.

1. Was the MS/MSD performed at the correct frequency?

[Yes] No

If no, note deviations and action _____

_____

_____

2. Was the MS/MSD analyses performed on a field sample?

[Yes] No

If no, reject all associated samples._____

3. a. Were two (2) analytical methods used to obtain reported values for one analyte (i.e., ICP and AA) ?

Yes [No]

If yes, list analytes _____

_____

_____

b. Was MS/MSD analysis performed using both methods for that analyte?

[N/A]

If no, reject affected sample(s) which did not have spike analysis performed.

SW-846 INORGANICS-13

MATRIX SPIKE (MS) and MATRIX SPIKE DUPLICATE (MSD)

4. Did the % recovery for all analytes meet the criteria of 75-125 %?

Yes [No]

If no, list % recovery in parenthesis next to the analyte out and action.

_23173-3 Cr (889%), V (159%) samples -1 through -7
_23286-5 Sb (61%) samples -29 through -33

ACTION: n/a ; see Comments below.

COMMENTS: The above-noted QC batch samples were not from this SDG or site, and the results were not considered for qualification, since these samples may not be representative of this SDG's sample matrix characteristics.

5. Did the Relative Percent Difference (RPD) for all analytes meet the requirement of 20% RPD? [Yes] No N/A

COMMENTS: One batch Duplicate (460-23173-3 DU) was reported with Cr outside limits; this sample was not from this SDG or site, and the resultswere not considered for qualification, since this sample may not be representative of this SDG's sample matrix characteristics.

Duplicate results were evaluated on either %RPD or absolute difference, as applicable, based on concentration.

a. Show calculation for % recovery for one analyte.

Analyte __Sb __ (460-23196-28 MS) Lab value __90%__

Spike Added: 56.2
Spike conc: 50.6
Sample conc: 2.2 U

$$\%\ rec. = \frac{(spike - sample) \times 100}{spike\ added} = \mathbf{90.0}\ \%$$

b. Show calculation for % RPD for one analyte.

Analyte __Cr___ (460-23196-28 DU) Lab value _5%_ RPD

Sample : 17.9
Duplicate: 17.0

$$\%\ RPD = \frac{|Sample - Duplicate| \times 100}{(Sample + Duplicate) / 2} = \mathbf{5.2}\ \%RPD$$

POST-DIGESTION SPIKE ANALYSIS

Post Digestion Spike Analysis performed on sample __PDS was not reported_____

Sample matrix: Soil Water % Solids_____

Units: mg/kg ug/L

ASSOCIATED SAMPLES

_____

_____

_____

_____

1. Was post-digestion spike analysis performed at the correct frequency? Yes No

   If no, list the analyte(s) and action.

   _____

_____

   _____

_____

2. Was post-digestion spike performed on a field sample? Yes No
   If no, list analytes and qualify them.

   _____

_____

   _____

_____

3. List the analyte(s), and their % recovery where post-digestion spike analysis was performed but still did not meet the QC criteria and action. N/A

   _____

_____

   _____

_____

4. Show the calculation for % recovery for at least one analyte where post-digestion spike analysis was performed.

   Analyte _____ Lab value _____

5. Comments: No PDS were reported for this SDG; the associated LCS recoveries and Serial Dilution sample %D precision values were within applicable limits. No data qualifiers were assigned due to the absence of a PDS sample.

LABORATORY CONTROL SAMPLE (LCS)

Sample matrix: [Soil] [Water]

Units: [mg/kg] [ug/L]

ASSOCIATED SAMPLES _All SDG samples._____

_____

_____

1. Was the laboratory control sample performed at the correct frequency? [Yes] No

If no, give action. _____

_____

2. Do all analytes meet the QC limits of 80-120 %? [Yes] No

If no, list analytes, their % recovery and action. _____

3. Show the calculation for % recovery for one analyte.

Analyte _Cr_ LCS SRM 460-65150/2-A Lab Value _ 236_ (100%)

Soil limits _70.8 – 129 *__

LCS Raw Value : 236.2 mg/Kg
LCS True Value : 236 mg/Kg

$$\text{LCS \% recovery} = \frac{\text{LCS Raw Value} \times 100}{\text{LCS True Value}} = \boxed{100}\ \%$$

4. Comments: * The LCSS "True Values" listed for Cr and Ni on Form 7A-IN were 236 and 134 mg/Kg. However, the acceptable concentration ranges were listed as 70.8 to 129 and 73.2 to 127 mg/Kg, respectively. Actual found concentrations were very close to the listed true values for Cr and Ni. The acceptable recovery ranges for these elements are presumed to be incorrectly listed.

SERIAL DILUTION ANALYSIS

Serial Dilution performed on samples __107_E027_15.5 (460-23077-26) Dilution Factor 4 ; 20__

Sample matrix: [Soil] Water Units: [mg/kg] ug/L

ASSOCIATED SAMPLES __All SDG soil samples

1. Was a serial dilution performed at the correct frequency? [Yes] No

   If no, give action_____

2. Was a field sample used for serial dilution? [Yes] No

   If no, give action_____

3. For all analytes greater than ten times the IDL after dilution for 6010B and 25 times the EDL for 7000A methods, was a serial dilution performed?

   [n/a] No

   If no, list analytes and reject them.

4. For all analytes that needed serial dilution analysis, was the QC limit of 10 % D met? [n/a] No

   If no, list those analytes outside the limits and qualify them. _____

5. Show calculation for % D for one analyte analyzed by ICP.

   Analyte __Cr__ (460-23196-28) Lab value _NC%_

Sample value : 17.9

SW-846 INORGANICS-18

Serial Dilution value : 17.7

$$\text{Serial Dilution \% D} = \frac{\text{(Sample - Serial Dilution) x 100}}{\text{Sample value}} = \boxed{\textbf{NC}} \text{ \% D}$$

Note: NC = Not Calculated; sample result <50x MDL (IDL) before dilution

METHOD OF STANDARD ADDITION (MSA)

ASSOCIATED SAMPLES ____MSA was not necessary._____

_____

_____

_____

1. If the post digestion spike recovery for Methods 7000A was outside the QC limit, was the MSA performed?
   Yes No N/A
   If no, explain and list action.
_____

_____

_____

2. Was the MSA within the linear range of the instrument? Yes No N/A
   If no, explain and list action.
_____

_____

_____

3. Was the MSA sample and spikes analyzed consecutively? Yes No N/A
   If no, explain and list action.
_____

_____

_____

4. Was the slope of the MSA plot less than 20% difference of the slope of the standard curve? Yes No N/A
   If no, explain and list action.
_____

_____

_____

SW-846 INORGANICS-20

5. Comments:

SW-846 INORGANICS-21

SAMPLE RESULT VERIFICATION

ASSOCIATED SAMPLES ___All SDG samples._____

_____

_____

1. Were all sample results reported within the calibration range? [Yes] No

   If no, list affected samples and action.

_____

2. Was the raw data free of any anomalies? [Yes] No

   If no, list affected samples and action.

_____

3. Was the data package free of any computational or transcription errors? [Yes] No

   If no, list affected samples and action.

_____

4. Was the % solids analysis performed for all nonaqueous samples? [Yes] No N/A

   If no, list affected samples and action.

_____

5. Show the calculation for % solids for one sample. Lab value __89.0%_____
   Sample ID: _108_M010_REP021711-1

Dry weight :	4.79	gm		Dry weight	x 100		
Wet weight :	5.38	gm	% Solids =	Wet weight	=	**89.0**	%

6. Verify that nonaqueous samples were reported on a dry weight basis by recalculating the result for one analyte in a sample. N/A

   Sample _108_M010_REP021711-1 Analyte __V__ Lab value _22.9 mg/Kg_

Raw value	0.1022	mg/L	Dilution =	4			
Final vol.	50	mL	% Solids =	89.0	mg/L x FV (ml)		
Wet wght	1.00	gm	mg/Kg dry weight =		wet wgt x (%Sol/100) =	**23.0**	mg/ kg

04 June, 2011

Dresdner-Robin Environmental Management
Att: Mr. Douglas Neumann, Director
371 Warren Street
Jersey City, New Jersey 07302

Re: PPG – Sites 107 & 108, Laboratory Job No. 460-23391-1

Dear Mr. Neumann,

This cover letter, and the attached documents, detail the data validation findings associated with the following sample analytical results contained in the above-referenced deliverables set:

Site Name: PPG – Site 108

Fractions
Hexavalent chromium (Cr^{+6})
Total Metals (Cr, Ni, Sb, Tl, V)
pH / Eh ; ORP

Laboratory: TestAmerica Laboratories, Inc.

Report No.: 460-23391-1

Matrix: Non-Aqueous

Reviewer: Chris Taylor

Prepared By: Environmental Quality Associates, Inc.
487 Shoddy Hollow Road
Middletown, New York 10940

SECTION A
Sample Information

The above-noted laboratory Job Number samples were analyzed by TestAmerica Laboratories, Inc., Edison, NJ (NJ Laboratory ID Cert. No. 12028). Hexavalent chromium (Cr^{+6}) samples were prepared and analyzed using USEPA SW-846 methods 3060A and 7196A. Total metals samples were prepared and analyzed using USEPA SW-846 methods 3050B (3010A for aqueous samples) and 6010B. Oxidation / Reduction Potential (ORP) characteristics were determined by measurement of pH / Eh values for samples and subsequent extrapolation against the $HCrO_4$- / $Cr(OH)_3$ phase diagram; pH and Eh values were measured by Standard Methods 4500H-B and 2580B, respectively.

A summary table of samples analyzed is presented below. Please note that the number of 'Total Samples' listed below is exclusive of associated QC samples (MS / MD).

Site ID	Sample ID	Lab ID 460-23391-	Matrix	Date Collected	Analysis	
					Hex Cr	Metals
107_	D019_0.0	1	S	02/23/11	X	X
107_	D019_4.0	2	S	02/23/11	X	X
107_	D019_8.0	**3**	S	02/23/11	X	X
107_	D019_12.0	4	S	02/23/11	X	X
108_	M018_0.0	5	S	02/23/11	X	X
108_	M018_4.0	6	S	02/23/11	X	X
108_	M018_8.0	7	S	02/23/11	X	X
108_	M018_12.0	**8**	S	02/23/11	X	X
108_	M018_3.5	9	S	02/23/11	X	X
108_	M006_0.0	10	S	02/23/11	X	X
108_	M006_4.0	11	S	02/23/11	X	X
108_	M006_8.0	12	S	02/23/11	X	X
108_	M006_12.0	13	S	02/23/11	X	X
108_	C002_0.0	14	S	02/23/11	X	X
108_	C002_4.0	15	S	02/23/11	X	X
108_	C002_8.0	16	S	02/23/11	X	X
108_	C002_12.0	17	S	02/23/11	X	X
108_	B006_0.0	18	S	02/23/11	X	X
108_	B006_3.5	**19**	S	02/23/11	X	X
108_	B006_7.5	20	S	02/23/11	X	X
108_	B006_11.5	21	S	02/23/11	X	X
107_	REP-022311-1	22	S	02/23/11	X	X
108_	B008_0.0	23	S	02/23/11	X	X
108_	B008_4.5	24	S	02/23/11	X	X
108_	B008_8.5	25	S	02/23/11	X	X
108_	B008_12.5	26	S	02/23/11	X	X
108_	REP-022311-2	27	S	02/23/11	X	X
---	FB022311	28FB	A	02/23/11	X	X

S = Non-Aqueous Matrix Total Samples = 28

A = Aqueous Matrix **Bold Type** indicates sample taken as a Batch QC sample

All samples were received one day from collection. Samples were received on ice at recorded temperature of 3.4°C.

SECTION C
Hexavalent Chromium

Holding times from sample collection to analysis (≤24 hours for aqueous matrix; ≤30 days for non-aqueous matrix) were met for all samples.

All calibration criteria were met for this sample group, including: initial calibration linearity and continuing calibration frequency and accuracy. Method and calibration blanks for soils were free of contamination.

Reported spike recoveries, duplicate precision values, reported % moisture (% solids) and reported Cr^{+6} results were randomly verified from the raw data with no disparities between reported and calculated results found.

No positive Cr^{+6} result was reported for the field blank sample (FB022311).

SECTION D
Total Metals

Holding times from sample collection to analysis were met for all total metals samples.

Calibration and QC criteria were met for this sample group, including: initial calibration linearity, continuing calibration frequency and accuracy, blanks, interference checks, matrix spike recoveries, duplicate precision, LCS recoveries and serial dilution sample precision. Reported spike recoveries, duplicate precision values, reported % moisture (% solids) were randomly verified from the raw data with no disparities between reported and calculated results found.

It is noted that no post-digestion spike samples were reported for this delivery group. Serial dilution samples were reported; no results in these samples exceeded the applicable threshold for calculation of percent difference.

No positive element results were reported for the field blank sample (FB022311).

SECTION E
pH / Eh (ORP)

Samples for pH analysis were analyzed outside the method-defined holding-time of 15 minutes, which is essentially a 'field-performed' analysis. The laboratory assigned all reported pH results an 'HF' qualifier flag to indicate this exception. Since the samples were chilled on receipt at the lab, and analyzed within one day of receipt, no data validation qualifiers were assigned.

Calibrations for pH analysis were acceptable, as were required QC criteria (sample duplicates). Standard mV solution checks for Eh (Light's solution) were within acceptable ranges, as were sample duplicate measurements.

Reported pH and eH (ORP) values and resulting ReDox (reducing or oxidizing) characteristics were randomly verified from the $HCrO_4$- / $Cr(OH)_3$ phase diagram; no disparities relative to reported values and characteristics were found. These values are only used for data assessment purposes when Cr^{+6} sample spike recoveries are outside acceptable recovery ranges.

SECTION F
COLLOCATED SAMPLES

REP022311-1 and -2 were identified as being collocated with 107_D019_8.0 and 108_M018_12.0 (460-23391-3 and -8), respectively. Precision results (as %RPD) are tabulated below. Note: ND = Not Detected ; nc = not calculated ; * = absolute difference is shown if either sample <5x CRQL

	D019_8.0	R022311-1	%RPD	M018_12.0	R022311-2	%RPD
Chromium	20.7	23.9	14.3	12.7	15.9	22.4
Nickel	14.0	13.7	0.3 *	10.5	12.2	1.7 *
Antimony	ND	ND	nc	ND	ND	nc
Thallium	ND	ND	nc	ND	ND	nc
Vanadium	29.4	32.9	3.5 *	18.3	20.1	1.8 *
Cr (VI)	ND	4.6	4.6 *	ND	ND	nc

The NJDEP DV guidance protocols do not provide qualification thresholds for field duplicate precision values; however, EPA Region II data validation guidance (SOP No. HW-2, Rev. 13, Sept. 2006) provides for a qualification range of >35%, <120% RPD for soils >5x CRQL values, and difference >2x CRQL if either sample is <5x CRQL. No QA action is necessary based on the above field duplicate precision results.

SECTION G
Overall Recommendations

The results of the review and validation process for the above analytical fractions and associated samples are summarized on the attached standard-format NJDEP Data Validation Report Forms, in order to facilitate the end-user's' review of these data.

Very truly yours,
Environmental Quality Associates, Inc.

Chris W. Taylor
Vice President

SW-846 INORGANICS-1

DATA DELIVERABLE REQUIREMENTS

Site Name___**PPG SITES 107 & 108**_____ Lab Job No. _**460-23391-1**_____

Location____**NJ**_____ Date of Review___**06/04/2011**_____

Laboratory Name__**TestAmerica Edison**___ Client_**Dresdner-Robin Environmental**___

Reviewer___**C. Taylor / EQA, Inc.**_____ Client Contact__**Douglas Neumann**____

GENERAL REQUIREMENTS: Circle YES or NO and list the deviations at the bottom:

A. Permanently Bound	N/A	G. Methodology Review	Yes No
B. Paginated	Yes No	H. Uninitialed Strikeovers	Yes No
C. Title Page	Yes No	I. Legible Photocopies	Yes No
D. Table of Contents	Yes No	J. Consistent Dates	Yes No
E. Chain of Custody	Yes No	K. Digestion Log	Yes No
F. Non-conformance Summa	Yes No		

Describe any deviations from the requirements

SW-846 INORGANICS-2

HOLDING TIMES FOR METALS

Matrix: Aqueous ( ) or Nonaqueous (X)

SAMPLE LAB ID 460-23391-	SITE ID	SAMPLE FIELD ID	DATE of SAMPLE COLLECTION	ICP ANALYSIS DATE	HOLDING TIME EXCEEDED
1	107_	D019_0.0	02/23/11	03/01/11	NO
2	107_	D019_4.0	02/23/11	03/01/11	NO
3	107_	D019_8.0	02/23/11	03/01/11	NO
4	107_	D019_12.0	02/23/11	03/01/11	NO
5	108_	M018_0.0	02/23/11	03/01/11	NO
6	108_	M018_4.0	02/23/11	03/01/11	NO
7	108_	M018_8.0	02/23/11	03/01/11	NO
8	108_	M018_12.0	02/23/11	03/01/11	NO
9	108_	M018_3.5	02/23/11	03/01/11	NO
10	108_	M006_0.0	02/23/11	03/01/11	NO
11	108_	M006_4.0	02/23/11	03/01/11	NO
12	108_	M006_8.0	02/23/11	03/01/11	NO
13	108_	M006_12.0	02/23/11	03/01/11	NO
14	108_	C002_0.0	02/23/11	03/01/11	NO
15	108_	C002_4.0	02/23/11	03/01/11	NO
16	108_	C002_8.0	02/23/11	02/28/11	NO
17	108_	C002_12.0	02/23/11	03/01/11	NO
18	108_	B006_0.0	02/23/11	03/01/11	NO
19	108_	B006_3.5	02/23/11	02/28/11	NO
20	108_	B006_7.5	02/23/11	02/28/11	NO
21	108_	B006_11.5	02/23/11	02/28/11	NO
22	107_	REP-022311-1	02/23/11	03/01/11	NO
23	108_	B008_0.0	02/23/11	03/01/11	NO
24	108_	B008_4.5	02/23/11	03/01/11	NO
25	108_	B008_8.5	02/23/11	03/01/11	NO
26	108_	B008_12.5	02/23/11	03/01/11	NO
27	108_	REP-022311-2	02/23/11	03/01/11	NO
28FB		FB022311	02/23/11	02/28/11	NO

COMMENTS_____

_____

_____

COOLER

TEMP_3.4^{O}C__

PRESERVATION_FB PH<2_

SW-846 INORGANICS-3

INSTRUMENT CALIBRATION, INITIAL CALIBRATION CHECK (ICC) and INITIAL CALIBRATION VERIFICATION (ICV)

ASSOCIATED SAMPLES __All SDG samples.

1. Was the ICP instrument (6010B) properly standardized? [Yes] No N/A

   If no, explain and list action. _____

2. Was the ICV/ICC analyzed immediately after the systems were calibrated? [Yes] No

   If no, explain and list action._____

3. Was the ICV/ICC analyzed for every analyte? [Yes] No

   If no, explain and list action._____

4. Do all ICV/ICC analytes meet the QC requirements for % recovery? [Yes] No

   If no, list affected analytes, their % recovery, associated samples, and action.

5. Show calculation for the % recovery of one ICV analyte analyzed by ICP.

   Analyte__Cr_____ (ICP2; ICV 460-65994/5) Lab Value__99%____

Raw conc.:	4948	ug/L	ICV 02/28/11	19:37	Lab value:	99 %
True conc.:	5000	ug/L				
			Calculated recovery = Raw conc./True conc.=			**99.0** %

6. SPECIFIC COMMENTS:_____

_____

_____

CONTINUING CALIBRATION VERIFICATION (CCV) and CALIBRATION CHECK STANDARD (CCS)

ASSOCIATED SAMPLES __All SDG samples.

_____

_____

_____

_____

1. a. Was the CCV/CCS performed at the minimum frequency of 10%? [Yes] No

If no, list action._____

b. Was the CCV/CCS performed after ten samples and at the end of sample analysis? [Yes] No

If no, list action._____

2. Were the CCV/CCS standards analyzed for all analytes? [Yes] No

If no, list affected analytes, their associated samples and action.

_____

_____

3. Was the CCV/CCS concentration near the midpoint of the calibration curve?

[Yes] No

If no, list affected analytes, their associated samples and action.

_____

_____

4. Do all CCV/CCS analytes meet the QC requirement for % recovery? [Yes] No

If no, list affected analytes, their associated samples and action.

_____

_____

_____

CONTINUING CALIBRATION VERIFICATION (CCV) and CALIBRATION CHECK STANDARD (CCS)

5. Show calculation for the % recovery of one CCV analyte analyzed by ICP.

Analyte __Sb____ (ICP2 ; CCV 460-65994/56) Lab value _96%_____

Raw conc.:	956.3	ug/L	CCV 03/01/11 01:19	Lab value:	96	%
True conc.:	1000	ug/L	Calculated recovery = Raw conc./True conc.=		**95.6**	%

6. SPECIFIC COMMENTS_____

_____

_____

_____

SW-846 INORGANICS-6

METHOD BLANK SUMMARY

Method Blank ID__MB460-65753/1-A^2_____ Sample matrix: [Soil] Water

__MB460-65754/1-A^2_____ Units: [mg/kg] ug/L

Did the frequency of the method blank analysis meet method requirements? [Yes] No

If no, explain and note action

_____

_____

_____

ANALYTE	CONCENTRATION	<MDL	COMMENTS / ACTION
Cr, Ni, Sb, Tl, V	U		n/a

ASSOCIATED SAMPLES ___All SDG soil samples_____

_____

_____

SW-846 INORGANICS-7

CALIBRATION BLANKS

ASSOCIATED SAMPLES __All SDG soil samples_____

_____

_____

_____

_____

1. Were the initial calibration blanks analyzed for all analytes and run after the ICV/ICC?

   [Yes] No

   If no, list affected analytes, and action. _____

   _____

   _____

2. Was the absolute value for all analytes in the calibration blank below the MDL?

   Yes [No]

   If no, list affected analytes and qualify them. *Tl in ICB and CCB >MDL, <RL bracketing analysis of 23391-14. No action taken, since Tl non-detect (U) in affected sample.*

3. Were the continuing calibration blanks analyzed for all analytes and run after the CCV/CCS?

   [Yes] No

   If no, list affected analytes, associated samples and action. _____

   _____

   _____

   _____

4. Was the frequency for the continuing calibration blanks correct? [Yes] No

   If no, list affected analytes, associated samples and action._____

   _____

   _____

ICP INTERFERENCE CHECK SAMPLE

ASSOCIATED SAMPLES __All SDG samples_____

_____

_____

1. Was an ICP interference check sample performed at the correct frequency?

Yes No

If no, note any deviations and action._____

_____

2. Were the analytes interest and interferents for ICS reported? Yes No

If no, note deviations._____

3. Did all the required analytes of interest in the ICS meet the QC limit of 80-120%?

Yes No

If no, list the analytes, the % recovery, associated samples and the action.___

_____

4. Show the calculation for the % recovery for one analyte in the ICS.

Analyte _Sb_____ ICSAB ID:__460-65994/64___ Lab value _90%_____

Raw conc.: 90.2 ug/L	Lab value: 90 %
True conc.: 100 ug/L	
Calculated recovery = Raw conc./True conc.=	**90.2** %

5. COMMENTS_____

_____

_____

SW-846 INORGANICS-10

MATRIX SPIKE (MS) and MATRIX SPIKE DUPLICATE (MSD)

Part 1 of 2

Spike Analysis performed on sample __108_B006_3.5 MS____ % Solids__86.3___
(460-23391-19 MS)

Sample matrix: [Soil] Water

Units: [mg/kg] ug/L

ASSOCIATED SAMPLES: 460-23391-9 through -27. Recoveries for 23391-19 were acceptable. All other SDG samples were associated with a batch matrix spike from this SDG (108_M018_12.0 MS) Recoveries were acceptable.

1. Was the MS/MSD performed at the correct frequency?

[Yes] No

If no, note deviations and action _____

_____

2. Was the MS/MSD analyses performed on a field sample?

[Yes] No

If no, reject all associated samples._____

3. a. Were two (2) analytical methods used to obtain reported values for one analyte (i.e., ICP and AA) ?

Yes [No]

If yes, list analytes _____

_____

b. Was MS/MSD analysis performed using both methods for that analyte?

[N/A]

If no, reject affected sample(s) which did not have spike analysis performed.

_____

SW-846 INORGANICS-12

MATRIX SPIKE (MS) and MATRIX SPIKE DUPLICATE (MSD)

4. Did the % recovery for all analytes meet the criteria of 75-125 %?

   [Yes] No

   If no, list % recovery in parenthesis next to the analyte out and action.

   ACTION: n/a

5. Did the Relative Percent Difference (RPD) for all analytes meet the requirement of 20% RPD? [Yes] No N/A

   COMMENTS:
   Duplicate results were evaluated on either %RPD or absolute difference, as applicable, based on concentration.

   a. Show calculation for % recovery for one analyte.

   Analyte __Sb __ (460-233981-19 MS) Lab value __85%__

Spike Added: 58.0		(spike - sample) x 100			
Spike conc: 49.5	% rec. =	spike added	=	**85.3**	%
Sample conc: 2.3 U					

   b. Show calculation for % RPD for one analyte.

   Analyte __Cr___ (460-23391-8 DU) Lab value _2%_ RPD

Sample : 12.7		|Sample - Duplicate| x 100			
Duplicate: 13.0	% RPD =	(Sample + Duplicate) / 2	=	**2.3**	%RPD

SW-846 INORGANICS-13

POST-DIGESTION SPIKE ANALYSIS

Post Digestion Spike Analysis performed on sample __PDS was not reported_____

Sample matrix: Soil Water % Solids_____

Units: mg/kg ug/L

ASSOCIATED SAMPLES

_____

_____

_____

_____

_____

1. Was post-digestion spike analysis performed at the correct frequency? Yes No

   If no, list the analyte(s) and action.

   _____

_____

   _____

_____

2. Was post-digestion spike performed on a field sample? Yes No

   If no, list analytes and qualify them.

   _____

_____

   _____

_____

3. List the analyte(s), and their % recovery where post-digestion spike analysis was performed but still did not meet the QC criteria and action. N/A

   _____

_____

   _____

_____

4. Show the calculation for % recovery for at least one analyte where post-digestion spike analysis was performed.

   Analyte _____ Lab value _____

5. Comments: No PDS were reported for this SDG; the associated LCS recoveries and Serial Dilution sample %D precision values were within applicable limits. No data qualifiers were assigned due to the absence of a PDS sample.

SW-846 INORGANICS-15

LABORATORY CONTROL SAMPLE (LCS)

Sample matrix: [Soil] [Water]

Units: [mg/kg] [ug/L]

ASSOCIATED SAMPLES _All SDG samples._____

_____

_____

1. Was the laboratory control sample performed at the correct frequency? [Yes] No

If no, give action. _____

_____

2. Do all analytes meet the QC limits of 80-120 %? [Yes] No

If no, list analytes, their % recovery and action. _____

3. Show the calculation for % recovery for one analyte.

Analyte _Ni_ LCS SRM 460-65753/2-A Lab Value _ 145.4_ (108%)

Soil limits _73.2 – 127 *__

LCS Raw Value : 145 mg/Kg
LCS True Value : 134 mg/Kg

$$\text{LCS \% recovery} = \frac{\text{LCS Raw Value} \times 100}{\text{LCS True Value}} = \boxed{108}\ \%$$

4. Comments: * The LCSS "True Values" listed for Cr and Ni on Form 7A-IN were 236 and 134 mg/Kg. However, the acceptable concentration ranges were listed as 70.8 to 129 and 73.2 to 127 mg/Kg, respectively. Actual found concentrations were very close to the listed true values for Cr and Ni. The acceptable recovery ranges for these elements are presumed to be incorrectly listed.

SERIAL DILUTION ANALYSIS

Serial Dilution performed on samples __107_E004_8.5 (460-23274-13) Dilution Factor 4 ; 20__

Sample matrix: [Soil] Water Units: [mg/kg] ug/L

ASSOCIATED SAMPLES __All SDG soil samples _____

_____

_____

1. Was a serial dilution performed at the correct frequency? [Yes] No

   If no, give action_____

2. Was a field sample used for serial dilution? [Yes] No

   If no, give action_____

3. For all analytes greater than ten times the IDL after dilution for 6010B and 25 times the EDL for 7000A methods, was a serial dilution performed?

   [n/a] No

   If no, list analytes and reject them. _____

4. For all analytes that needed serial dilution analysis, was the QC limit of 10 % D met? [n/a] No

   If no, list those analytes outside the limits and qualify them. _____

5. Show calculation for % D for one analyte analyzed by ICP.

   Analyte __Cr__ (460-23391-19) Lab value _NC%_

Sample value : 14.9

SW-846 INORGANICS-17

Serial Dilution value : 14.7

$$\text{Serial Dilution \% D} = \frac{(\text{Sample} - \text{Serial Dilution}) \times 100}{\text{Sample value}} = \boxed{\textbf{NC}} \quad \% \text{ D}$$

Note: NC = Not Calculated; sample result <50x MDL (IDL) before dilution

METHOD OF STANDARD ADDITION (MSA)

ASSOCIATED SAMPLES ____MSA was not necessary._____

_____

_____

_____

1. If the post digestion spike recovery for Methods 7000A was outside the QC limit, was the MSA performed?

   Yes No N/A

   If no, explain and list action.

_____

_____

_____

2. Was the MSA within the linear range of the instrument? Yes No N/A

   If no, explain and list action.

_____

_____

_____

3. Was the MSA sample and spikes analyzed consecutively? Yes No N/A

   If no, explain and list action.

_____

_____

_____

4. Was the slope of the MSA plot less than 20% difference of the slope of the standard curve? Yes No N/A

   If no, explain and list action.

_____

_____

_____

SW-846 INORGANICS-19

5. Comments:

SW-846 INORGANICS-20

SAMPLE RESULT VERIFICATION

ASSOCIATED SAMPLES ___All SDG samples._____

_____

_____

1. Were all sample results reported within the calibration range? [Yes] No

   If no, list affected samples and action.

   _____

2. Was the raw data free of any anomalies? [Yes] No

   If no, list affected samples and action.

   _____

3. Was the data package free of any computational or transcription errors? [Yes] No

   If no, list affected samples and action.

   _____

4. Was the % solids analysis performed for all nonaqueous samples? [Yes] No N/A

   If no, list affected samples and action.

   _____

5. Show the calculation for % solids for one sample. Lab value __86.3%_____
   Sample ID: _108_B006_3.5

Dry weight :	4.46	gm		Dry weight	x 100		
Wet weight :	5.17	gm	% Solids =	Wet weight	=	**86.3**	%

6. Verify that nonaqueous samples were reported on a dry weight basis by recalculating the result for one analyte in a sample. N/A

   Sample _108_B006_3.5 Analyte __V__ Lab value _22.5 mg/Kg_

Raw value	0.09697	mg/L	Dilution =	4			
Final vol.	50	mL	% Solids =	86.3	mg/L x FV (ml)		
Wet wght	1.00	gm	mg/Kg dry weight =		wet wgt x (%Sol/100) =	**22.5**	mg/ kg

14 December, 2012

Dresdner-Robin Environmental Management
Att: Mr. Douglas Neumann, Director
371 Warren Street
Jersey City, New Jersey 07302

Re: PPG – Site 107, Laboratory Job No. 460-34686-1

Dear Mr. Neumann,

This cover letter, and the attached documents, detail the data validation findings associated with the following sample analytical results contained in the above-referenced deliverables set:

Site Name: PPG – Conrail

Fractions
Hexavalent chromium (Cr^{+6}) Laboratory: TestAmerica Laboratories, Inc.
Total Vanadium (V)
pH / Eh ; ORP

Report No.: 460-34686-1 Matrix: Non-Aqueous

Reviewer: Chris Taylor

Prepared By: Environmental Quality Associates, Inc.

SECTION A
Sample Information

The above-noted laboratory Job Number samples were analyzed by TestAmerica Laboratories, Inc., Edison, NJ (NJ Laboratory ID Cert. No. 12028). Hexavalent chromium (Cr^{+6}) samples were prepared and analyzed using USEPA SW-846 methods 3060A and 7196A. Total metals samples were prepared and analyzed using USEPA SW-846 methods 3050B (3010A for aqueous samples) and 6010B. Oxidation / Reduction Potential (ORP) characteristics were determined by measurement of pH / Eh values for samples and subsequent extrapolation against the $HCrO_4$- / $Cr(OH)_3$ phase diagram; pH and Eh values were measured by Standard Methods 4500H-B and 2580B, respectively.

A summary table of samples analyzed is presented below. Please note that the number of 'Total Samples' listed below is exclusive of associated QC samples (MS / MD).

Field Sample ID	Lab ID	Matrix	Date Collected	Analysis	
				Hex. Cr	Metals (V)
107_MO32E2_0.0	460-00034686-001	S	12/12/11		X
107_MO32E2_0.5	460-00034686-002	S	12/12/11	X	X
107_MO32E2_1.0	460-00034686-003	S	12/12/11	X	X
107_MO32E2_1.5	460-00034686-004	S	12/12/11	X	X
107_MO32E2_4.0	460-00034686-009	S	12/12/11		X
107_MO32E1_0.0	460-00034686-010	S	12/12/11		X
107_MO32E1_0.5	460-00034686-011	S	12/12/11	X	X
107_MO32E1_1.0	**460-00034686-012**	S	12/12/11	X	X
107_MO32E1_1.5	460-00034686-013	S	12/12/11	X	X
107_MO30E2_0.0	460-00034686-019	S	12/12/11	X	X
107_MO30E2_0.5	460-00034686-020	S	12/12/11	X	X
107_MO30E2_4.0	460-00034686-027	S	12/12/11		X
REP121211-1	460-00034686-028	S	12/12/11		X
107_MO30E1_0.0	460-00034686-029	S	12/12/11	X	X
107_MO30E1_0.5	460-00034686-030	S	12/12/11	X	X
107_MO30E1_4.0	460-00034686-037	S	12/12/11		X
107_MO28E2_0.0	460-00034686-038	S	12/12/11	X	X
107_MO28E2_0.5	460-00034686-039	S	12/12/11	X	X
107_MO28E2_1.0	**460-00034686-040**	S	12/12/11	X	X
107_MO28E1_0.0	460-00034686-045	S	12/12/11	X	X
107_MO28E1_0.5	**460-00034686-046**	S	12/12/11	X	X
107_MO28E1_1.0	460-00034686-047	S	12/12/11	X	X
107_MO28E1_1.5	460-00034686-048	S	12/12/11	X	X
107_MO28E1_2.0	460-00034686-049	S	12/12/11	X	X
107_MO28E1_2.5	460-00034686-050	S	12/12/11	X	X
107_MO28E1_3.0	460-00034686-051	S	12/12/11	X	X
107_MO28W_0.0	460-00034686-052	S	12/12/11	X	X
107_MO28W_0.5	460-00034686-053	S	12/12/11	X	X
107_MO28W_1.0	460-00034686-054	S	12/12/11	X	X
107_MO28W_1.5	460-00034686-055	S	12/12/11	X	X
107_MO28W_2.0	460-00034686-056	S	12/12/11	X	X
107_MO28W_2.5	460-00034686-057	S	12/12/11	X	X
107_MO28W_3.0	**460-00034686-058**	S	12/12/11	X	X
REP121211-2	460-00034686-059	S	12/12/11	X	
FB121211	460-00034686-060	A	12/12/11	X	X
107_MO26E2_0.5	460-00034686-061	S	12/12/11	X	X
107_MO26E2_1.0	460-00034686-062	S	12/12/11	X	
107_MO26E2_1.5	460-00034686-063	S	12/12/11	X	
107_MO26E2_2.0	460-00034686-064	S	12/12/11	X	
107_MO26E2_2.5	460-00034686-065	S	12/12/11	X	

Field Sample ID	Lab ID	Matrix	Date Collected	Analysis	
				Hex. Cr	Metals (V)
107_MO26E2_3.0	460-00034686-066	S	12/12/11	X	
107_MO26E2_3.5	460-00034686-067	S	12/12/11	X	X
107_MO26E2_4.0	460-00034686-068	S	12/12/11	X	X
107_MO26E2_4.5	460-00034686-069	S	12/12/11	X	X
107_MO26E2_5.0	460-00034686-070	S	12/12/11	X	X
107_MO26E2_6.0	460-00034686-071	S	12/12/11	X	X
REP121211-3	460-00034686-072	S	12/12/11	X	
107_MO26E1_0.5	460-00034686-073	S	12/12/11	X	X
107_MO26E1_1.0	460-00034686-074	S	12/12/11	X	
107_MO26E1_1.5	460-00034686-075	S	12/12/11	X	
107_MO26E1_2.0	460-00034686-076	S	12/12/11	X	
107_MO26E1_2.5	460-00034686-077	S	12/12/11	X	
107_MO26E1_3.0	460-00034686-078	S	12/12/11	X	
107_MO26E1_3.5	460-00034686-079	S	12/12/11	X	
107_MO26E1_4.0	460-00034686-080	S	12/12/11	X	
107_MO26E1_4.5	460-00034686-081	S	12/12/11	X	
107_MO26E1_5.0	460-00034686-082	S	12/12/11	X	
107_MO26E1_6.0	460-00034686-083	S	12/12/11	X	
REP121211-4	460-00034686-084	S	12/12/11	X	
107_MO26W1_0.5	460-00034686-085	S	12/12/11	X	X
107_MO26W1_1.0	460-00034686-086	S	12/12/11	X	
107_MO26W1_1.5	460-00034686-087	S	12/12/11	X	
107_MO26W1_2.0	460-00034686-088	S	12/12/11	X	
107_MO26W1_2.5	460-00034686-089	S	12/12/11	X	
107_MO26W1_3.0	460-00034686-090	S	12/12/11	X	X
REP121211-5	460-00034686-096	S	12/12/11	X	

S = Non-Aqueous Matrix
A = Aqueous Matrix

Total Samples = 60 (Cr^{+6}) ; 43 (V)
Bold Type indicates sample taken as a Batch QC sample

All samples were received one day from collection. Samples were received on ice at recorded temperatures of -3.1 and 1.9 ^{o}C. No sample condition issues were noted in the sample receipt log ; no QA action was necessary.

SECTION C
Hexavalent Chromium

Holding times from sample collection to analysis ($\leq$24 hours for aqueous matrix; $\leq$30 days for non-aqueous matrix) were met for all samples.

All calibration criteria were met for this sample group, including: initial calibration linearity and continuing calibration frequency and accuracy. Method and calibration blanks for soils were free of contamination.

Reported matrix spike recoveries, duplicate precision values, reported % moisture (% solids) and reported Cr^{+6} results were randomly verified from the raw data with no disparities between reported and calculated results found. Several samples were analyzed at dilution volumes due to Cr^{+6} concentrations above calibrated range; reported RL values were adjusted accordingly for these dilution runs and are noted on the sample result forms.

The matrix spike recovery for soluble Cr^{+6} in batch QC sample MO28W-3.0 (460-34686-58) was below the lower limit, with the sample native (unspiked) concentration >4x spike-added concentration (272 mg/Kg vs. 43 mg/Kg spiked). The sample was not re-spiked and re-analyzed; per NJDEP DV guidance, no further action is necessary and associated results are acceptable for use, therefore no QA action was taken.

SECTION D
Total Metals (V)

Holding times from sample collection to analysis were met for all total metals samples.

Calibration and QC criteria were met for this sample group, including: initial calibration linearity, continuing calibration frequency and accuracy, blanks, interference checks, matrix spike recoveries, duplicate precision, LCS recoveries and serial dilution sample precision. Reported % moisture (% solids) and reported metal results were randomly verified from the raw data with no disparities between reported and calculated results found.

It is noted that no post-digestion spike samples were reported for this delivery group. Serial dilution samples were reported; no results in these samples exceeded the applicable threshold for calculation of percent difference. No positive element results were reported for the field blank sample.

SECTION E
ReDox Characteristics

Reported pH and eH (ORP) values and resulting ReDox (reducing or oxidizing) characteristics were randomly verified from the $HCrO_4$- / $Cr(OH)_3$ phase diagram; no disparities relative to reported values and characteristics were found.

SECTION F
COLLOCATED SAMPLES

Precision of collocated samples is being reported separately.

SECTION G
Overall Recommendations

The results of the review and validation process for the above analytical fractions and associated samples are summarized on the attached standard-format NJDEP Data Validation Report Forms, in order to facilitate the end-user's' review of these data.

Very truly yours,

Environmental Quality Associates, Inc.

Chris W. Taylor
Vice President

17 December, 2012

Dresdner-Robin Environmental Management
Att: Mr. Douglas Neumann, Director
371 Warren Street
Jersey City, New Jersey 07302

Re: PPG – Site 107, Laboratory Job No. 460-34781-1

Dear Mr. Neumann,

This cover letter, and the attached documents, detail the data validation findings associated with the following sample analytical results contained in the above-referenced deliverables set:

Site Name: PPG – Site 107

Fractions
Hexavalent chromium (Cr^{+6})
Total Vanadium (V)
pH / Eh ; ORP

Laboratory: TestAmerica Laboratories, Inc.

Report No.: 460-34781-1

Matrix: Non-Aqueous

Reviewer: Chris Taylor

Prepared By: Environmental Quality Associates, Inc.

SECTION A
Sample Information

The above-noted laboratory Job Number samples were analyzed by TestAmerica Laboratories, Inc., Edison, NJ (NJ Laboratory ID Cert. No. 12028). Hexavalent chromium (Cr^{+6}) samples were prepared and analyzed using USEPA SW-846 methods 3060A and 7196A. Total metals samples were prepared and analyzed using USEPA SW-846 methods 3050B (3010A for aqueous samples) and 6010B. Oxidation / Reduction Potential (ORP) characteristics were determined by measurement of pH / Eh values for samples and subsequent extrapolation against the $HCrO_4$- / $Cr(OH)_3$ phase diagram; pH and Eh values were measured by Standard Methods 4500H-B and 2580B, respectively.

A summary table of samples analyzed is presented below. Please note that the number of 'Total Samples' listed below is exclusive of associated QC samples (MS / MD).

Field Sample ID	Lab ID	Matrix	Date Collected	Hex. Cr	Metals (V)
107_MO20N_0.0	460-00034781-001	S	12/13/11		X
107_MO20N_1.0	460-00034781-002	S	12/13/11	X	X
107_MO20N_1.5	460-00034781-003	S	12/13/11	X	X
107_MO20N_2.5	460-00034781-004	S	12/13/11	X	X
107_MO20N_3.0	460-00034781-005	S	12/13/11	X	X
107_MO20N_3.5	460-00034781-006	S	12/13/11	X	
107_MO20N_4.0	460-00034781-007	S	12/13/11	X	
REP121311-1	460-00034781-008	S	12/13/11	X	X
107_MO22N_0.0	460-00034781-009	S	12/13/11		X
107_MO22N_1.0	460-00034781-010	S	12/13/11		X
107_MO24N_0.5	460-00034781-014	S	12/13/11		X
107_MO26N_0.5	460-00034781-018	S	12/13/11	X	X
107_MO26N_1.0	460-00034781-019	S	12/13/11	X	
107_MO26N_1.5	460-00034781-020	S	12/13/11	X	
107_MO26N_2.0	460-00034781-021	S	12/13/11	X	
107_MO26N_2.5	460-00034781-022	S	12/13/11	X	
107_MO26N_3.0	460-00034781-023	S	12/13/11	X	
107_MO28N_0.0	460-00034781-029	S	12/13/11	X	X
107_MO28N_0.5	460-00034781-030	S	12/13/11	X	X
107_MO28N_1.0	460-00034781-031	S	12/13/11	X	X
107_MO28N_3.0	460-00034781-035	S	12/13/11		X
REP121311-2	460-00034781-036	S	12/13/11	X	X
107_MO30N_0.0	460-00034781-037	S	12/13/11	X	X
107_MO30N_0.5	460-00034781-038	S	12/13/11	X	X
107_MO32N_0.0	460-00034781-046	S	12/13/11		X
107_MO32N_0.5	460-00034781-047	S	12/13/11	X	X
107_MO32N_1.0	460-00034781-048	S	12/13/11	X	X
107_MO32N_1.5	460-00034781-049	S	12/13/11	X	X
107_MO34N_3.0	460-00034781-055	S	12/13/11		X
107_MO34N_3.5	460-00034781-056	S	12/13/11		X
REP121311-3	460-00034781-060	S	12/13/11		X
107_MO26W2_0.5	460-00034781-061	S	12/13/11	X	X
107_MO26W2_1.0	460-00034781-062	S	12/13/11	X	
107_MO26W2_1.5	460-00034781-063	S	12/13/11	X	
107_MO26W2_2.0	460-00034781-064	S	12/13/11	X	
107_MO26W2_2.5	460-00034781-065	S	12/13/11	X	
107_MO26W2_3.0	460-00034781-066	S	12/13/11	X	
107_MO20E2_0.0	460-00034781-073	S	12/13/11		X
107_MO20E2_1.0	460-00034781-074	S	12/13/11	X	X
107_MO20E2_1.5	460-00034781-075	S	12/13/11	X	X

Field Sample ID	Lab ID	Matrix	Date Collected	Hex. Cr	Metals (V)
107_MO20E2_2.5	460-00034781-076	S	12/13/11	X	X
107_MO20E2_3.0	460-00034781-077	S	12/13/11	X	X
107_MO20E2_3.5	460-00034781-078	S	12/13/11	X	X
107_MO20E2_4.0	460-00034781-079	S	12/13/11	X	X
FB121311-1	460-00034781-080	A	12/13/11	X	X

S = Non-Aqueous Matrix
A = Aqueous Matrix

Total Samples = 35 (Cr^{+6}) ; 33 (V)
Bold Type indicates sample taken as a Batch QC sample

All samples were received one day from collection. Samples were received on ice at recorded temperatures of -5.5 and 4.6 ^{o}C. No sample condition issues were noted in the sample receipt log ; no QA action was necessary.

SECTION C
Hexavalent Chromium

Holding times from sample collection to analysis (≤24 hours for aqueous matrix; ≤30 days for non-aqueous matrix) were met for all samples, with the following exceptions:

Samples 107_MO20N_4.0, 107_MO20N_3.5, 107_MO20E2_3.5 and 107_MO20E2_4.0 (Lab IDs 460-34781-7, 6, 78 and 79, respectively) were initially digested and analyzed within the 30-day hold time. Due to soluble MS recovery above the upper limit (142% vs. 125%), the batch required re-digestion and re-analysis, which was performed 12 days outside holding time. *Although the re-digestion analysis soluble MS recovery was within limits, these results are not usable, since the extended hold time (i.e., >32 days from collection) is a rejectable deficiency. Therefore, it is recommended that the data user accept the initial results for the noted QC batch sample group, qualified as estimated 'J', with indication of potential high bias based on the initial prep and analysis high MS recovery.*

All calibration criteria were met for this sample group, including: initial calibration linearity and continuing calibration frequency and accuracy. Method and calibration blanks for soils were free of contamination.

Reported matrix spike recoveries, duplicate precision values, reported % moisture (% solids) and reported Cr^{+6} results were randomly verified from the raw data with no disparities between reported and calculated results found. Several samples were analyzed at dilution volumes due to Cr^{+6} concentrations above calibrated range; reported RL values were adjusted accordingly for these dilution runs and are noted on the sample result forms.

The matrix spike recovery for soluble Cr^{+6} in batch QC sample 107_MO20N_4.0 (Lab ID: 460-34781-7) was above the upper limit (at 142%). Although the sample and associated QC batch samples were re-digested, re-spiked and re-analyzed, this was performed 42 days from collection; per NJDEP DV guidance all samples which are digested / analyzed beyond 32 days from collection are rejected. Therefore, the initial batch results are qualified estimated 'J',with indication of potential high bias.

The matrix duplicate precision result for Cr^{+6} in batch QC sample 107_MO20N_4.0 (Lab ID: 460-34781-7) exceeded the applicable limit of 20% RPD, at 53%. Refer to comments regarding holding time exceedance above; all associated batch samples are qualified as estimated 'J', due to duplicate precision limit exceedance.

No ORP values were reported for samples107_MO20N_3.5 and 107_MO20N_4.0. It is noted that all other non-aqueous samples reported in this SDG indicated oxidizing tendency based on measured ORP values.

SECTION D
Total Metals (V)

Holding times from sample collection to analysis were met for all total metals samples.

Calibration and QC criteria were met for this sample group, including: initial calibration linearity, continuing calibration frequency and accuracy, blanks, interference checks, matrix spike recoveries, duplicate precision, LCS recoveries and serial dilution sample precision. Reported % moisture (% solids) and reported metal results were randomly verified from the raw data with no disparities between reported and calculated results found.

No positive element results were reported for the field blank sample (FB121311).

SECTION E
ReDox Characteristics

Reported pH and eH (ORP) values and resulting ReDox (reducing or oxidizing) characteristics were randomly verified from the $HCrO_4$- / $Cr(OH)_3$ phase diagram; no disparities relative to reported values and characteristics were found.

SECTION F
COLLOCATED SAMPLES

Precision of collocated samples is being reported separately.

SECTION G
Overall Recommendations

The results of the review and validation process for the above analytical fractions and associated samples are summarized on the attached standard-format NJDEP Data Validation Report Forms, in order to facilitate the end-user's' review of these data.

Very truly yours,
Environmental Quality Associates, Inc.

Chris W. Taylor
Vice President

18 December, 2012

Dresdner-Robin Environmental Management
Att: Mr. Douglas Neumann, Director
371 Warren Street
Jersey City, New Jersey 07302

Re: PPG – Site 107, Laboratory Job No. 460-34820-1

Dear Mr. Neumann,

This cover letter, and the attached documents, detail the data validation findings associated with the following sample analytical results contained in the above-referenced deliverables set:

Site Name: PPG – Site 107

Fractions
Hexavalent chromium (Cr^{+6}) Laboratory: TestAmerica Laboratories, Inc.
Total Vanadium (V)
pH / Eh ; ORP

Report No.: 460-34820-1 Matrix: Non-Aqueous

Reviewer: Chris Taylor

Prepared By: Environmental Quality Associates, Inc.

SECTION A
Sample Information

The above-noted laboratory Job Number samples were analyzed by TestAmerica Laboratories, Inc., Edison, NJ (NJ Laboratory ID Cert. No. 12028). Hexavalent chromium (Cr^{+6}) samples were prepared and analyzed using USEPA SW-846 methods 3060A and 7196A. Total metals samples were prepared and analyzed using USEPA SW-846 methods 3050B (3010A for aqueous samples) and 6010B. Oxidation / Reduction Potential (ORP) characteristics were determined by measurement of pH / Eh values for samples and subsequent extrapolation against the $HCrO_4$- / $Cr(OH)_3$ phase diagram; pH and Eh values were measured by Standard Methods 4500H-B and 2580B, respectively.

A summary table of samples analyzed is presented below. Please note that the number of 'Total Samples' listed below is exclusive of associated QC samples (MS / MD).

Field Sample ID	Lab ID	Matrix	Date Collected	Hex. Cr	Metals (V)
107_MO20E1_0.0	460-00034820-001	S	12/14/11		X
107_MO20E1_1.0	460-00034820-002	S	12/14/11	X	X
107_MO20E1_1.5	460-00034820-003	S	12/14/11	X	X
107_MO20E1_2.5	460-00034820-004	S	12/14/11	X	X
107_MO20E1_3.0	460-00034820-005	S	12/14/11	X	X
107_MO20E1_3.5	460-00034820-006	S	12/14/11	X	X
107_MO20E1_4.0	460-00034820-007	S	12/14/11	X	X
107_MO20W_0.0	460-00034820-008	S	12/14/11		X
107_MO20W_1.0	460-00034820-009	S	12/14/11	X	X
107_MO20W_1.5	460-00034820-010	S	12/14/11	X	X
107_MO20W_2.5	460-00034820-011	S	12/14/11	X	X
107_MO20W_3.0	460-00034820-012	S	12/14/11	X	X
107_MO20W_3.5	460-00034820-013	S	12/14/11	X	X
107_MO20W_4.0	460-00034820-014	S	12/14/11	X	X
108_MO18E2_1.0	460-00034820-015	S	12/14/11	X	X
108_MO18E2_3.0	460-00034820-016	S	12/14/11	X	X
108_MO18E2_3.5	460-00034820-017	S	12/14/11	X	X
108_MO18E2_4.0	460-00034820-018	S	12/14/11	X	X
108_MO18E2_4.5	460-00034820-019	S	12/14/11	X	X
108_MO18E2_5.0	460-00034820-020	S	12/14/11	X	X
REP121411-1	460-00034820-021	S	12/14/11	X	X
108_MO18E1_0.5	460-00034820-022	S	12/14/11	X	X
108_MO18E1_1.0	460-00034820-023	S	12/14/11	X	X
108_MO18E1_3.0	460-00034820-024	S	12/14/11	X	X
108_MO18E1_3.5	460-00034820-025	S	12/14/11	X	X
108_MO18E1_4.0	460-00034820-026	S	12/14/11		X
108_MO18E1_4.5	460-00034820-027	S	12/14/11		X
108_MO18E1_5.0	460-00034820-028	S	12/14/11		X
REP121411-2	460-00034820-029	S	12/14/11	X	X
108_MO18N_1.0	460-00034820-030	S	12/14/11	X	X
108_MO18N_1.5	460-00034820-031	S	12/14/11	X	X
108_MO18N_2.0	460-00034820-032	S	12/14/11	X	X
108_MO18N_3.0	**460-00034820-033**	S	12/14/11	X	X
108_MO18N_3.5	460-00034820-034	S	12/14/11	X	X
108_MO18W1_0.5	460-00034820-038	S	12/14/11	X	X
108_MO18W1_1.0	460-00034820-039	S	12/14/11	X	X
108_MO18W1_1.5	460-00034820-040	S	12/14/11	X	X
108_MO18W1_2.5	460-00034820-041	S	12/14/11	X	X
108_MO18W1_3.0	460-00034820-042	S	12/14/11	X	X
108_MO18W1_3.5	460-00034820-043	S	12/14/11	X	X
108_MO18W1_2.0	460-00034820-047	S	12/14/11	X	X
REP121411-3	**460-00034820-048**	S	12/14/11	X	X
108_MO18W2_0.5	460-00034820-049	S	12/14/11	X	X
108_MO18W2_1.0	460-00034820-050	S	12/14/11	X	X
108_MO18W2_3.0	460-00034820-051	S	12/14/11	X	X
108_MO18W2_4.0	460-00034820-052	S	12/14/11	X	X
108_MO18W2_4.5	460-00034820-053	S	12/14/11		X
108_MO18W2_5.0	460-00034820-054	S	12/14/11		X
FB121411-1	460-00034820-055	A	12/14/11	X	X
QC Sample	460-00034820-056	S	12/14/11	X	

S = Non-Aqueous Matrix
A = Aqueous Matrix

Total Samples = 43 (Cr^{+6}) ; 49 (V)
Bold Type indicates sample taken as a Batch QC sample

All samples were received one day from collection. Samples were received on ice at recorded temperatures of -2.7 and 3.4 ^{o}C. No sample condition issues were noted in the sample receipt log ; no QA action was necessary.

SECTION C
Hexavalent Chromium

Holding times from sample collection to analysis (≤24 hours for aqueous matrix; ≤30 days for non-aqueous matrix) were met for all samples.

All calibration criteria were met for this sample group, including: initial calibration linearity and continuing calibration frequency and accuracy. Method and calibration blanks for soils were free of contamination.

Reported matrix spike recoveries, duplicate precision values, reported % moisture (% solids) and reported Cr^{+6} results were randomly verified from the raw data with no disparities between reported and calculated results found. Several samples were analyzed at dilution volumes due to Cr^{+6} concentrations above calibrated range; reported RL values were adjusted accordingly for these dilution runs and are noted on the sample result forms.

The matrix spike recoveries for soluble and insoluble Cr^{+6} in SDG batch QC sample 108_M018N_3.0 (Lab ID: 460-34820-33) were below the lower limit, and below 50% on initial and re-analysis, affecting associated samples (34820-032, 033, 034. Positive Cr^{+6} results for these samples were flagged as estimated 'J', with indication of significant low bias, since the samples were characterized as oxidizing in nature, which should support the presence of hexavalent chromium.

The matrix spike recoveries for soluble Cr^{+6} in SDG batch QC sample REP121411-3 (Lab ID: 460-34820-48) were below the lower limit, but above 50% on initial and re-analysis, affecting associated samples (34820-009, 010, 023, 024, 025, 029030, 031, 038, 039, 040, 041, 042, 043, 048, 049, 050, 051 and 052. Positive Cr^{+6} results for these samples were flagged as estimated 'J', and non-detect results flagged 'UJ', with indication of low bias, since the samples were characterized as oxidizing in nature, which should support the presence of hexavalent chromium.

SECTION D
Total Metals (V)

Holding times from sample collection to analysis were met for all total metals samples.

Calibration and QC criteria were met for this sample group, including: initial calibration linearity, continuing calibration frequency and accuracy, blanks, interference checks, matrix spike recoveries, duplicate precision, LCS recoveries and serial dilution sample precision. Reported % moisture (% solids) and reported metal results were randomly verified from the raw data with no disparities between reported and calculated results found. It is noted that the native sample concentrations for vanadium in QC batch samples 34820-2 and 34820-51 exceeded the spike-added concentration by >>4x, thus obviating meaningful recovery information from these samples. No QA action was necessary.

No positive element results were reported for the field blank sample.

SECTION E
ReDox Characteristics

Reported pH and eH (ORP) values and resulting ReDox (reducing or oxidizing) characteristics were randomly verified from the $HCrO_4$- / $Cr(OH)_3$ phase diagram; no disparities relative to reported values and characteristics were found.

SECTION F
COLLOCATED SAMPLES

Precision of collocated samples is being reported separately.

SECTION G
Overall Recommendations

The results of the review and validation process for the above analytical fractions and associated samples are summarized on the attached standard-format NJDEP Data Validation Report Forms, in order to facilitate the end-user's' review of these data.

Very truly yours,
Environmental Quality Associates, Inc.

Chris W. Taylor
Vice President

Data Deliverable Requirements - Hexavalent Chromium

Site Name : PPG Site 107 / 108 Client : Dresdner-Robin Environmental

Location: NJ Client Contact : Douglas Neumann

Laboratory Name : TestAmerica - Edison Methodology: 3060 7196A

Reviewer : Chris Taylor SDG No.: J34820

Date of Review: 12/18/12

Analysis for Hexavalent Chromium by Method : See Above

	Yes	No		Yes	No
A. Permanently Bound ?		N/A	F. Non-Conformance Summary ?	X	
B. Paginated ?	X		G. Methodology Review ?	X	
C. Title Page ?	X		H. Uninitialed Strikeover ?		X
D. Table of Contents ?	X		I. Legible Xerox ?	X	
E. Chain of Custody ?	X		J. Consistent Dates ?	X	

Describe any deviations from requirements :

Holding Times for Hexavalent Chromium

Site Name : PPG Site 107 / 108

Laboratory Name : TestAmerica - Edison

Reviewer : Chris Taylor

Date of Review: 12/18/2012

Check one: (X) Lab ID X	Matrix	Date of Sample Collection	Cr +6 Analysis Date	Holding Time Exceeded	QA Decision
460-00034820-002	S	12/14/11	01/12/12	0	ACCEPT
460-00034820-003	S	12/14/11	01/12/12	0	ACCEPT
460-00034820-004	S	12/14/11	01/12/12	0	ACCEPT
460-00034820-005	S	12/14/11	01/13/12	0	ACCEPT
460-00034820-006	S	12/14/11	01/19/12	0	ACCEPT
460-00034820-007	S	12/14/11	01/19/12	0	ACCEPT
460-00034820-009	S	12/14/11	01/13/12	0	ACCEPT
460-00034820-010	S	12/14/11	01/13/12	0	ACCEPT
460-00034820-011	S	12/14/11	01/12/12	0	ACCEPT
460-00034820-012	S	12/14/11	01/12/12	0	ACCEPT
460-00034820-013	S	12/14/11	01/19/12	0	ACCEPT
460-00034820-014	S	12/14/11	01/19/12	0	ACCEPT
460-00034820-015	S	12/14/11	01/12/12	0	ACCEPT
460-00034820-016	S	12/14/11	01/12/12	0	ACCEPT
460-00034820-017	S	12/14/11	01/12/12	0	ACCEPT
460-00034820-018	S	12/14/11	01/19/12	0	ACCEPT
460-00034820-019	S	12/14/11	01/19/12	0	ACCEPT
460-00034820-020	S	12/14/11	01/19/12	0	ACCEPT
460-00034820-021	S	12/14/11	01/12/12	0	ACCEPT
460-00034820-022	S	12/14/11	01/12/12	0	ACCEPT
460-00034820-023	S	12/14/11	01/13/12	0	ACCEPT
460-00034820-024	S	12/14/11	01/13/12	0	ACCEPT
460-00034820-025	S	12/14/11	01/13/12	0	ACCEPT
460-00034820-029	S	12/14/11	01/13/12	0	ACCEPT
460-00034820-030	S	12/14/11	01/13/12	0	ACCEPT
460-00034820-031	S	12/14/11	01/13/12	0	ACCEPT
460-00034820-032	S	12/14/11	01/13/12	0	ACCEPT
460-00034820-033	S	12/14/11	01/13/12	0	ACCEPT
460-00034820-034	S	12/14/11	01/13/12	0	ACCEPT
460-00034820-038	S	12/14/11	01/13/12	0	ACCEPT
460-00034820-039	S	12/14/11	01/13/12	0	ACCEPT
460-00034820-040	S	12/14/11	01/13/12	0	ACCEPT
460-00034820-041	S	12/14/11	01/13/12	0	ACCEPT
460-00034820-042	S	12/14/11	01/13/12	0	ACCEPT
460-00034820-043	S	12/14/11	01/13/12	0	ACCEPT
460-00034820-047	S	12/14/11	01/20/12	0	ACCEPT
460-00034820-048	S	12/14/11	01/13/12	0	ACCEPT
460-00034820-049	S	12/14/11	01/13/12	0	ACCEPT
460-00034820-050	S	12/14/11	01/13/12	0	ACCEPT
460-00034820-051	S	12/14/11	01/13/12	0	ACCEPT
460-00034820-052	S	12/14/11	01/13/12	0	ACCEPT
460-00034820-055	A	12/14/11	12/15/11	0	ACCEPT
460-00034820-056	S	12/14/11	01/20/12	0	ACCEPT

List below any samples that exceeded the holding time, and the QA action taken:

Cooler Temp: '2.7, 3.4 °C
Preservation: FB, pH <2

Instrument Calibration Curve and Calibration Check Standard (CCS) for Hexavalent Chromium

Associated samples : All SDG samples

		YES	NO
1.	Was the instrument properly standardized ? (I.e., Blank + 4 conc. Levels; $r^{\wedge 2}$ >0.995 ?) If No, explain and list action :	X	
2.	Was the CCS analyzed at the proper frequency ? (Beginning of run, after each 10 samples, end of run.) If No, explain and list action :	X	
3.	Was the same CCS concentration used throughout the analysis ? If No, list action :	X	
4.	Does the CCS standard meet the QC requirements of 90 - 110% recovery ? If No, list % recovery, and action :	X	

5. Show calculation for the % recovery of Hexavalent Chromium in the CCS standard.

Lab CCS value : 492 ug/L Lab value : **98** % recovery

True CCS value : 500 ug/L CCS (CCV) @ 11:35, 01/13/12

Calculated value = **98.3**
(Lab / True x 100)

6. Specific comments :

Initial calibrations were performed on 12/15/11 (H_2O), and 01/12, 01/13,01/19 and 01/20/12 (soils).

Reported results were verified at random from the raw data; no disparities were noted.

Calibration Blanks for Hexavalent Chromium

Associated samples : All SDG samples

		YES	NO
1.	Was the calibration blank analyzed before the calibration standards during the preparation of the calibration curve ?	X	
	If No, list action :		
2.	Was a calibration blank analyzed after each calibration check standard (CCS) ?	Yes X	
	If No, list action :		
3.	Was the value for Hexavalent Chromium in the calibration blank below the MDL ?	Yes X	
	If No, list action :		
4.	Specific comments :		

Preparation / Reagent Blank Summary
for Hexavalent Chromium

	Soil	Water		
Associated sample matrix :		X	Preparation / Reagent Blank ID :	MB 460-96046/9
Check one (X)				
	mg/Kg	ug/L		
Units :		X		

Did the frequency of the preparation / reagent blank analysis meet method requirements ?	Yes	No
	X	

If No, explain and note action : _____

CONCENTRATION	< or = MDL Yes	No	COMMENTS / ACTION
U	X		

MDL Codes
Yes : < or = MDL
No : > MDL

Associated samples : 460-34820-55 (FB121411)

HEXCR - 5b

Preparation / Reagent Blank Summary
for Hexavalent Chromium

	Soil	Water		
Associated sample matrix :	X		Preparation / Reagent Blank ID :	MB 460-98553/1-A
Check one (X)				MB 460-98748/1-A
	mg/Kg	mg/L		MB 460-98826/1-A
Units :	X			MB 460-98779/1-A
				MB 460-98780/1-A
				MB 460-99528/1-A
				MB 460-99531/1-A

Did the frequency of the preparation / reagent blank analysis meet method requirements ?	Yes	No
	X	

If No, explain and note action : _____

CONCENTRATION	< or = MDL Yes	No	COMMENTS / ACTION
U	X		

MDL Codes
Yes : < or = MDL
No : > MDL

Associated samples : *All SDG soil samples. Refer to Prep Logs for associated batch IDs.*

Method (prep) blanks for all batches were non-detect (ND) for Cr^{+6}.

Pre-digestion Spike Analysis for Non-Aqueous Hexavalent Chromium Samples

Matrix : Non-Aqueous

Units : mg/Kg

Associated samples : All SDG soil samples

		YES	NO
1.	Was the pre-digestion spike analysis performed at the correct frequency ?	X	
	If No, note deviations and action : Spikes were prepared and analyzed for each digestion batch.		
2.	Was the pre-digestion spike analysis performed on a field sample ?	X	
	If No, qualify all associated samples.		
3.	Was the pre-digestion spike analysis performed at the proper concentration ?	X	
	If No, list action :		
4.	Did the pre-digestion spike recovery for Cr +6 meet the criteria of 75 - 125% ?		X

If No, list action :

Sample ID	Sol.Recov.	Insol.Recov.	Ox / Red ?
34820-48	66%	93%	O
re-analysis	69%	86%	
34820-33	25%	45%	O
re-analysis	10%	47%	

See Comments in Item 6. below.

5. Show calculation for pre-digestion spike recovery for Cr^{+6}

a. Soluble Spike Sample ID: 460-3420-33

Lab spiked sample value : 13.5
Lab un-spiked sample value : 1.2
Spike added concentration : 48.4

Calculated value = 25 % recovery
(Spiked - Unspiked) / Spike Added x 100)

Lab value : 25 % recovery

Verified ? yes

b. Insoluble Spike Sample ID: 460-3420-33

Lab spiked sample value : 391
Lab un-spiked sample value : 1.2
Spike added concentration : 857

Calculated value = 45 % recovery
(Spiked - Unspiked) / Spike Added x 100)

Lab value : 45 % recovery

Verified ? yes

6. Specific comments : *1) For samples associated with QC batch 34820-48MS, qualify positives & non-detects for Cr^{+6} as estimated ('J' or 'UJ') with indication of potential low bias.*
2) For samples associated with QC batch 34820-33, non-detects for Cr^{+6} are rejected 'UR' ; positives qualified as estimated ('J') with indication of potential low bias.
The samples were characterized as "Oxidizing" based on ph / ORP phase plots, and therefore should be capable of supporting the presence of Cr^{+6}.
All other SDG soluble / insoluble and PDS recoveries were within limits.

Post - Verification Spike Analysis (PVS) for Hexavalent Chromium

PVS analysis performed on sample(s) : 460-3420-33 Matrix : Non-Aqueous

% Solids : n/a Units : mg/Kg

Associated samples : All SDG soil samples

		YES	NO
1.	Was the PVS analysis performed at the correct frequency and at the proper concentration ? (for H_2O, 30 ug/L or 2x sample, w/e is >) (for soil, 40 mg/Kg or 2x sample, w/e is >)	X	
	If No, note deviations and action :		
2.	Was the PVS analysis performed on a field sample ?	X	
	If No, qualify all associated samples.		
3. a.	Did the PVS recovery for Cr +6 meet the criteria of 85 - 115% ?	X	
	If No, list action :		
3. b.	If the % recovery was less than 85% did the laboratory re-spike and re-analyze the aliquot ?	n/a	
	If No, list action :		
	Did the % recovery for the reanalysis meet the criteria of 85 - 115% ?	n/a	
	If No, list action :		

5. Show calculation for PVS % recovery for Cr +6.

Sample ID:	460-3420-33	Sample ID:	460-34820-48
Lab spiked sample value :	43.2	Lab spiked sample value :	50.6
Lab un-spiked sample value :	1.20	Lab un-spiked sample value :	2.8
Spike added concentration :	48.4	Spike added concentration :	48.2
Calculated value =	86.7 % recovery	Calculated value =	99.1 % recovery
(Spiked - Unspiked) / Spike Added x 100)		(Spiked - Unspiked) / Spike Added x 100)	
Lab value :	87 % recovery	Lab value :	99 % recovery
Verified ?	yes	Verified ?	yes

6. Specific comments :

Duplicate Analysis for Hexavalent Chromium

Duplicate analysis performed on sample(s) : 460-3420-33 Matrix : Non-Aqueous

Units : mg/Kg

Associated samples : All SDG soil samples

		YES	NO
1.	Was the duplicate analysis performed at the correct frequency ?	X	

If No, note deviations and action : Duplicate analyses were prepared and analyzed for each digestion batch.

2.	Was the duplicate analysis performed on a field sample ?	X	

If No, qualify all associated samples.

3.	Did the duplicate results for Cr +6 meet the QC control limits ? (20% RPD for all Aqueous samples & Non-aqueous >/ = 4x RL) (+ / - RL for Non-aqueous samples if either or both are < 4x RL)	X	

If No, list action :

4. Show calculation for % RPD for Cr+6.

Sample ID: 460-3420-33
Lab sample value : 1.2
Lab duplicate value : 1.4

Calculated value = 13.2 % RPD

$$\% \text{ RPD} = \frac{\text{Sample - Duplicate}}{(\text{Sample + Duplicate})/2} \times 100$$

Sample ID: 460-34820-48
Lab sample value : 2.8
Lab duplicate value : 2.8

Calculated value = 0.0 % RPD

$$\% \text{ RPD} = \frac{\text{Sample - Duplicate}}{(\text{Sample + Duplicate})/2} \times 100$$

5. Specific comments : *For both samples shown above, both sample results are below 4x RL values; therefore the applicable precision criterion is a difference <+/- RL.*

The difference between samples is < RL value and meet applicable method criteria.

Laboratory Control Sample (LCS)

Matrix : Non-Aqueous

Units : mg/Kg

Associated samples : All soil samples.

		YES	NO
1.	Was the LCS performed at the correct frequency ?	X	

If No, note deviations and action : LCS were prepared and analyzed for each digestion batch.

		YES	NO
2.	Does the LCS meet the QC limit of 80 - 120% ?	X	

If No, list the %Recovery and action taken.

3 Show calculation for LCS recovery for Cr+6.

Lab LCS value : 11.8
LCS true value : 13.0

Lab value : 91 % Recovery

Calculated value = 91 % Recovery

LCS ID : 98826/2

$$\% \text{ Recovery} = \frac{\text{Laboratory LCS result}}{\text{LCS true value}} \times 100$$

5. Specific comments : *All LCS recoveries were within acceptable limits (80 - 120%).*

Sample Result Verification for Hexavalent Chromium

Associated samples : All SDG samples

		YES	NO
1.	Were all samples reported within the calibration range?	X	
	If No, list affected samples and action :		
2.	Was the raw data free of any anomalies ?	X	
	If No, list affected samples and action :		
3.	Was the data package free of any computational or transcription errors ?	X	
	If No, list affected samples and action :		
4.	Were both 3060 and 7196A pH readings provided for all samples, and within the method requirements ? (Method 3060 : non-aqueous samples must be adjusted to pH 7.0 - 8.0) (Method 7196A : all analytical solutions must be adjusted to pH 1.6 - 2.2)	X	
	If No, list affected samples and action :		
5.	Were hotplate temperatures provided, and within method requirements ? (At least 60 minutes, and between 90 to 95 degrees C)	X	
	If No, list affected samples and action :		

6. Show the calculation for % Solids for one sample.

Sample ID: **460-34820-50**

Sample dry weight 3.55
Sample wet weight 4.97

Calculated % Solids = **71.4**

Lab value : **71.4** % Solids

% Solids = Sample dry weight / Sample wet weight x 100

7. Verify that non-aqueous samples were reported on a dry-weight basis by recalculating the result for Hexavalent Chromium in a sample.

Sample ID: **460-34820-50**

Sample result, wet : 0.7639 mg/L

% Solids = 71.4 %

Lab value : **1100** mg/Kg

Calculated value = **1114** mg/Kg

	curve mg/L	*dig.vol, L*	*dilution*		
Sample Conc., mg/Kg =	0.76391327	0.100	25	=	**1114**
	0.0024	0.714			*mg/Kg*
	wetwgt, Kg	*%sol/100*			

Result verified ? **Yes**
OK - roundi

ARCADIS Design & Consultancy for natural and built assets

PPG Industries

DATA QUALITY ASSESSMENT

Site 107 Fashionland

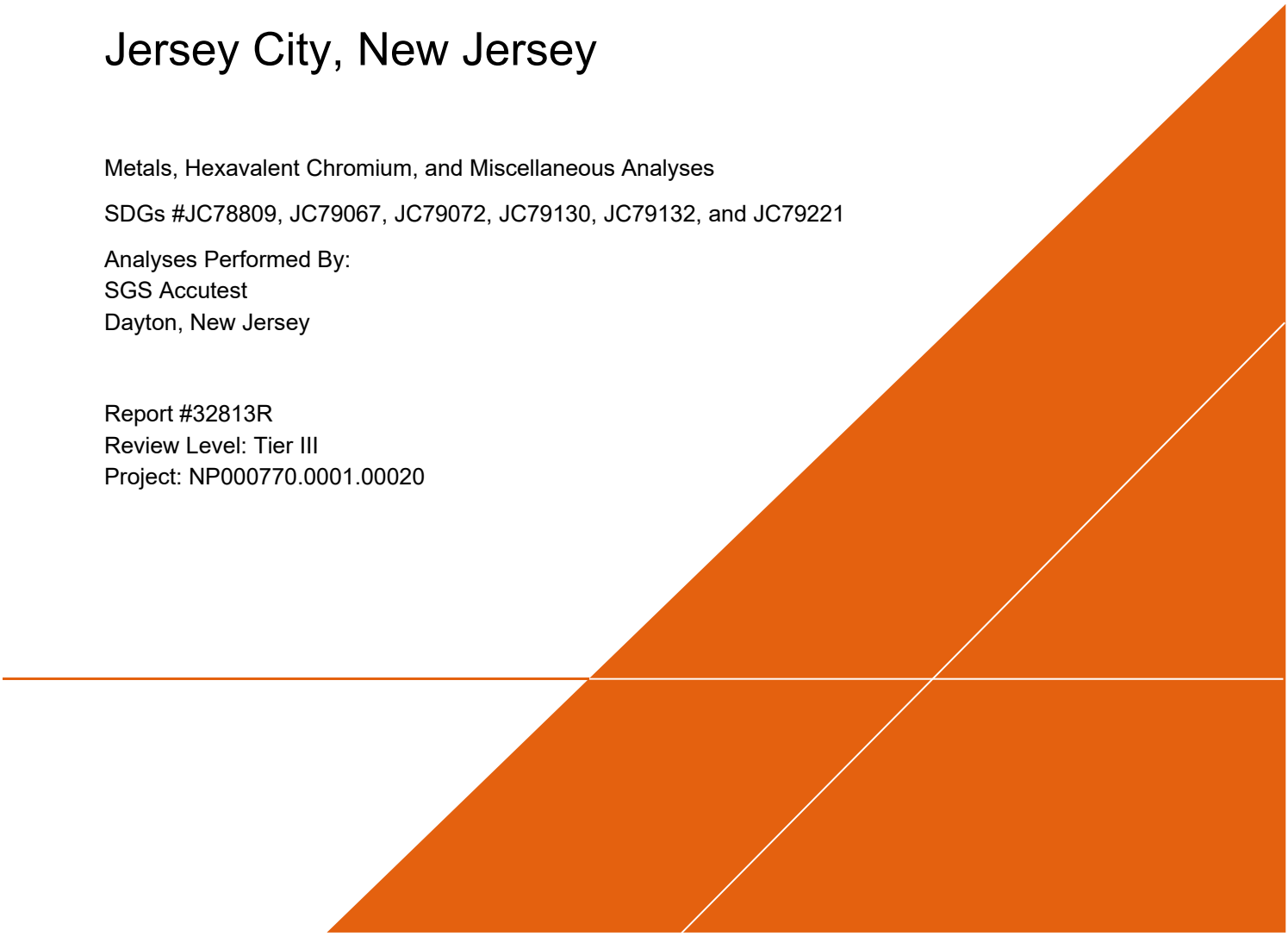
Jersey City, New Jersey

Metals, Hexavalent Chromium, and Miscellaneous Analyses

SDGs #JC78809, JC79067, JC79072, JC79130, JC79132, and JC79221

Analyses Performed By:
SGS Accutest
Dayton, New Jersey

Report #32813R
Review Level: Tier III
Project: NP000770.0001.00020



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Groups (SDGs) # JC78809, JC79067, JC79072, JC79130, JC79132, and JC79221 for samples collected in association with the PPG Industries Site 107 Fashionland, Jersey City, New Jersey Site. The review was conducted as a Tier III evaluation and included review of data package completeness. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

SDG	Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis		
						Cr VI	MET	MISC
JC78809	FB(20181130)	JC78809-1	Water	11/30/2018		X	X	X
	108_M018_C	JC78809-2	Soil	11/30/2018		X	X	X
JC79067	FB(20181204)	JC79067-1	Water	12/4/2018		X	X	X
	BS-B6	JC79067-2	Soil	12/4/2018		X	X	X
	BS-B5	JC79067-3	Soil	12/4/2018		X	X	X
JC79072	FB-A1(20181204)	JC79072-1	Water	12/4/2018		X	X	X
	BS-A6T	JC79072-2	Soil	12/4/2018		X	X	X
	BS-A7	JC79072-3	Soil	12/4/2018		X	X	X
JC79130	FB-A1(20181205)	JC79130-1	Water	12/5/2018		X	X	X
	BS-A7T	JC79130-2	Soil	12/5/2018		X	X	X
	BS-A8T	JC79130-3	Soil	12/5/2018		X	X	X
JC79132	FB(20181205)	JC79132-1	Water	12/5/2018		X	X	X
	BS-B7	JC79132-2	Soil	12/5/2018		X	X	X
	BS-B6D	JC79132-3	Soil	12/5/2018		X	X	X
	BS-C6	JC79132-4	Soil	12/5/2018		X	X	X
JC79221	FB(20181206)	JC79221-1	Water	12/6/2018		X	X	X
	BS-C7D	JC79221-2	Soil	12/6/2018		X	X	X
	BS-C8D	JC79221-3	Soil	12/6/2018		X	X	X
	BS-C9D	JC79221-4	Soil	12/6/2018		X	X	X
	BS-B8	JC79221-5	Soil	12/6/2018		X	X	X
	CS-C8 (2)	JC79221-6	Soil	12/6/2018		X	X	X
	BS-B9	JC79221-7	Soil	12/6/2018		X	X	X

Notes:

1. Metals include antimony, chromium, nickel, thallium, and vanadium. Trivalent chromium is reported by calculation (Chromium) – (Hexavalent Chromium).

2. Cr VI is hexavalent chromium.
3. Miscellaneous parameters include pH and redox potential.
4. SDGs #JC79130 and JC79132: Miscellaneous parameters for samples BS-A7T and BS-B7 also include ferrous iron, sulfide screen, and total organic carbon (TOC).

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of QA or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

Note:
QA - Quality Assurance

INORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Methods 6010C, 7196A, and 9045D; Standard Methods (SM) 4500H+B and SM4500S2-A; Lloyd Kahn; and ASTM D1498-76 and D3872-86. Data were reviewed in accordance with USEPA Region 2 SOP HW-2b, Revision 15 (December 2012); New Jersey Division of Remediation Management and Response Standard Operating Procedure for Analytical Data Validation of Hexavalent Chromium (September 2009); New Jersey Department of Environmental Protection Data Quality Assessment and Data Usability Evaluation Technical Guidance (April 2014); Field Sampling Plan/Quality Assurance Project Plan, PPG Non-Residential and Residential Chromium Sites, Hudson County, New Jersey (AECOM, June 2010); and Arcadis Quality Assurance Project Plan – Addendum, Site 107 Fashionland, Jersey City, New Jersey (Arcadis, June 2018).

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and that it was already subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with the USEPA National Functional Guidelines:

- Concentration (C) Qualifiers
  - U The analyte was analyzed for but not detected. The associated value is the analyte instrument detection limit.
  - B The reported value was obtained from a reading less than the reporting limit (RL), but greater than or equal to the method detection limit (MDL).
- Quantitation (Q) Qualifiers
  - E The reported value is estimated due to the presence of interference.
  - N Spiked sample recovery is not within control limits.
  - * Duplicate analysis is not within control limits.
- Validation Qualifiers
  - J The analyte was positively identified; however, the associated numerical value is an estimated concentration only.
  - J+ The result is an estimated quantity, but the result may be biased high.
  - J- The result is an estimated quantity, but the result may be biased low.
  - UJ The analyte was not detected above the reporting limit. However, the reported limit is approximate and may or may not represent the actual limit of detection.
  - UB Analyte considered non-detect at the listed value due to associated blank contamination.
  - R The data are unusable. The sample results are rejected due to serious deficiencies in meeting Quality Control (QC) critieria. The analyte may or may not be present in the sample.

Two facts should be noted by all data users. First, the “R” flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. “R” values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

METALS ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 6010C	Water	180 days from collection to analysis	Preserved to a pH of less than 2; Cool to <6°C
	Soil	180 days from collection to analysis	Cool to <6°C

All samples were analyzed within the specified holding times.

2. Blank Contamination

Quality assurance (QA) blanks (i.e., method and rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank is calculated for QA blanks containing concentrations greater than the method detection limit (MDL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Analytes were not detected above the MDL in the associated blanks; therefore, detected sample results were not associated with blank contamination.

3. Calibration

Satisfactory instrument calibration is established to provide that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument's continuing performance is satisfactory.

3.1 Initial Calibration and Continuing Calibration

The correct number and type of standards were analyzed. The correlation coefficient of the initial calibration was greater than 0.998 and all initial calibration verification standard and continuing calibration verification standard recoveries were within control limits of 90% to 110%.

All continuing calibration verification standard recoveries were within the control limit.

3.2 Low-Level Calibration Verification

The low-level initial and continuing calibration check standard serves to verify the linearity of calibration of the analysis at the reporting limit.

All RL standard recoveries were within control limits of 70% to 130% (50% to 150% for antimony and thallium).

3.3 ICP Interference Control Sample (ICS)

The ICS verifies the laboratories interelement and background correction factors.

All ICS exhibited recoveries within the control limits of 80% to 120%.

4. Matrix Spike/Matrix Spike Duplicate (MS/MSD)/Laboratory Duplicate Analysis

MS/MSD and laboratory duplicate data are used to assess the precision and accuracy of the analytical method.

4.1 MS/MSD Analysis

All metal analytes must exhibit a percent recovery within the established acceptance limits of 75% to 125%. The MS/MSD recovery control limits do not apply for MS/MSD performed on sample locations where the analyte's concentration detected in the parent sample exceeds the MS/MSD concentration by a factor of four or greater.

The MS/MSD analysis was not performed using a sample from these SDGs.

4.2 Laboratory Duplicate Analysis

The laboratory duplicate relative percent difference (RPD) criterion is applied when parent and duplicate sample concentrations are greater than or equal to 5 times the RL. A control limit of 20% for water matrices and 35% for soil matrices is applied when the criteria above is true. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of ± the RL is applied.

The laboratory duplicate analysis was not performed using a sample from these SDGs.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 50% for soil matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of three times the RL is applied for soil matrices.

Field duplicate samples were not collected in association with these SDGs.

6. Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD) Analysis

The LCS/LCSD analysis is used to assess the precision and accuracy of the analytical method independent of matrix interferences. The analytes associated with the LCS/LCSD analysis must exhibit a percent recovery between the control limits of 80% and 120%. The RPDs between the LCS and LCSD results must be within the laboratory-established acceptance limits.

The LCS/LCSD analysis exhibited recoveries and RPDs within the control limits.

7. Serial Dilution

The serial dilution analysis is used to assess if a significant physical or chemical interference exists due to sample matrix. Analytes exhibiting concentrations greater than 10 times the RL in the undiluted sample are evaluated to determine if matrix interference exists. These analytes are required to have less than a 10% difference (%D) between sample results from the undiluted (parent) sample and results associated with the same sample analyzed with a five-fold dilution.

The serial dilution analysis was not performed using a sample from these SDGs.

8. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR METALS

METALS: SW-846 6010C	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Inductively Coupled Plasma-Atomic Emission Spectrometry (ICP-AES)					
Tier II Validation					
Holding Times		X		X	
Reporting limits (units)		X		X	
Blanks					
A. Instrument Blanks		X		X	
B. Method Blanks		X		X	
C. Equipment/Field Blanks		X		X	
Laboratory Control Sample (LCS)		X		X	
Laboratory Control Sample Duplicate (LCSD)		X		X	
LCS/LCSD Precision (RPD)		X		X	
Matrix Spike (MS) %R	X				X
Matrix Spike Duplicate (MSD) %R	X				X
MS/MSD Precision (RPD)	X				X
Field/Lab Duplicate (RPD)	X				X
ICP Serial Dilution %D	X				X
Total vs. Dissolved	X				X
Reporting Limit Verification		X		X	
Tier III Validation					
Initial Calibration Verification		X		X	
Continuing Calibration Verification		X		X	
CRDL Standard Recovery		X		X	
ICP Interference Check		X		X	
ICP-MS Internal Standards	X				X
Transcription/calculations acceptable		X		X	
Raw Data	X				X
Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%R Percent recovery

RPD Relative percent difference

%D Percent difference

HEXAVALENT CHROMIUM ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 7196A	Water	24 hours from collection to analysis	Cool to <6°C
SW-846 3060A/ 7196A	Soil	30 days from collection to extraction; 7 days from extraction to analysis	Cool to <6°C

All samples were analyzed within the specified holding times.

2. Blank Contamination

Quality assurance (QA) blanks (i.e., method and rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank is calculated for QA blanks containing concentrations greater than the method detection limit (MDL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Analytes were not detected above the MDL in the associated blanks; therefore, detected sample results were not associated with blank contamination.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

The correct number and type of standards were analyzed. The correlation coefficient of the initial calibration was greater than 0.995 and all calibration verification standard recoveries were within control limits of 90% to 110%.

4. Matrix Spike (MS)/Post-Digestion Spike (PDS)/Laboratory Duplicate Analysis

MS, PDS, and laboratory duplicate data are used to assess the precision and accuracy of the analytical method.

4.1 MS Analysis

Soluble and insoluble spike sample analyses are designed to provide information about the effect of the sample matrix on the digestion and measurement methodology. The insoluble spike is used to evaluate the dissolution during the digestion process. Hexavalent chromium must exhibit a percent recovery within

the established acceptance limits of 75% to 125% in both the soluble and insoluble spiked analyses. The control limits do not apply when the parent sample concentration exceeds the spike amount by a factor of four or greater.

SDGs #JC78809, JC79067, JC79072, and JC79221: The MS analysis performed on sample locations 108_M018_C, BS-B6, BS-A6T, and BS-C7D in association with the insoluble and soluble hexavalent chromium analysis exhibited recoveries within the control limits.

SDGs #JC79130 and JC79132: The MS analysis performed on sample locations BS-A7T and BS-B7 in association with the insoluble hexavalent chromium analysis exhibited recoveries within the control limits.

SDGs #JC79130 and JC79132: The MS analysis performed on sample locations BS-A7T and BS-B7 exhibited spike recoveries less than the lower control limits as presented in the table below.

Sample Location	Analyte	Initial Spike Recovery	Reanalysis Spike Recovery
BS-A7T	Hexavalent Chromium, Soluble	72.6%	71.4%
BS-B7	Hexavalent Chromium, Soluble	51.8%	62.1%

The criteria used to evaluate spike recoveries are presented in the following table. The qualifications are applied to all sample results associated with the sample preparation batch. In the event of a recovery outside of the control limits, the MS must be reanalyzed.

Control limit	Sample Result	Qualification[1]
Spike recovery ≥ 50% but < 75%	Non-detect	UJ-
	Detect	J-
Spike recovery < 50%	Non-detect	R
	Detect	R
Spike recovery > 125%	Non-detect	No Action
Spike recovery > 125% but ≤ 150%	Detect	J+
Spike recovery > 150%	Detect	R

Notes:

[1] If recoveries are < 50% or > 150% for both insoluble and soluble spikes, associated data will be rejected ("R"); otherwise qualify associated data if one of the spikes is outside the < 50% or > 150% limits.

SDGs #JC79130 and JC79132: The original analyses of the field samples are usable with appropriate qualification. No sample results were rejected.

4.2 Post-Digestion Spike (PDS) Analysis

The PDS analysis is designed to verify that neither a reducing condition nor a chemical interference is affecting the analysis. This is accomplished by analyzing a second aliquot of the pH-adjusted filtrate that has been spiked with hexavalent chromium. The PDS must exhibit a percent recovery within the method acceptance limits of 85% to 115%.

SDGs #JC78809, JC79067, JC79072, JC79130, JC79132, and JC79221: The PDS analysis performed on sample locations 108_M018_C, BS-B6, BS-A6T, BS-A7T, BS-B7, and BS-C7D exhibited recoveries within the control limits.

4.3 Laboratory Duplicate Analysis

The laboratory duplicate relative percent difference (RPD) criterion is applied when parent and duplicate sample concentrations are greater than or equal to four times the RL. A control limit of 20% is applied when the criteria above is true. In the instance when the parent and/or duplicate sample concentrations are less than or equal to four times the RL, a control limit of ± the RL is used.

SDGs #JC78809, JC79067, JC79072, JC79130, JC79132, and JC79221: The laboratory duplicate analysis performed on sample locations 108_M018_C, BS-B6, BS-A6T, BS-A7T, BS-B7, and BS-C7D exhibited results within the control limit.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 50% for soil matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of three times the RL is applied for soil matrices.

Field duplicate samples were not collected in association with these SDGs.

6. Laboratory Control Sample (LCS) Analysis

The LCS analysis is used to assess the precision and accuracy of the analytical method independent of matrix interferences. The analytes associated with the LCS analysis must exhibit a percent recovery between the control limits of 80% and 120%.

The LCS analysis exhibited recoveries within the control limits.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR HEXAVALENT CHROMIUM

HEXAVALENT CHROMIUM: SW-846 7196A	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Spectrophotometer					
Tier II Validation					
Holding Times		X		X	
Reporting limits (units)		X		X	
Blanks					
A. Instrument Blanks		X		X	
B. Method Blanks		X		X	
C. Equipment/Field Blanks		X		X	
Laboratory Control Sample (LCS)		X		X	
Matrix Spike (MS) %R		X	X		
Matrix Spike Duplicate (MSD) %R	X				X
MS/MSD Precision (RPD)	X				X
Post Digestion Spike %R		X		X	
Field/Lab Duplicate (RPD)		X		X	
Dilution Factor		X		X	
Tier III Validation					
Initial calibration %RSD or correlation coefficient		X		X	
Continuing calibration %R		X		X	
Raw Data		X		X	
Transcription/calculation errors present		X		X	
Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%R Percent recovery

RPD Relative percent difference

%RSD Relative percent deviation

GENERAL CHEMISTRY ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
pH by SM4500H+B	Water	QAPP: 24 hours of receipt at laboratory	Cool to <6°C
pH by SW846 9045D	Soil	QAPP: 24 hours of receipt at laboratory	Cool to <6°C
Oxidation-Reduction Potential by ASTM D1498-76	Water	Not applicable	Cool to <6°C
Oxidation-Reduction Potential (Redox) by ASTM D1498-76	Soil	Measure immediately after creating leachate	Cool to <6°C
Ferrous Iron by ASTM D3872-86	Soil	24 hours from collection to analysis	Cool to <6°C
Sulfide Screen by SM4500S2-A	Soil	7 days from collection to analysis	Cool to <6°C
Total Organic Carbon (TOC) by Lloyd Kahn	Soil	14 days from collection to analysis	Cool to <6°C

The analyses that exceeded the holding are presented in the following table.

Sample Locations	Method	Holding Time	Criteria
108_M018_C	SW846 9045D	Analysis: 2 days	< 24 hours of receipt by laboratory
BS-C7D BS-C8D BS-C9D BS-B8 CS-C8 (2) BS-B9		Analysis: 4 days	
BS-B6 BS-B5 BS-A6T BS-A7		Analysis: 6 days	
BS-A7T BS-B7	ASTM D3872-86	Analysis: 7 days	< 24 hours from collection

Sample results were qualified as specified in the table below. All other holding times were met.

Criteria	Qualification	
	Detected Analytes	Non-detect Analytes
Analysis completed less than two times holding time	J	UJ
Analysis completed greater than two times holding time	J	R

2. Blank Contamination

Quality assurance (QA) blanks (i.e., method and rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank is calculated for QA blanks containing concentrations greater than the method detection limit (MDL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Method blank analysis is not applicable for Redox and pH analyses.

Ferrous iron, sulfide, and TOC were not detected above the MDL in the associated blanks; therefore, detected sample results were not associated with blank contamination.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

The correct number and type of standards were analyzed. All buffer check results were within acceptance limits.

4. Laboratory Duplicate Analysis

Laboratory duplicate data are used to assess the precision of the analytical method. The laboratory duplicate relative percent difference (RPD) criterion is applied when parent and duplicate sample concentrations are greater than or equal to 5 times the RL. A control limit of 20% for water matrices and 35% for soil matrices is applied when the criteria above is true. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of ± the RL is applied.

SDGs #JC78809, JC79067, JC79072, and JC79132: The laboratory duplicate analysis was not performed using a sample from these SDGs.

SDGs #JC79130 and JC79221: The laboratory duplicate analysis performed on sample locations BS-A7T and BS-C7D exhibited results within the control limit.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 50% for soil matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of three times the RL is applied for soil matrices.

Field duplicate samples were not collected in association with these SDGs.

6. Laboratory Control Sample (LCS) Analysis

The LCS analysis is used to assess the precision and accuracy of the analytical method independent of matrix interferences. The analytes associated with the LCS analysis must exhibit a percent recovery between the control limits of 80% and 120%.

LCS results for redox potential, pH, and sulfide screen were not reported in the analytical report.

The LCS analysis performed in association with ferrous iron and TOC exhibited recoveries within the control limits.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR GENERAL CHEMISTRY

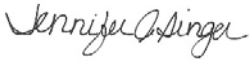
General Chemistry: SM4500H+B, SW846 9045D, ASTM D1498-76	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Miscellaneous Instrumentation					
Tier II Validation					
Holding times		X	X		
Reporting limits (units)		X		X	
Blanks					
A. Instrument Blanks		X		X	
B. Method blanks		X		X	
C. Equipment blanks		X		X	
Laboratory Control Sample (LCS) %R		X		X	
Laboratory Control Sample Duplicate (LCSD) %R	X				X
LCS/LCSD Precision (RPD)	X				X
Matrix Spike (MS) %R	X				X
Matrix Spike Duplicate (MSD) %R	X				X
MS/MSD Precision (RPD)	X				X
Field/Lab Duplicate (RPD)		X		X	
Dilution Factor		X		X	
Tier III Validation					
Initial calibration %RSD or correlation coefficient	X				X
Continuing calibration %R	X				X
Raw Data		X		X	
Transcription/calculation errors present		X		X	
Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%R Percent recovery

RPD Relative percent difference

VALIDATION PERFORMED BY: Jennifer Singer

SIGNATURE: 

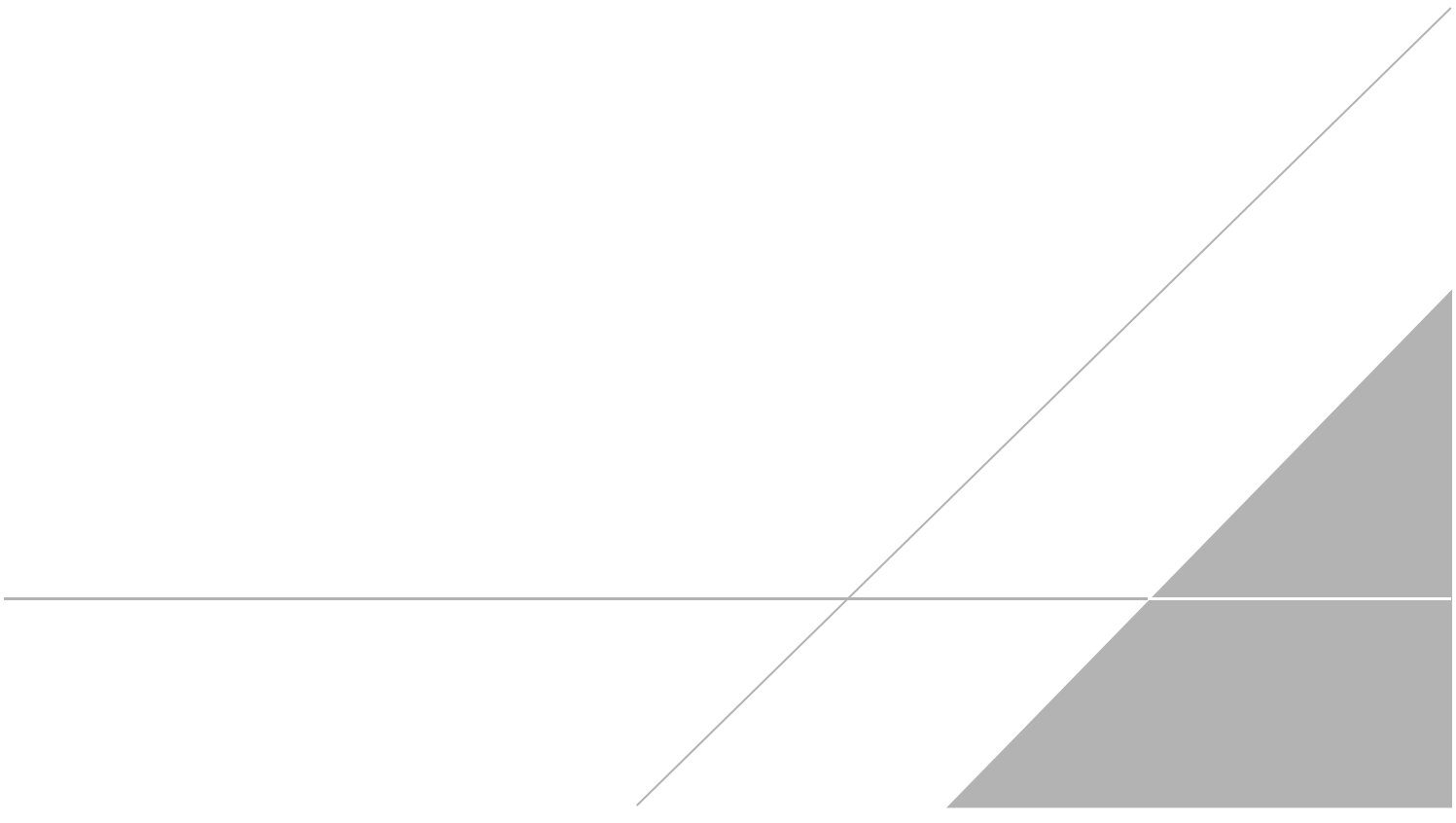
DATE: May 28, 2019

PEER REVIEW: Dennis Capria

DATE: May 31, 2019

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS



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SO
FB

PAGE 1 OF 1

FED-EX Tracking #: | Bottle Order Control #:
SGS Quote #: | SGS Job #: JC78809

Client / Reporting Information

Company Name: Arcadis
Street Address: 10 Friends Lane
City: Newtown State: PA Zip: 18940
Project Contact: Matt Bell E-mail:
Phone #: 646.762.5629 Fax #:
Sampler(s) Name(s): Christin Cifelli Phone #: 201.264.8665

Project Information

Project Name: PPG Jersey City Site 107
Street: 18 Chapel Ave.
City: Jersey City State: NJ
Project #: NP000770.0001.00008
Client Purchase Order #:
Project Manager: Jim McLaughlin

Billing Information (if different from Report to)

Company Name:
Street Address:
City: State: Zip:
Attention:

Requested Analysis (see TEST CODE sheet)

Matrix Codes: DW - Drinking Water; GW - Ground Water; WW - Water; SW - Surface Water; SO - Soil; SL- Sludge; SED-Sediment; OI - Oil; LIQ - Other Liquid; AIR - Air; SOL - Other Solid; WP - Wipe; FB-Field Blank; EB-Equipment Blank; RB- Rinse Blank; TB-Trip Blank

Lab Sample #	Field ID / Point of Collection	MEOH/DI Vial #	Collection Date	Collection Time	Sampled by	Matrix	# of bottles	HCl	NaOH	HNO3	H2SO4	NONE	DI Water	MEOH	ENCORE	Total Chromium	Hexavalent Chromium	Trivalent Chromium	Antimony	Nickel	Thallium	Vanadium	LAB USE ONLY
1	FB(20181130)		11/30/18	0900	CC	FB	4			2		2				X	X	X	X	X	X	X	A7
	~~BS A5~~		~~11/30/18~~		~~CC~~	~~SO~~	~~1~~					~~1~~				~~X~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~	C35
2	108_MO18_C		11/30/18	1345	CC	SO	1					1				X	X	X	X	X	X	X	D32

Turnaround Time (Business days)

- [ ] Std. 10 Business Days
- [ ] 5 Day RUSH
- [ ] 3 Day RUSH
- [x] 2 Day RUSH
- [ ] 1 Day RUSH
- [ ] other

Approved by (SGS Project Manager)/Date:

Emergency & Rush T/A data available via LabLink

Data Deliverable Information

- [ ] Commercial "A" (Level 1)
- [ ] Commercial "B" (Level 2)
- [ ] FULLT1 (Level 3+4)
- [ ] NJ Reduced
- [ ] Commercial "C"
- [ ] NJ Data of Known Quality Protocol Reporting
- [ ] NYASP Category A
- [ ] NYASP Category B
- [ ] State Forms
- [x] EDD Format Equis
- [ ] Other

Commercial "A" = Results Only; Commercial "B" = Results + QC Summary
NJ Reduced = Results + QC Summary + Partial Raw data

Comments / Special Instructions

INITIAL ASSESSMENT 38 DM
LABEL VERIFICATION
Sample inventory is verified upon receipt in the Laboratory

Sample Custody must be documented below each time samples change possession, including courier delivery.

	Relinquished by Sampler:	Date Time:	Received By:	Relinquished By:	Date Time:	Received By:
1		11/30/18 1412	1	2 11/30/18 1443	11/30/18 1846	2
3		Date Time:	3	4	Date Time:	4
5	Relinquished by:	Date Time:	Received By: 5	Custody Seal # 11984 [ ] Intact [ ] Not intact	Preserved where applicable	On Ice: X Cooler Temp: CIP 3.2

Form:SM088-03C (revised 2/12/18)

http://www.sgs.com/en/terms-and-conditions.

5.2 5

JC78809: Chain of Custody
Page 1 of 2

Report of Analysis

Client Sample ID:	FB (20181130)		
Lab Sample ID:	JC78809-1	**Date Sampled:**	11/30/18
Matrix:	AQ - Field Blank Soil	**Date Received:**	11/30/18
		Percent Solids:	n/a
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	< 0.010	0.010	mg/l	1	11/30/18 21:54	LS	SW846 7196A
Redox Potential Vs H2	352		mv	1	12/02/18 14:15	JO	ASTM D1498-76
pH [a]	5.50		su	1	11/30/18 18:45	DG	SM4500H+ B-11

(a) Sample received out of holding time for pH analysis.

RL = Reporting Limit

Report of Analysis

Client Sample ID:	108_M018_C		
Lab Sample ID:	JC78809-2	**Date Sampled:**	11/30/18
Matrix:	SO - Soil	**Date Received:**	11/30/18
		Percent Solids:	81.4
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	10.7	0.49	mg/kg	1	12/04/18 13:18	DC	SW846 3060A/7196A
Redox Potential Vs H2	168		mv	1	12/02/18 11:32	JO	ASTM D1498-76M
Solids, Percent	81.4		%	1	12/01/18 12:48	RC	SM2540 G 18TH ED MOD
pH	8.67 J		su	1	12/02/18 11:50	JO	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID: FB (20181130)
Lab Sample ID: JC78809-1A
Matrix: AQ - Field Blank Soil
Project: PPG Site 107, 18 Chapel Avenue, Jersey City, NJ

Date Sampled: 11/30/18
Date Received: 11/30/18
Percent Solids: n/a

Total Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 6.0	6.0	ug/l	1	12/03/18	12/03/18	ND	SW846 6010D [1]	SW846 3010A [2]
Chromium	< 10	10	ug/l	1	12/03/18	12/03/18	ND	SW846 6010D [1]	SW846 3010A [2]
Nickel	< 10	10	ug/l	1	12/03/18	12/03/18	ND	SW846 6010D [1]	SW846 3010A [2]
Thallium	< 10	10	ug/l	1	12/03/18	12/03/18	ND	SW846 6010D [1]	SW846 3010A [2]
Vanadium	< 50	50	ug/l	1	12/03/18	12/03/18	ND	SW846 6010D [1]	SW846 3010A [2]

(1) Instrument QC Batch: MA45759
(2) Prep QC Batch: MP10965

RL = Reporting Limit

Report of Analysis

Client Sample ID:	FB (20181130)		
Lab Sample ID:	JC78809-1A	**Date Sampled:**	11/30/18
Matrix:	AQ - Field Blank Soil	**Date Received:**	11/30/18
		Percent Solids:	n/a
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	< 0.020	0.020	mg/l	1	12/03/18 17:16	ND	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID: 108_M018_C
Lab Sample ID: JC78809-2A
Matrix: SO - Soil
Project: PPG Site 107, 18 Chapel Avenue, Jersey City, NJ

Date Sampled: 11/30/18
Date Received: 11/30/18
Percent Solids: 81.4

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 2.5	2.5	mg/kg	1	12/03/18	12/03/18	ND	SW846 6010D [1]	SW846 3050B [2]
Chromium	233	1.3	mg/kg	1	12/03/18	12/03/18	ND	SW846 6010D [1]	SW846 3050B [2]
Nickel	12.0	5.0	mg/kg	1	12/03/18	12/03/18	ND	SW846 6010D [1]	SW846 3050B [2]
Thallium	< 1.3	1.3	mg/kg	1	12/03/18	12/03/18	ND	SW846 6010D [1]	SW846 3050B [2]
Vanadium	14.3	6.3	mg/kg	1	12/03/18	12/03/18	ND	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA45758
(2) Prep QC Batch: MP10955

RL = Reporting Limit

Report of Analysis

Client Sample ID:	108_M018_C		
Lab Sample ID:	JC78809-2A	**Date Sampled:**	11/30/18
Matrix:	SO - Soil	**Date Received:**	11/30/18
		Percent Solids:	81.4
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	222	1.8	mg/kg	1	12/04/18 13:18	DC	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

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50
FB

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Page 1 OF 1

FED-EX Tracking # | Bottle Order Control # | SGS Quote # | SGS Job # JC79067

Client / Reporting Information	Project Information	
Company Name: Arcadis	Project Name: PPG Site 107 (Jersey City)	
Street Address: 10 Friends Lane, Suite 200	Street: 18 Chapel Avenue	Billing Information (if different from Report to)
City: Newtown, State: PA, Zip: 18440	City: Jersey City, State: NJ	Company Name
Project Contact: Matthew Bell, E-mail	Project #: NP000770.0001	Street Address
Phone #: 610.755.7080	Client Purchase Order #	City, State, Zip
Sampler(s) Name(s): C Buchanan / C Cifelli, Phone #	Project Manager: Jim Mclaughlin, Jr.	Attention:

Requested Analysis: Total Chromium, Hexavalent Chromium, Trivalent Chromium, Antimony, Nickel, Thallium, Vanadium

Matrix Codes: DW - Drinking Water, GW - Ground Water, WW - Water, SW - Surface Water, SO - Soil, SL - Sludge, SED - Sediment, OI - Oil, LIQ - Other Liquid, AIR - Air, SOL - Other Solid, WP - Wipe, FB - Field Blank, EB - Equipment Blank, RB - Rinse Blank, TB - Trip Blank

SGS Sample #	Field ID / Point of Collection	MEOH/DI Vial #	Date	Time	Sampled by	Grab (G) Comp (C)	Matrix	# of bottles	HCl	NaOH	HNO_3	H_2SO_4	NONE	DI Water	MEOH	ENCORE	Total Chromium	Hexavalent Chromium	Trivalent Chromium	Antimony	Nickel	Thallium	Vanadium	LAB USE ONLY
1	FB(20181204)		12/4/18	1330	CB	G	FB	4			2		2				X	X	X	X	X	X	X	A9
2	BS-B6		12/4/18	1230	CB	G	SO	1					1				X	X	X	X	X	X	X	C28
3	BS-A7		12/4/18	1330	CB	G	SO	1					1				X	X	X	X	X	X	X	C22

Turn Around Time (Business Days) — Approved By (SGS PM): / Date:
- [ ] 10 Business Days
- [ ] 5 Business Days
- [ ] 3 Business Days*
- [x] 2 Business Days*
- [ ] 1 Business Day*
- [ ] Other

All data available via Lablink. * Approval needed for 1-3 Business Day TAT

Deliverable
- [ ] Commercial "A" (Level 1)
- [ ] Commercial "B" (Level 2)
- [ ] NJ Reduced (Level 3)
- [ ] Full Tier I (Level 4)
- [ ] Commercial "C"
- [ ] NJ DKQP
- [ ] NYASP Category A
- [ ] NYASP Category B
- [ ] MA MCP Criteria____
- [ ] CT RCP Criteria____
- [ ] State Forms
- [x] EDD Format _Equis_
- [ ] DOD-QSM5

Commercial "A" = Results only; Commercial "B" = Results + QC Summary
Commercial "C" = Results + QC Summary + Partial Raw data

Comments / Special Instructions

http://www.sgs.com/en/terms-and-conditions

Sample Custody must be documented below each time samples change possession, including courier delivery.

Relinquished by	Date / Time	Received By	Relinquished By	Date / Time	Received By
1 [signature]	12-4-18 1430	1 [signature] 12-4-18 14:30	2 [signature]	12-4-18 1715	2 [signature]
3		3	4		4
5		5	Custody Seal # 10762	Intact / Not intact; Preserved where applicable / Absent: OK	On Ice; Cooler Temp. °C: 3.8°C, IR Therm. ID: 1

Initial Assessment 3BJK

Label Verification______

SGS Post Ex Sample COCs 20181130

JC79067: Chain of Custody
Page 1 of 3

Report of Analysis

Client Sample ID:	FB(20181204)		
Lab Sample ID:	JC79067-1	**Date Sampled:**	12/04/18
Matrix:	AQ - Field Blank Soil	**Date Received:**	12/04/18
		Percent Solids:	n/a
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	< 0.010	0.010	mg/l	1	12/04/18 22:45	LS	SW846 7196A
Redox Potential Vs H2	260		mv	1	12/10/18 11:52	EB	ASTM D1498-76
pH [a]	5.97		su	1	12/04/18 19:03	SUB	SM4500H+ B-11

(a) Sample received out of holding time for pH analysis.

RL = Reporting Limit

Report of Analysis

Client Sample ID: BS-B6
Lab Sample ID: JC79067-2
Matrix: SO - Soil
Project: PPG Site 107, 18 Chapel Avenue, Jersey City, NJ

Date Sampled: 12/04/18
Date Received: 12/04/18
Percent Solids: 84.9

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	1.2	0.47	mg/kg	1	12/10/18 11:15	DC	SW846 3060A/7196A
Redox Potential Vs H2	266		mv	1	12/10/18 13:15	EB	ASTM D1498-76M
Solids, Percent	84.9		%	1	12/08/18 14:00	RC	SM2540 G 18TH ED MOD
pH	7.09 J		su	1	12/10/18 13:17	EB	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID: BS-B5
Lab Sample ID: JC79067-3
Matrix: SO - Soil
Project: PPG Site 107, 18 Chapel Avenue, Jersey City, NJ

Date Sampled: 12/04/18
Date Received: 12/04/18
Percent Solids: 82.4

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	1.9	0.49	mg/kg	1	12/10/18 11:17	DC	SW846 3060A/7196A
Redox Potential Vs H2	278		mv	1	12/10/18 13:51	EB	ASTM D1498-76M
Solids, Percent	82.4		%	1	12/08/18 14:00	RC	SM2540 G 18TH ED MOD
pH	8.80 J		su	1	12/10/18 13:28	EB	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID: FB(20181204)
Lab Sample ID: JC79067-1A
Matrix: AQ - Field Blank Soil
Project: PPG Site 107, 18 Chapel Avenue, Jersey City, NJ

Date Sampled: 12/04/18
Date Received: 12/04/18
Percent Solids: n/a

Total Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 6.0	6.0	ug/l	1	12/05/18	12/07/18	EAL	SW846 6010D [1]	SW846 3010A [2]
Chromium	< 10	10	ug/l	1	12/05/18	12/07/18	EAL	SW846 6010D [1]	SW846 3010A [2]
Nickel	< 10	10	ug/l	1	12/05/18	12/07/18	EAL	SW846 6010D [1]	SW846 3010A [2]
Thallium	< 10	10	ug/l	1	12/05/18	12/07/18	EAL	SW846 6010D [1]	SW846 3010A [2]
Vanadium	< 50	50	ug/l	1	12/05/18	12/07/18	EAL	SW846 6010D [1]	SW846 3010A [2]

(1) Instrument QC Batch: MA45804
(2) Prep QC Batch: MP11069

RL = Reporting Limit

Report of Analysis

Client Sample ID:	FB(20181204)		
Lab Sample ID:	JC79067-1A	**Date Sampled:**	12/04/18
Matrix:	AQ - Field Blank Soil	**Date Received:**	12/04/18
		Percent Solids:	n/a
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	< 0.020	0.020	mg/l	1	12/07/18 15:12	EAL	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-B6		
Lab Sample ID:	JC79067-2A	**Date Sampled:**	12/04/18
Matrix:	SO - Soil	**Date Received:**	12/04/18
		Percent Solids:	84.9
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 2.4	2.4	mg/kg	1	12/05/18	12/06/18	ND	SW846 6010D [1]	SW846 3050B [2]
Chromium	13.1	1.2	mg/kg	1	12/05/18	12/06/18	ND	SW846 6010D [1]	SW846 3050B [2]
Nickel	9.5	4.8	mg/kg	1	12/05/18	12/06/18	ND	SW846 6010D [1]	SW846 3050B [2]
Thallium	< 1.2	1.2	mg/kg	1	12/05/18	12/06/18	ND	SW846 6010D [1]	SW846 3050B [2]
Vanadium	9.2	5.9	mg/kg	1	12/05/18	12/06/18	ND	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA45795
(2) Prep QC Batch: MP11070

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-B6		
Lab Sample ID:	JC79067-2A	**Date Sampled:**	12/04/18
Matrix:	SO - Soil	**Date Received:**	12/04/18
		Percent Solids:	84.9
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	11.9	1.7	mg/kg	1	12/10/18 11:15	DC	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID: BS-B5
Lab Sample ID: JC79067-3A
Matrix: SO - Soil
Project: PPG Site 107, 18 Chapel Avenue, Jersey City, NJ

Date Sampled: 12/04/18
Date Received: 12/04/18
Percent Solids: 82.4

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 2.5	2.5	mg/kg	1	12/05/18	12/07/18	ND	SW846 6010D [1]	SW846 3050B [2]
Chromium	38.5	1.2	mg/kg	1	12/05/18	12/07/18	ND	SW846 6010D [1]	SW846 3050B [2]
Nickel	14.4	5.0	mg/kg	1	12/05/18	12/07/18	ND	SW846 6010D [1]	SW846 3050B [2]
Thallium	< 1.2	1.2	mg/kg	1	12/05/18	12/07/18	ND	SW846 6010D [1]	SW846 3050B [2]
Vanadium	30.3	6.2	mg/kg	1	12/05/18	12/07/18	ND	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA45795
(2) Prep QC Batch: MP11070

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-B5		
Lab Sample ID:	JC79067-3A	**Date Sampled:**	12/04/18
Matrix:	SO - Soil	**Date Received:**	12/04/18
		Percent Solids:	82.4
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	36.6	1.7	mg/kg	1	12/10/18 11:17	DC	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

SGS

SO
FB

CHAIN OF CUSTODY

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TEL. 732-329-0200 FAX: 732-329-3499/3480
www.sgs.com/ehsusa

Page 1 OF 1

FED-EX Tracking #: | Bottle Order Control #:
SGS Quote #: | SGS Job #: JC79072

Client / Reporting Information	Project Information
Company Name: Arcadis	Project Name: PPG Site 107 (Jersey City)
Street Address: 10 Friends Lane, Suite 200	Street: 18 Chapel Avenue
City / State / Zip: Newtown, PA 18440	City / State: Jersey City NJ
Project Contact / E-mail: Matthew Bell	Project #: NP000770.0001
Phone #: 610.755.7080	Client Purchase Order #:
Sampler(s) Name(s) / Phone #: C Buchanan / C Cifelli	Project Manager: Jim Mclaughlin, Jr.

Billing Information (If different from Report to)
Company Name:
Street Address:
City / State / Zip:
Attention:

Requested Analysis

Matrix Codes: DW - Drinking Water; GW - Ground Water; WW - Water; SW - Surface Water; SO - Soil; SL - Sludge; SED-Sediment; OI - Oil; LIQ - Other Liquid; AIR - Air; SOL - Other Solid; WP - Wipe; FB - Field Blank; EB-Equipment Blank; RB - Rinse Blank; TB - Trip Blank

SGS Sample #	Field ID / Point of Collection	MEOH/DI Vial #	Collection Date	Collection Time	Sampled by	Grab (G) Comp (C)	Matrix	# of bottles	Number of preserved Bottles: HCl	NaOH	HNO3	H2SO4	NONE	DI Wtr	MEOH	ENCORE	Total Chromium	Hexavalent Chromium	Trivalent Chromium	Antimony	Nickel	Thallium	Vanadium	LAB USE ONLY
1	FB-A1(20181204)		12/4/18	1340	CB	G	FB	4				2	2				X	X	X	X	X	X	X	
2	BS-A6T		12/4/18	1300	CB	G	SO	1					1				X	X	X	X	X	X	X	A9
3	BS-A7		12/4/18	1345	CB	G	SO	1					1				X	X	X	X	X	X	X	B20 C22

Turn Around Time (Business Days)
Approved By (SGS PM): / Date:

- [ ] 10 Business Days
- [ ] 6 Business Days
- [ ] 3 Business Days*
- [x] 2 Business Days*
- [ ] 1 Business Day*
- [ ] Other

All data available via Lablink
Approval needed for 1-3 Business Day TAT

Deliverable

- [ ] Commercial "A" (Level 1)
- [ ] Commercial "B" (Level 2)
- [ ] RI Reduced (Level 3)
- [ ] Full Tier I (Level 4)
- [ ] Commercial "C"
- [ ] RI DKQP
- [ ] NYASP Category A
- [ ] NYASP Category B
- [ ] MA MCP Criteria
- [ ] CT RCP Criteria
- [ ] State Forms
- [x] EDD Format _Equis_
- [ ] DOD-QSM5

Commercial "A" = Results only; Commercial "B" = Results + QC Summary
Commercial "C" = Results + QC Summary + Partial Rev date

Comments / Special Instructions
http://www.sgs.com/en/terms-and-conditions

Sample Custody must be documented below each time samples change possession, including courier delivery.

	Relinquished by:	Date / Time:	Received By:	Relinquished By:	Date / Time:	Received By:
1		12-4-18 1430	1	2	12-4-18 1715	2
3		Date / Time:	Received By: 3	Relinquished By: 4	Date / Time:	Received By: 4
5	Relinquished by: 6	Date / Time:	Received By: 6	Custody Seal # 083134	Intact / Not intact	Preserved where applicable / Absent / Therm. ID	On Ice 2	Cooler Temp 3.4C

IC

INITIAL ASSESMENT JR 3B
LABEL VERIFICATION

SGS Post Ex Sample COCs 20181130

Report of Analysis

Client Sample ID:	FB-A1(20181204)		
Lab Sample ID:	JC79072-1	**Date Sampled:**	12/04/18
Matrix:	AQ - Field Blank Soil	**Date Received:**	12/04/18
		Percent Solids:	n/a
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	< 0.010	0.010	mg/l	1	12/04/18 22:45	LS	SW846 7196A
Redox Potential Vs H2	258		mv	1	12/10/18 11:55	EB	ASTM D1498-76
pH [a]	5.86		su	1	12/04/18 20:45	SUB	SM4500H+ B-11

(a) Sample received out of holding time for pH analysis.

RL = Reporting Limit

Report of Analysis

Client Sample ID: BS-A6T
Lab Sample ID: JC79072-2
Matrix: SO - Soil
Project: PPG Site 107, 18 Chapel Avenue, Jersey City, NJ

Date Sampled: 12/04/18
Date Received: 12/04/18
Percent Solids: 84.5

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	5.0	0.47	mg/kg	1	12/10/18 13:10	DC	SW846 3060A/7196A
Redox Potential Vs H2	265		mv	1	12/10/18 13:14	EB	ASTM D1498-76M
Solids, Percent	84.5		%	1	12/08/18 14:00	RC	SM2540 G 18TH ED MOD
pH	7.74 J		su	1	12/10/18 13:12	EB	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-A7		
Lab Sample ID:	JC79072-3	**Date Sampled:**	12/04/18
Matrix:	SO - Soil	**Date Received:**	12/04/18
		Percent Solids:	83.5
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	0.54	0.48	mg/kg	1	12/10/18 13:12	DC	SW846 3060A/7196A
Redox Potential Vs H2	267		mv	1	12/10/18 13:12	EB	ASTM D1498-76M
Solids, Percent	83.5		%	1	12/08/18 14:00	RC	SM2540 G 18TH ED MOD
pH	6.36 J		su	1	12/10/18 13:15	EB	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID: FB-A1(20181204)
Lab Sample ID: JC79072-1A
Matrix: AQ - Field Blank Soil
Project: PPG Site 107, 18 Chapel Avenue, Jersey City, NJ

Date Sampled: 12/04/18
Date Received: 12/04/18
Percent Solids: n/a

Total Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 6.0	6.0	ug/l	1	12/05/18	12/07/18	EAL	SW846 6010D [1]	SW846 3010A [2]
Chromium	< 10	10	ug/l	1	12/05/18	12/07/18	EAL	SW846 6010D [1]	SW846 3010A [2]
Nickel	< 10	10	ug/l	1	12/05/18	12/07/18	EAL	SW846 6010D [1]	SW846 3010A [2]
Thallium	< 10	10	ug/l	1	12/05/18	12/07/18	EAL	SW846 6010D [1]	SW846 3010A [2]
Vanadium	< 50	50	ug/l	1	12/05/18	12/07/18	EAL	SW846 6010D [1]	SW846 3010A [2]

(1) Instrument QC Batch: MA45804
(2) Prep QC Batch: MP11069

RL = Reporting Limit

Report of Analysis

Client Sample ID:	FB-A1(20181204)		
Lab Sample ID:	JC79072-1A	**Date Sampled:**	12/04/18
Matrix:	AQ - Field Blank Soil	**Date Received:**	12/04/18
		Percent Solids:	n/a
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	< 0.020	0.020	mg/l	1	12/07/18 15:28	EAL	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-A6T		
Lab Sample ID:	JC79072-2A	**Date Sampled:**	12/04/18
Matrix:	SO - Soil	**Date Received:**	12/04/18
		Percent Solids:	84.5
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 2.3	2.3	mg/kg	1	12/05/18	12/07/18	ND	SW846 6010D [1]	SW846 3050B [2]
Chromium	52.3	1.2	mg/kg	1	12/05/18	12/07/18	ND	SW846 6010D [1]	SW846 3050B [2]
Nickel	14.1	4.6	mg/kg	1	12/05/18	12/07/18	ND	SW846 6010D [1]	SW846 3050B [2]
Thallium	< 1.2	1.2	mg/kg	1	12/05/18	12/07/18	ND	SW846 6010D [1]	SW846 3050B [2]
Vanadium	19.2	5.8	mg/kg	1	12/05/18	12/07/18	ND	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA45795
(2) Prep QC Batch: MP11070

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-A6T		
Lab Sample ID:	JC79072-2A	**Date Sampled:**	12/04/18
Matrix:	SO - Soil	**Date Received:**	12/04/18
		Percent Solids:	84.5
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	47.3	1.7	mg/kg	1	12/10/18 13:10	DC	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-A7		
Lab Sample ID:	JC79072-3A	**Date Sampled:**	12/04/18
Matrix:	SO - Soil	**Date Received:**	12/04/18
		Percent Solids:	83.5
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 2.4	2.4	mg/kg	1	12/05/18	12/07/18	ND	SW846 6010D [1]	SW846 3050B [2]
Chromium	8.7	1.2	mg/kg	1	12/05/18	12/07/18	ND	SW846 6010D [1]	SW846 3050B [2]
Nickel	9.4	4.9	mg/kg	1	12/05/18	12/07/18	ND	SW846 6010D [1]	SW846 3050B [2]
Thallium	< 1.2	1.2	mg/kg	1	12/05/18	12/07/18	ND	SW846 6010D [1]	SW846 3050B [2]
Vanadium	10.7	6.1	mg/kg	1	12/05/18	12/07/18	ND	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA45795
(2) Prep QC Batch: MP11070

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-A7		
Lab Sample ID:	JC79072-3A	**Date Sampled:**	12/04/18
Matrix:	SO - Soil	**Date Received:**	12/04/18
		Percent Solids:	83.5
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	8.2	1.7	mg/kg	1	12/10/18 13:12	DC	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

SGS

SO
FB

CHAIN OF CUSTODY

SGS North America Inc. - Dayton
2235 Route 130, Dayton, NJ 08810
TEL. 732-329-0200 FAX: 732-329-3499/3480
www.sgs.com/ehsusa

Page 1 OF 1

FED-EX Tracking #: | Bottle Order Control #:
SGS Quote #: | SGS Job #: JC79130

Client / Reporting Information	Project Information	
Company Name: Arcadis	Project Name: PPG Site 107 (Jersey City)	
Street Address: 10 Friends Lane, Suite 200	Street: 18 Chapel Avenue	Billing Information (If different from Report to)
City: Newtown, State: PA, Zip: 18440	City: Jersey City, State: NJ	Company Name:
Project Contact: Matthew Bell, E-mail:	Project #: NP000770.0001	Street Address:
Phone #: 610.755.7080	Client Purchase Order #:	City: State: Zip:
Sampler(s) Name(s): G. Quinones, Phone #:	Project Manager: Jim Mclaughlin, Jr.	Attention:

Requested Analysis: Total Chromium, Hexavalent Chromium, Trivalent Chromium, Antimony, Nickel, Thallium, Vanadium

Matrix Codes: DW - Drinking Water; GW - Ground Water; WW - Water; SW - Surface Water; SO - Soil; SL - Sludge; SED - Sediment; OI - Oil; LIQ - Other Liquid; AIR - Air; SOL - Other Solid; WP - Wipe; FB - Field Blank; EB - Equipment Blank; RB - Rinse Blank; TB - Trip Blank

SGS Sample #	Field ID / Point of Collection	MEOH/DI Vial #	Date	Time	Sampled by	Grab (G) Comp (C)	Matrix	# of bottles	HCl	NaOH	HNO3	H2SO4	NONE	DI Water	MEOH	ENCORE	Total Chromium	Hexavalent Chromium	Trivalent Chromium	Antimony	Nickel	Thallium	Vanadium	LAB USE ONLY
1	FB-A1(20181205)		12/5/18	1415	GQ	G	FB	4			2		2				X	X	X	X	X	X	X	
2	BS-A7T		12/5/18	1330	GQ	G	SO	1					1				X	X	X	X	X	X	X	A7
3	BS-A8T		12/5/18	1410	GQ	G	SO	1					1				X	X	X	X	X	X	X	G28 C38

Turn Around Time (Business Days)

- [ ] 10 Business Days
- [ ] 5 Business Days
- [ ] 3 Business Days*
- [X] 2 Business Days*
- [ ] 1 Business Day*
- [ ] Other

Approved By (SGS PM): / Date:

All data available via Lablink. Approval needed for 1-3 Business Day TAT

Deliverable

- [ ] Commercial "A" (Level 1)
- [ ] Commercial "B" (Level 2)
- [ ] NJ Reduced (Level 3)
- [ ] Full Tier I (Level 4)
- [ ] Commercial "C"
- [ ] NJ DKQP
- [ ] NYASP Category A
- [ ] NYASP Category B
- [ ] MA MCP Criteria
- [ ] CT RCP Criteria
- [ ] State Forms
- [X] EDD Format _Equis_
- [ ] DOD-QSM5

Commercial "A" = Results only; Commercial "B" = Results + QC Summary
Commercial "C" = Results + QC Summary + Partial Raw data

Comments / Special Instructions

http://www.sgs.com/en/terms-and-conditions

Sample Custody must be documented below each time samples change possession, including courier delivery.

Relinquished by:	Date / Time:	Received By:	Relinquished By:	Date / Time:	Received By:
1 [signature]	12-5-18 1436	1 Robert Dranbers	2 Robert Dranbers	12.5.18 1550	2 [signature]
3		3	4		4
5		5	Custody Seal # 22902		

Intact / Not intact; Preserved where applicable; Absent; On Ice; Therm. ID: IR; Cooler Temp. °C: 3.2

INITIAL ASSESSMENT 3B ok

LABEL VERIFICATION ______

SGS Post Ex Sample COCs 20181130

JC79130: Chain of Custody
Page 1 of 3

Report of Analysis

Client Sample ID:	FB-A1(20181205)		
Lab Sample ID:	JC79130-1	**Date Sampled:**	12/05/18
Matrix:	AQ - Field Blank Soil	**Date Received:**	12/05/18
		Percent Solids:	n/a
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	< 0.010	0.010	mg/l	1	12/05/18 23:05	LS	SW846 7196A
Redox Potential Vs H2	390		mv	1	12/07/18 08:55	RI	ASTM D1498-76
pH [a]	4.36		su	1	12/05/18 16:34	SUB	SM4500H+ B-11

(a) Sample received out of holding time for pH analysis.

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-A7T		
Lab Sample ID:	JC79130-2	**Date Sampled:**	12/05/18
Matrix:	SO - Soil	**Date Received:**	12/05/18
		Percent Solids:	83.6
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	3.5 J-	0.48	mg/kg	1	12/07/18 12:48	DC	SW846 3060A/7196A
Redox Potential Vs H2	126		mv	1	12/06/18 13:00	RI	ASTM D1498-76M
Solids, Percent	83.6		%	1	12/06/18 16:30	EB	SM2540 G 18TH ED MOD
pH	10.10		su	1	12/06/18 12:54	RI	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-A8T		
Lab Sample ID:	JC79130-3	**Date Sampled:**	12/05/18
Matrix:	SO - Soil	**Date Received:**	12/05/18
		Percent Solids:	84.9
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	1.8 J-	0.47	mg/kg	1	12/07/18 12:50	DC	SW846 3060A/7196A
Redox Potential Vs H2	196		mv	1	12/06/18 13:09	RI	ASTM D1498-76M
Solids, Percent	84.9		%	1	12/06/18 16:30	EB	SM2540 G 18TH ED MOD
pH	7.77		su	1	12/06/18 13:00	RI	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-A7T		
Lab Sample ID:	JC79130-2R	**Date Sampled:**	12/05/18
Matrix:	SO - Soil	**Date Received:**	12/05/18
		Percent Solids:	83.6
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	1.9	0.48	mg/kg	1	12/11/18 11:34	DC	SW846 3060A/7196A

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-A7T		
Lab Sample ID:	JC79130-2RT	**Date Sampled:**	12/05/18
Matrix:	SO - Soil	**Date Received:**	12/05/18
		Percent Solids:	83.6
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Iron, Ferrous	0.37 J	0.20	%	1	12/12/18 12:00	ST	ASTM D3872-86
Sulfide Screen	NEGATIVE			1	12/12/18	MP	SM4500S2- A-11
Total Organic Carbon	317	120	mg/kg	1	12/12/18 18:54	JO	LLOYD KAHN 1988 MOD

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-A8T		
Lab Sample ID:	JC79130-3R	**Date Sampled:**	12/05/18
Matrix:	SO - Soil	**Date Received:**	12/05/18
		Percent Solids:	84.9
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	2.7	0.47	mg/kg	1	12/11/18 11:36	DC	SW846 3060A/7196A

RL = Reporting Limit

Report of Analysis

Client Sample ID: FB-A1(20181205)
Lab Sample ID: JC79130-1A
Matrix: AQ - Field Blank Soil
Project: PPG Site 107, 18 Chapel Avenue, Jersey City, NJ

Date Sampled: 12/05/18
Date Received: 12/05/18
Percent Solids: n/a

Total Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 6.0	6.0	ug/l	1	12/06/18	12/07/18	ND	SW846 6010D [1]	SW846 3010A [2]
Chromium	< 10	10	ug/l	1	12/06/18	12/07/18	ND	SW846 6010D [1]	SW846 3010A [2]
Nickel	< 10	10	ug/l	1	12/06/18	12/07/18	ND	SW846 6010D [1]	SW846 3010A [2]
Thallium	< 10	10	ug/l	1	12/06/18	12/07/18	ND	SW846 6010D [1]	SW846 3010A [2]
Vanadium	< 50	50	ug/l	1	12/06/18	12/07/18	ND	SW846 6010D [1]	SW846 3010A [2]

(1) Instrument QC Batch: MA45795
(2) Prep QC Batch: MP11083

RL = Reporting Limit

Report of Analysis

Client Sample ID:	FB-A1(20181205)		
Lab Sample ID:	JC79130-1A	**Date Sampled:**	12/05/18
Matrix:	AQ - Field Blank Soil	**Date Received:**	12/05/18
		Percent Solids:	n/a
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	< 0.020	0.020	mg/l	1	12/07/18 07:12	ND	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID: BS-A7T
Lab Sample ID: JC79130-2A
Matrix: SO - Soil
Project: PPG Site 107, 18 Chapel Avenue, Jersey City, NJ

Date Sampled: 12/05/18
Date Received: 12/05/18
Percent Solids: 83.6

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 2.4	2.4	mg/kg	1	12/06/18	12/07/18	ND	SW846 6010D [1]	SW846 3050B [2]
Chromium	33.3	1.2	mg/kg	1	12/06/18	12/07/18	ND	SW846 6010D [1]	SW846 3050B [2]
Nickel	11.4	4.7	mg/kg	1	12/06/18	12/07/18	ND	SW846 6010D [1]	SW846 3050B [2]
Thallium	< 1.2	1.2	mg/kg	1	12/06/18	12/07/18	ND	SW846 6010D [1]	SW846 3050B [2]
Vanadium	11.4	5.9	mg/kg	1	12/06/18	12/07/18	ND	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA45795
(2) Prep QC Batch: MP11078

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-A7T		
Lab Sample ID:	JC79130-2A	**Date Sampled:**	12/05/18
Matrix:	SO - Soil	**Date Received:**	12/05/18
		Percent Solids:	83.6
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	29.8	1.7	mg/kg	1	12/07/18 12:48	DC	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-A8T		
Lab Sample ID:	JC79130-3A	**Date Sampled:**	12/05/18
Matrix:	SO - Soil	**Date Received:**	12/05/18
		Percent Solids:	84.9
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 2.4	2.4	mg/kg	1	12/06/18	12/07/18	ND	SW846 6010D [1]	SW846 3050B [2]
Chromium	279	1.2	mg/kg	1	12/06/18	12/07/18	ND	SW846 6010D [1]	SW846 3050B [2]
Nickel	7.3	4.9	mg/kg	1	12/06/18	12/07/18	ND	SW846 6010D [1]	SW846 3050B [2]
Thallium	< 1.2	1.2	mg/kg	1	12/06/18	12/07/18	ND	SW846 6010D [1]	SW846 3050B [2]
Vanadium	20.4	6.1	mg/kg	1	12/06/18	12/07/18	ND	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA45795
(2) Prep QC Batch: MP11078

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-A8T		
Lab Sample ID:	JC79130-3A	**Date Sampled:**	12/05/18
Matrix:	SO - Soil	**Date Received:**	12/05/18
		Percent Solids:	84.9
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	277	1.7	mg/kg	1	12/07/18 12:50	DC	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

SGS

SO FB

CHAIN OF CUSTODY

SGS North America Inc. - Dayton
2235 Route 130, Dayton, NJ 08810
TEL. 732-329-0200 FAX: 732-329-3499/3480
www.sgs.com/ehsusa

Page 1 OF 1 JC79132

FED-EX Tracking #:
Bottle Order Control #:
SGS Quote #:
SGS Job #: JC79131

Client / Reporting Information	Project Information	
Company Name: Arcadis	Project Name: PPG Site 107 (Jersey City)	
Street Address: 10 Friends Lane, Suite 200	Street: 18 Chapel Avenue	Billing Information (If different from Report to)
City: Newtown, State: PA, Zip: 18440	City: Jersey City, State: NJ	Company Name:
Project Contact: Matthew Bell, E-mail:	Project #: NP000770.0001	Street Address:
Phone #: 610.755.7080	Client Purchase Order #:	City: State: Zip:
Sampler(s) Name(s): G. Quinones, Phone #:	Project Manager: Jim Mclaughlin, Jr.	Attention:

Matrix Codes: DW - Drinking Water, GW - Ground Water, WW - Water, SW - Surface Water, SO - Soil, SL - Sludge, SED - Sediment, OI - Oil, LIQ - Other Liquid, AIR - Air, SOL - Other Solid, WP - Wipe, FB - Field Blank, EB - Equipment Blank, RB - Rinse Blank, TB - Trip Blank

SGS Sample #	Field ID / Point of Collection	MEOH/DI Vial #	Date	Time	Sampled by	Grab (G) Comp (C)	Matrix	# of bottles	HCl	NaOH	HNO_3	H_2SO_4	NONE	DI Water	MEOH	ENCORE	Total Chromium	Hexavalent Chromium	Trivalent Chromium	Antimony	Nickel	Thallium	Vanadium	LAB USE ONLY
1	FB(20181205)		12/5/18	1400	GQ	G	FB	4			2		2				X	X	X	X	X	X	X	
2	BS-B7		12/5/18	1315	GQ	G	SO	1					1				X	X	X	X	X	X	X	A7
3	BS-B6D		12/5/18	1325	GQ	G	SO	1					1				X	X	X	X	X	X	X	G28
4	BS-C6		12/5/18	1320	GQ	G	SO	1					1				X	X	X	X	X	X	X	C38

Turn Around Time (Business Days) — Approved By (SGS PM): / Date:

- [ ] 10 Business Days
- [ ] 5 Business Days
- [ ] 3 Business Days*
- [X] 2 Business Days*
- [ ] 1 Business Day*
- [ ] Other

All data available via Lablink — Approval needed for 1-3 Business Day TAT

Deliverable

- [ ] Commercial "A" (Level 1)
- [ ] Commercial "B" (Level 2)
- [ ] NJ Reduced (Level 3)
- [ ] Full Tier I (Level 4)
- [ ] Commercial "C"
- [ ] NJ DKQP
- [ ] NYASP Category A
- [ ] NYASP Category B
- [ ] MA MCP Criteria
- [ ] CT RCP Criteria
- [ ] State Forms
- [X] EDD Format _Equis_
- [ ] DOD-QSM5

Commercial "A" = Results only; Commercial "B" = Results + QC Summary
Commercial "C" = Results + QC Summary + Partial Raw data

Comments / Special Instructions

http://www.sgs.com/en/terms-and-conditions

Sample Custody must be documented below each time samples change possession, including courier delivery.

Relinquished by:	Date / Time:	Received By:	Relinquished By:	Date / Time:	Received By:
1 [signature]	12.5.18 1430	1 Robert Chambers	2 Robert Chambers	12.5.18 1550	2 [signature]
3		3	4		4
5		5	Custody Seal # 10532	Intact / Not intact; Preserved where applicable; Absent	On Ice; Cooler Temp. °C: IR 3.2°C; Therm. ID:

INITIAL ASESSMENT 3B JK

LABEL VERIFICATION______

SGS Post Ex Sample COCs 20181130

Report of Analysis

Client Sample ID:	FB(20181205)		
Lab Sample ID:	JC79132-1	**Date Sampled:**	12/05/18
Matrix:	AQ - Field Blank Soil	**Date Received:**	12/05/18
		Percent Solids:	n/a
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	< 0.010	0.010	mg/l	1	12/05/18 23:05	LS	SW846 7196A
Redox Potential Vs H2	403		mv	1	12/07/18 09:03	RI	ASTM D1498-76
pH [a]	4.55		su	1	12/05/18 16:21	SUB	SM4500H+ B-11

(a) Sample received out of holding time for pH analysis.

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-B7		
Lab Sample ID:	JC79132-2	**Date Sampled:**	12/05/18
Matrix:	SO - Soil	**Date Received:**	12/05/18
		Percent Solids:	82.9
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	1.0 J-	0.48	mg/kg	1	12/07/18 13:57	DC	SW846 3060A/7196A
Redox Potential Vs H2	235		mv	1	12/06/18 13:20	RI	ASTM D1498-76M
Solids, Percent	82.9		%	1	12/06/18 16:30	EB	SM2540 G 18TH ED MOD
pH	7.77		su	1	12/06/18 13:08	RI	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID: BS-B6D
Lab Sample ID: JC79132-3
Matrix: SO - Soil
Project: PPG Site 107, 18 Chapel Avenue, Jersey City, NJ

Date Sampled: 12/05/18
Date Received: 12/05/18
Percent Solids: 83.0

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	2.4 J-	0.48	mg/kg	1	12/07/18 13:59	DC	SW846 3060A/7196A
Redox Potential Vs H2	274		mv	1	12/06/18 13:24	RI	ASTM D1498-76M
Solids, Percent	83		%	1	12/06/18 16:30	EB	SM2540 G 18TH ED MOD
pH	7.32		su	1	12/06/18 13:21	RI	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-C6		
Lab Sample ID:	JC79132-4	**Date Sampled:**	12/05/18
Matrix:	SO - Soil	**Date Received:**	12/05/18
		Percent Solids:	83.5
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	5.1 J-	0.48	mg/kg	1	12/07/18 13:59	DC	SW846 3060A/7196A
Redox Potential Vs H2	282		mv	1	12/06/18 13:30	RI	ASTM D1498-76M
Solids, Percent	83.5		%	1	12/06/18 16:30	EB	SM2540 G 18TH ED MOD
pH	7.56		su	1	12/06/18 13:24	RI	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-B7		
Lab Sample ID:	JC79132-2R	**Date Sampled:**	12/05/18
Matrix:	SO - Soil	**Date Received:**	12/05/18
		Percent Solids:	82.9
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	1.1	0.48	mg/kg	1	12/11/18 12:45	DC	SW846 3060A/7196A

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-B7		
Lab Sample ID:	JC79132-2RT	**Date Sampled:**	12/05/18
Matrix:	SO - Soil	**Date Received:**	12/05/18
		Percent Solids:	82.9
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Iron, Ferrous	0.57 J	0.20	%	1	12/12/18 12:00	ST	ASTM D3872-86
Sulfide Screen	NEGATIVE			1	12/12/18	MP	SM4500S2- A-11
Total Organic Carbon	878	120	mg/kg	1	12/12/18 19:36	JO	LLOYD KAHN 1988 MOD

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-B6D		
Lab Sample ID:	JC79132-3R	**Date Sampled:**	12/05/18
Matrix:	SO - Soil	**Date Received:**	12/05/18
		Percent Solids:	83.0
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	2.6	0.48	mg/kg	1	12/11/18 12:47	DC	SW846 3060A/7196A

RL = Reporting Limit

Report of Analysis

Client Sample ID: BS-C6
Lab Sample ID: JC79132-4R
Matrix: SO - Soil
Project: PPG Site 107, 18 Chapel Avenue, Jersey City, NJ

Date Sampled: 12/05/18
Date Received: 12/05/18
Percent Solids: 83.5

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	4.2	0.48	mg/kg	1	12/11/18 12:47	DC	SW846 3060A/7196A

RL = Reporting Limit

Report of Analysis

Client Sample ID: FB(20181205)
Lab Sample ID: JC79132-1A
Matrix: AQ - Field Blank Soil
Project: PPG Site 107, 18 Chapel Avenue, Jersey City, NJ

Date Sampled: 12/05/18
Date Received: 12/05/18
Percent Solids: n/a

Total Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 6.0	6.0	ug/l	1	12/06/18	12/07/18	ND	SW846 6010D [1]	SW846 3010A [2]
Chromium	< 10	10	ug/l	1	12/06/18	12/07/18	ND	SW846 6010D [1]	SW846 3010A [2]
Nickel	< 10	10	ug/l	1	12/06/18	12/07/18	ND	SW846 6010D [1]	SW846 3010A [2]
Thallium	< 10	10	ug/l	1	12/06/18	12/07/18	ND	SW846 6010D [1]	SW846 3010A [2]
Vanadium	< 50	50	ug/l	1	12/06/18	12/07/18	ND	SW846 6010D [1]	SW846 3010A [2]

(1) Instrument QC Batch: MA45795
(2) Prep QC Batch: MP11083

RL = Reporting Limit

Report of Analysis

Client Sample ID:	FB(20181205)		
Lab Sample ID:	JC79132-1A	**Date Sampled:**	12/05/18
Matrix:	AQ - Field Blank Soil	**Date Received:**	12/05/18
		Percent Solids:	n/a
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	< 0.020	0.020	mg/l	1	12/07/18 07:17	ND	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID: BS-B7
Lab Sample ID: JC79132-2A
Matrix: SO - Soil
Project: PPG Site 107, 18 Chapel Avenue, Jersey City, NJ

Date Sampled: 12/05/18
Date Received: 12/05/18
Percent Solids: 82.9

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 2.3	2.3	mg/kg	1	12/06/18	12/07/18	ND	SW846 6010D [1]	SW846 3050B [2]
Chromium	12.9	1.2	mg/kg	1	12/06/18	12/07/18	ND	SW846 6010D [1]	SW846 3050B [2]
Nickel	10.9	4.7	mg/kg	1	12/06/18	12/07/18	ND	SW846 6010D [1]	SW846 3050B [2]
Thallium	< 1.2	1.2	mg/kg	1	12/06/18	12/07/18	ND	SW846 6010D [1]	SW846 3050B [2]
Vanadium	15.6	5.9	mg/kg	1	12/06/18	12/07/18	ND	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA45795
(2) Prep QC Batch: MP11078

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-B7		
Lab Sample ID:	JC79132-2A	**Date Sampled:**	12/05/18
Matrix:	SO - Soil	**Date Received:**	12/05/18
		Percent Solids:	82.9
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	11.9	1.7	mg/kg	1	12/07/18 13:57	DC	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID: BS-B6D
Lab Sample ID: JC79132-3A
Matrix: SO - Soil
Project: PPG Site 107, 18 Chapel Avenue, Jersey City, NJ

Date Sampled: 12/05/18
Date Received: 12/05/18
Percent Solids: 83.0

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 2.4	2.4	mg/kg	1	12/06/18	12/07/18	ND	SW846 6010D [1]	SW846 3050B [2]
Chromium	23.5	1.2	mg/kg	1	12/06/18	12/07/18	ND	SW846 6010D [1]	SW846 3050B [2]
Nickel	8.0	4.8	mg/kg	1	12/06/18	12/07/18	ND	SW846 6010D [1]	SW846 3050B [2]
Thallium	< 1.2	1.2	mg/kg	1	12/06/18	12/07/18	ND	SW846 6010D [1]	SW846 3050B [2]
Vanadium	14.5	6.0	mg/kg	1	12/06/18	12/07/18	ND	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA45795
(2) Prep QC Batch: MP11078

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-B6D		
Lab Sample ID:	JC79132-3A	**Date Sampled:**	12/05/18
Matrix:	SO - Soil	**Date Received:**	12/05/18
		Percent Solids:	83.0
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	21.1	1.7	mg/kg	1	12/07/18 13:59	DC	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-C6		
Lab Sample ID:	JC79132-4A	**Date Sampled:**	12/05/18
Matrix:	SO - Soil	**Date Received:**	12/05/18
		Percent Solids:	83.5
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 2.4	2.4	mg/kg	1	12/06/18	12/07/18	ND	SW846 6010D [1]	SW846 3050B [2]
Chromium	37.6	1.2	mg/kg	1	12/06/18	12/07/18	ND	SW846 6010D [1]	SW846 3050B [2]
Nickel	10.6	4.9	mg/kg	1	12/06/18	12/07/18	ND	SW846 6010D [1]	SW846 3050B [2]
Thallium	< 1.2	1.2	mg/kg	1	12/06/18	12/07/18	ND	SW846 6010D [1]	SW846 3050B [2]
Vanadium	18.9	6.1	mg/kg	1	12/06/18	12/07/18	ND	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA45795
(2) Prep QC Batch: MP11078

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-C6		
Lab Sample ID:	JC79132-4A	**Date Sampled:**	12/05/18
Matrix:	SO - Soil	**Date Received:**	12/05/18
		Percent Solids:	83.5
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	32.5	1.7	mg/kg	1	12/07/18 13:59	DC	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

SO
FB

CHAIN OF CUSTODY

SGS North America Inc. - Dayton
2235 Route 130, Dayton, NJ 08810
TEL. 732-329-0200 FAX 732-329-3499
www.sgs.com/ehsusa

PAGE 1 OF 1

FED-EX Tracking #	Bottle Order Control #
SGS Quote #	SGS Job # JC79221

Client / Reporting Information

Company Name: Arcadis
Street Address: 10 Friends Lane
City / State / Zip: Newtown PA 18940
Project Contact / E-mail: Matt Bell
Phone # / Fax #: 646, 762.5629
Sampler(s) Name(s) / Phone #: Christina Cifelli 201.264.8005

Project Information

Project Name: PPG Jersey City Site 107
Street: 18 Chapel Ave
City / State: Jersey City NJ
Project #: NP000770.0001.00005
Client Purchase Order #:
Project Manager: Jim McLaughlin

Billing Information (if different from Report to)

Company Name:
Street Address:
City / State / Zip:
Attention:

Requested Analysis (see TEST CODE sheet)

Matrix Codes

DW - Drinking Water
GW - Ground Water
WW - Water
SW - Surface Water
SO - Soil
SL- Sludge
SED-Sediment
OI - Oil
LIQ - Other Liquid
AIR - Air
SOL - Other Solid
WP - Wipe
FB-Field Blank
EB-Equipment Blank
RB- Rinse Blank
TB-Trip Blank

Lab Sample #	Field ID / Point of Collection	MEOH/DI Vial #	Collection Date	Collection Time	Sampled by	Matrix	# of bottles	Number of preserved bottles: HCl	NaOH	HNO3	H2SO4	NONE	DI Water	MEOH	ENCORE	Trivalent Chromium	Hexavalent Chromium	Antimony	Total Chromium	Nickel	Thallium	Vanadium	LAB USE ONLY
1	FB (20181206)		12/6/18	1245	CC	FB	4			2		2				X	X	X	X	X	X	X	A27
	~~LD001~~ (CB)		~~12/6/18~~	1320	CC	SO	1					1				~~X~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~	G55
2	BS-C7D		12/6/18	1300	CC	SO	1					1				X	X	X	X	X	X	X	
3	BS-C8D		12/6/18	1305	CC	SO	1					1				X	X	X	X	X	X	X	C38
4	BS-C9D		12/6/18	1310	CC	SO	1					1				X	X	X	X	X	X	X	
5	BS-B8		12/6/18	1315	CC	SO	1					1				X	X	X	X	X	X	X	
6	CS-C8		12/6/18	1415	CC	SO	1					1				X	X	X	X	X	X	X	
7	LD001		12/6/18	1320	CC	SO	1					1				X	X	X	X	X	X	X	

Turnaround Time (Business days)

- [ ] Std. 10 Business Days
- [ ] 5 Day RUSH
- [ ] 3 Day RUSH
- [x] 2 Day RUSH
- [ ] 1 Day RUSH
- [ ] other

Approved by (SGS Project Manager)/Date:

Emergency & Rush T/A data available via LabLink

Data Deliverable Information

- [ ] Commercial "A" (Level 1)
- [ ] Commercial "B" (Level 2)
- [ ] FULLT1 (Level 3+4)
- [ ] NJ Reduced
- [ ] Commercial "C"
- [ ] NJ Data of Known Quality Protocol Reporting
- [ ] NYASP Category A
- [ ] NYASP Category B
- [ ] State Forms
- [x] EDD Format Equis
- [ ] Other

Commercial "A" = Results Only; Commercial "B" = Results + QC Summary
NJ Reduced = Results + QC Summary + Partial Raw data

Comments / Special Instructions

INITIAL ASESSMENT 3A
LABEL VERIFICATION

Sample inventory is verified upon receipt in the Laboratory

Sample Custody must be documented below each time samples change possession, including courier delivery.

	Relinquished by Sampler:	Date Time:	Received By:	Relinquished By:	Date Time:	Received By:
1	C.F.	12/6/18 1440	1 Schan 12/6/18 230	2 Schan 12/6/18	1535	2
3			3	4		4
5			5	Custody Seal # 12606	Intact / Not intact	Preserved where applicable: On Ice X, Cooler Temp. 4°

Form:SM088-03C (revised 2/12/18)

http://www.sgs.com/en/terms-and-conditions

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5.2 5

Report of Analysis

Client Sample ID:	FB(20181206)		
Lab Sample ID:	JC79221-1	**Date Sampled:**	12/06/18
Matrix:	AQ - Field Blank Soil	**Date Received:**	12/06/18
		Percent Solids:	n/a
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	< 0.010	0.010	mg/l	1	12/06/18 21:55	LS	SW846 7196A
Redox Potential Vs H2	258		mv	1	12/10/18 11:57	EB	ASTM D1498-76
pH [a]	5.22		su	1	12/06/18 16:06	SUB	SM4500H+ B-11

(a) Sample received out of holding time for pH analysis.

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-C7D		
Lab Sample ID:	JC79221-2	**Date Sampled:**	12/06/18
Matrix:	SO - Soil	**Date Received:**	12/06/18
		Percent Solids:	82.8
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	1.2	0.48	mg/kg	1	12/10/18 12:12	DC	SW846 3060A/7196A
Redox Potential Vs H2	321		mv	1	12/10/18 12:56	EB	ASTM D1498-76M
Solids, Percent	82.8		%	1	12/07/18 16:00	EB	SM2540 G 18TH ED MOD
pH	8.13 J		su	1	12/10/18 12:29	EB	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-C8D		
Lab Sample ID:	JC79221-3	**Date Sampled:**	12/06/18
Matrix:	SO - Soil	**Date Received:**	12/06/18
		Percent Solids:	80.8
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	1.4	0.50	mg/kg	1	12/10/18 12:17	DC	SW846 3060A/7196A
Redox Potential Vs H2	282		mv	1	12/10/18 13:03	EB	ASTM D1498-76M
Solids, Percent	80.8		%	1	12/07/18 16:00	EB	SM2540 G 18TH ED MOD
pH	7.88 J		su	1	12/10/18 12:34	EB	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID: BS-C9D
Lab Sample ID: JC79221-4
Matrix: SO - Soil
Project: PPG Site 107, 18 Chapel Avenue, Jersey City, NJ

Date Sampled: 12/06/18
Date Received: 12/06/18
Percent Solids: 81.5

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	0.98	0.49	mg/kg	1	12/10/18 12:17	DC	SW846 3060A/7196A
Redox Potential Vs H2	273		mv	1	12/10/18 13:05	EB	ASTM D1498-76M
Solids, Percent	81.5		%	1	12/07/18 16:00	EB	SM2540 G 18TH ED MOD
pH	6.99 J		su	1	12/10/18 12:44	EB	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-B8		
Lab Sample ID:	JC79221-5	**Date Sampled:**	12/06/18
Matrix:	SO - Soil	**Date Received:**	12/06/18
		Percent Solids:	84.1
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	0.95	0.48	mg/kg	1	12/10/18 12:17	DC	SW846 3060A/7196A
Redox Potential Vs H2	269		mv	1	12/10/18 13:07	EB	ASTM D1498-76M
Solids, Percent	84.1		%	1	12/07/18 16:00	EB	SM2540 G 18TH ED MOD
pH	8.16 J		su	1	12/10/18 12:57	EB	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID: CS-C8 (2)
Lab Sample ID: JC79221-6
Matrix: SO - Soil
Project: PPG Site 107, 18 Chapel Avenue, Jersey City, NJ

Date Sampled: 12/06/18
Date Received: 12/06/18
Percent Solids: 85.5

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	< 0.47	0.47	mg/kg	1	12/10/18 12:17	DC	SW846 3060A/7196A
Redox Potential Vs H2	271		mv	1	12/10/18 13:09	EB	ASTM D1498-76M
Solids, Percent	85.5		%	1	12/07/18 16:00	EB	SM2540 G 18TH ED MOD
pH	7.67 J		su	1	12/10/18 13:06	EB	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-B9		
Lab Sample ID:	JC79221-7	**Date Sampled:**	12/06/18
Matrix:	SO - Soil	**Date Received:**	12/06/18
		Percent Solids:	75.9
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	1.0	0.53	mg/kg	1	12/10/18 12:17	DC	SW846 3060A/7196A
Redox Potential Vs H2	265		mv	1	12/10/18 13:10	EB	ASTM D1498-76M
Solids, Percent	75.9		%	1	12/07/18 16:00	EB	SM2540 G 18TH ED MOD
pH	7.93 J		su	1	12/10/18 13:08	EB	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID: FB(20181206)
Lab Sample ID: JC79221-1A
Matrix: AQ - Field Blank Soil
Project: PPG Site 107, 18 Chapel Avenue, Jersey City, NJ

Date Sampled: 12/06/18
Date Received: 12/06/18
Percent Solids: n/a

Total Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 6.0	6.0	ug/l	1	12/06/18	12/11/18	ND	SW846 6010D [2]	SW846 3010A [3]
Chromium	< 10	10	ug/l	1	12/06/18	12/07/18	ND	SW846 6010D [1]	SW846 3010A [3]
Nickel	< 10	10	ug/l	1	12/06/18	12/07/18	ND	SW846 6010D [1]	SW846 3010A [3]
Thallium	< 10	10	ug/l	1	12/06/18	12/07/18	ND	SW846 6010D [1]	SW846 3010A [3]
Vanadium	< 50	50	ug/l	1	12/06/18	12/07/18	ND	SW846 6010D [1]	SW846 3010A [3]

(1) Instrument QC Batch: MA45805
(2) Instrument QC Batch: MA45821
(3) Prep QC Batch: MP11122

RL = Reporting Limit

Report of Analysis

Client Sample ID:	FB(20181206)		
Lab Sample ID:	JC79221-1A	**Date Sampled:**	12/06/18
Matrix:	AQ - Field Blank Soil	**Date Received:**	12/06/18
		Percent Solids:	n/a
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	< 0.020	0.020	mg/l	1	12/07/18 18:10	ND	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-C7D		
Lab Sample ID:	JC79221-2A	**Date Sampled:**	12/06/18
Matrix:	SO - Soil	**Date Received:**	12/06/18
		Percent Solids:	82.8
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 2.4	2.4	mg/kg	1	12/07/18	12/07/18	ND	SW846 6010D [1]	SW846 3050B [2]
Chromium	17.9	1.2	mg/kg	1	12/07/18	12/07/18	ND	SW846 6010D [1]	SW846 3050B [2]
Nickel	12.1	4.7	mg/kg	1	12/07/18	12/07/18	ND	SW846 6010D [1]	SW846 3050B [2]
Thallium	< 1.2	1.2	mg/kg	1	12/07/18	12/07/18	ND	SW846 6010D [1]	SW846 3050B [2]
Vanadium	16.8	5.9	mg/kg	1	12/07/18	12/07/18	ND	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA45805
(2) Prep QC Batch: MP11125

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-C7D		
Lab Sample ID:	JC79221-2A	**Date Sampled:**	12/06/18
Matrix:	SO - Soil	**Date Received:**	12/06/18
		Percent Solids:	82.8
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	16.7	1.7	mg/kg	1	12/10/18 12:12	DC	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-C8D		
Lab Sample ID:	JC79221-3A	**Date Sampled:**	12/06/18
Matrix:	SO - Soil	**Date Received:**	12/06/18
		Percent Solids:	80.8
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony [a]	< 4.9	4.9	mg/kg	2	12/07/18	12/07/18	ND	SW846 6010D [1]	SW846 3050B [2]
Chromium	92.3	1.2	mg/kg	1	12/07/18	12/07/18	ND	SW846 6010D [1]	SW846 3050B [2]
Nickel	14.5	4.9	mg/kg	1	12/07/18	12/07/18	ND	SW846 6010D [1]	SW846 3050B [2]
Thallium [a]	< 2.4	2.4	mg/kg	2	12/07/18	12/07/18	ND	SW846 6010D [1]	SW846 3050B [2]
Vanadium	35.1	6.1	mg/kg	1	12/07/18	12/07/18	ND	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA45805
(2) Prep QC Batch: MP11125

(a) Elevated detection limit due to dilution required for high interfering element.

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-C8D		
Lab Sample ID:	JC79221-3A	**Date Sampled:**	12/06/18
Matrix:	SO - Soil	**Date Received:**	12/06/18
		Percent Solids:	80.8
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	90.9	1.7	mg/kg	1	12/10/18 12:17	DC	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-C9D		
Lab Sample ID:	JC79221-4A	**Date Sampled:**	12/06/18
Matrix:	SO - Soil	**Date Received:**	12/06/18
		Percent Solids:	81.5
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 2.5	2.5	mg/kg	1	12/07/18	12/07/18	ND	SW846 6010D [1]	SW846 3050B [2]
Chromium	11.7	1.3	mg/kg	1	12/07/18	12/07/18	ND	SW846 6010D [1]	SW846 3050B [2]
Nickel	14.6	5.1	mg/kg	1	12/07/18	12/07/18	ND	SW846 6010D [1]	SW846 3050B [2]
Thallium	< 1.3	1.3	mg/kg	1	12/07/18	12/07/18	ND	SW846 6010D [1]	SW846 3050B [2]
Vanadium	17.6	6.3	mg/kg	1	12/07/18	12/07/18	ND	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA45805
(2) Prep QC Batch: MP11125

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-C9D		
Lab Sample ID:	JC79221-4A	**Date Sampled:**	12/06/18
Matrix:	SO - Soil	**Date Received:**	12/06/18
		Percent Solids:	81.5
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	10.7	1.8	mg/kg	1	12/10/18 12:17	DC	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID: BS-B8
Lab Sample ID: JC79221-5A
Matrix: SO - Soil
Project: PPG Site 107, 18 Chapel Avenue, Jersey City, NJ

Date Sampled: 12/06/18
Date Received: 12/06/18
Percent Solids: 84.1

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 2.5	2.5	mg/kg	1	12/07/18	12/07/18	ND	SW846 6010D [1]	SW846 3050B [2]
Chromium	14.4	1.2	mg/kg	1	12/07/18	12/07/18	ND	SW846 6010D [1]	SW846 3050B [2]
Nickel	8.5	4.9	mg/kg	1	12/07/18	12/07/18	ND	SW846 6010D [1]	SW846 3050B [2]
Thallium	< 1.2	1.2	mg/kg	1	12/07/18	12/07/18	ND	SW846 6010D [1]	SW846 3050B [2]
Vanadium	24.5	6.1	mg/kg	1	12/07/18	12/07/18	ND	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA45805
(2) Prep QC Batch: MP11125

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-B8		
Lab Sample ID:	JC79221-5A	**Date Sampled:**	12/06/18
Matrix:	SO - Soil	**Date Received:**	12/06/18
		Percent Solids:	84.1
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	13.5	1.7	mg/kg	1	12/10/18 12:17	DC	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID: CS-C8 (2)
Lab Sample ID: JC79221-6A
Matrix: SO - Soil
Project: PPG Site 107, 18 Chapel Avenue, Jersey City, NJ

Date Sampled: 12/06/18
Date Received: 12/06/18
Percent Solids: 85.5

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony [a]	< 4.6	4.6	mg/kg	2	12/07/18	12/07/18	ND	SW846 6010D [1]	SW846 3050B [2]
Chromium	12.1	1.2	mg/kg	1	12/07/18	12/07/18	ND	SW846 6010D [1]	SW846 3050B [2]
Nickel	9.6	4.6	mg/kg	1	12/07/18	12/07/18	ND	SW846 6010D [1]	SW846 3050B [2]
Thallium [a]	< 5.8	5.8	mg/kg	5	12/07/18	12/07/18	ND	SW846 6010D [1]	SW846 3050B [2]
Vanadium	16.5	5.8	mg/kg	1	12/07/18	12/07/18	ND	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA45805
(2) Prep QC Batch: MP11125

(a) Elevated detection limit due to dilution required for high interfering element.

RL = Reporting Limit

Report of Analysis

Client Sample ID:	CS-C8 (2)		
Lab Sample ID:	JC79221-6A	**Date Sampled:**	12/06/18
Matrix:	SO - Soil	**Date Received:**	12/06/18
		Percent Solids:	85.5
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	12.1	1.7	mg/kg	1	12/10/18 12:17	DC	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID: BS-B9
Lab Sample ID: JC79221-7A
Matrix: SO - Soil
Project: PPG Site 107, 18 Chapel Avenue, Jersey City, NJ

Date Sampled: 12/06/18
Date Received: 12/06/18
Percent Solids: 75.9

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 2.6	2.6	mg/kg	1	12/07/18	12/07/18	ND	SW846 6010D [1]	SW846 3050B [2]
Chromium	12.7	1.3	mg/kg	1	12/07/18	12/07/18	ND	SW846 6010D [1]	SW846 3050B [2]
Nickel	9.2	5.3	mg/kg	1	12/07/18	12/07/18	ND	SW846 6010D [1]	SW846 3050B [2]
Thallium	< 1.3	1.3	mg/kg	1	12/07/18	12/07/18	ND	SW846 6010D [1]	SW846 3050B [2]
Vanadium	16.3	6.6	mg/kg	1	12/07/18	12/07/18	ND	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA45805
(2) Prep QC Batch: MP11125

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-B9		
Lab Sample ID:	JC79221-7A	**Date Sampled:**	12/06/18
Matrix:	SO - Soil	**Date Received:**	12/06/18
		Percent Solids:	75.9
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	11.7	1.8	mg/kg	1	12/10/18 12:17	DC	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

ARCADIS Design & Consultancy for natural and built assets

PPG Industries

DATA QUALITY ASSESSMENT

Site 107 Fashionland

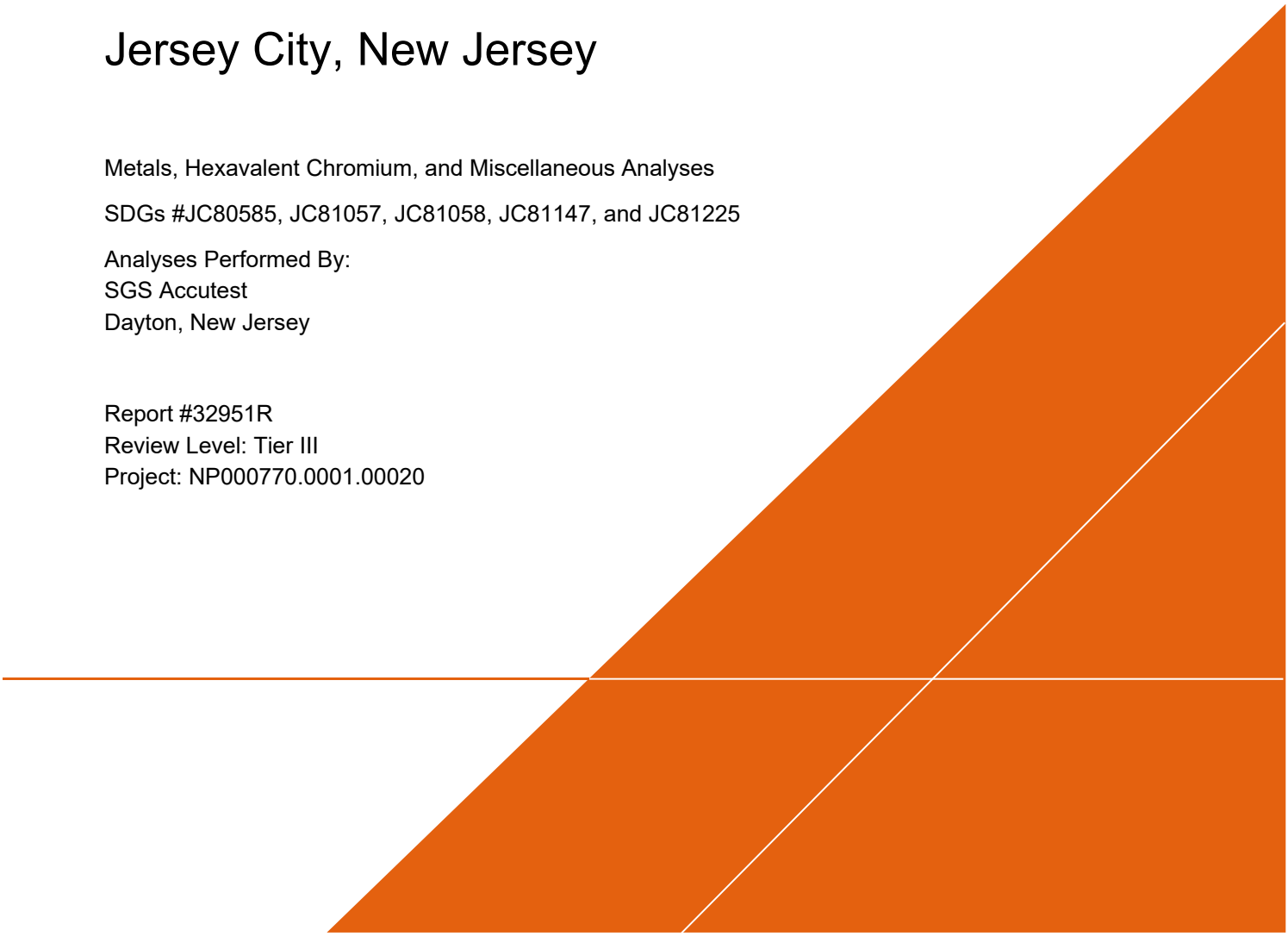
Jersey City, New Jersey

Metals, Hexavalent Chromium, and Miscellaneous Analyses

SDGs #JC80585, JC81057, JC81058, JC81147, and JC81225

Analyses Performed By:
SGS Accutest
Dayton, New Jersey

Report #32951R
Review Level: Tier III
Project: NP000770.0001.00020



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Groups (SDGs) # JC80585, JC81057, JC81058, JC81147, and JC81225 for samples collected in association with the PPG Industries Site 107 Fashionland, Jersey City, New Jersey Site. The review was conducted as a Tier III evaluation and included review of data package completeness. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

SDG	Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis		
						Cr VI	MET	MISC
JC80585	FB(20181228)	JC80585-1	Water	12/28/2018		X	X	X
	BS-114	JC80585-2	Soil	12/28/2018		X	X	X
JC81057	FB(20190109)	JC81057-1	Water	1/9/2019		X	X	X
	SW-A0(0.0-0.5)	JC81057-2	Soil	1/9/2019		X	X	X
	SW-A0(2.0-2.5)	JC81057-3	Soil	1/9/2019		X	X	X
	SW-A0(4.0-4.5)	JC81057-4	Soil	1/9/2019		X	X	X
	SW-A0(6.0-6.5)	JC81057-5	Soil	1/9/2019		X	X	X
	SW-A0(6.5-7.0)	JC81057-6	Soil	1/9/2019		X	X	X
JC81058	FB(20190108)	JC81058-1	Water	1/8/2019		X	X	X
	BS-A5	JC81058-2	Soil	1/8/2019		X	X	X
	107_M020N	JC81058-3	Soil	1/8/2019		X	X	X
JC81147	FB(20190110)-A1	JC81147-1	Water	1/10/2019		X	X	X
	BS-A8	JC81147-2	Soil	1/10/2019		X	X	X
	BS-A9	JC81147-3	Soil	1/10/2019		X	X	X
	BS-A9U	JC81147-4	Soil	1/10/2019		X	X	X
	DUP-1RR(20190110)	JC81147-5	Soil	1/10/2019	BS-A8	X	X	X
JC81225	FB(20190111)-A1	JC81225-1	Water	1/11/2019		X	X	X
	BS-A10	JC81225-2	Soil	1/11/2019		X	X	X
	BS-A11	JC81225-3	Soil	1/11/2019		X	X	X
	BS-A12	JC81225-4	Soil	1/11/2019		X	X	X
	BS-A12S	JC81225-5	Soil	1/11/2019		X	X	X

Notes:

1. Metals include antimony, chromium, nickel, thallium, and vanadium. Trivalent chromium is reported by calculation (Chromium) – (Hexavalent Chromium).
2. Cr VI is hexavalent chromium.

3. Miscellaneous parameters include pH and redox potential.
4. SDGs #JC81057, JC81147, and JC81225: Miscellaneous parameters for samples SW-A0(2.0-2.5), BS-A9, and BS-A12S also include ferrous iron, sulfide screen, and total organic carbon (TOC).

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of QA or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

Note:
QA - Quality Assurance

INORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Methods 6010C, 7196A, and 9045D; Standard Methods (SM) 4500H+B and SM4500S2-A; Lloyd Kahn; and ASTM D1498-76 and D3872-86. Data were reviewed in accordance with USEPA Region 2 SOP HW-2b, Revision 15 (December 2012); New Jersey Division of Remediation Management and Response Standard Operating Procedure for Analytical Data Validation of Hexavalent Chromium (September 2009); New Jersey Department of Environmental Protection Data Quality Assessment and Data Usability Evaluation Technical Guidance (April 2014); Field Sampling Plan/Quality Assurance Project Plan, PPG Non-Residential and Residential Chromium Sites, Hudson County, New Jersey (AECOM, June 2010); and Arcadis Quality Assurance Project Plan – Addendum, Site 107 Fashionland, Jersey City, New Jersey (Arcadis, June 2018).

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and that it was already subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with the USEPA National Functional Guidelines:

- Concentration (C) Qualifiers
  - U The analyte was analyzed for but not detected. The associated value is the analyte instrument detection limit.
  - B The reported value was obtained from a reading less than the reporting limit (RL), but greater than or equal to the method detection limit (MDL).
- Quantitation (Q) Qualifiers
  - E The reported value is estimated due to the presence of interference.
  - N Spiked sample recovery is not within control limits.
  - * Duplicate analysis is not within control limits.
- Validation Qualifiers
  - J The analyte was positively identified; however, the associated numerical value is an estimated concentration only.
  - J+ The result is an estimated quantity, but the result may be biased high.
  - J- The result is an estimated quantity, but the result may be biased low.
  - UJ The analyte was not detected above the reporting limit. However, the reported limit is approximate and may or may not represent the actual limit of detection.
  - UB Analyte considered non-detect at the listed value due to associated blank contamination.
  - R The data are unusable. The sample results are rejected due to serious deficiencies in meeting Quality Control (QC) critieria. The analyte may or may not be present in the sample.

Two facts should be noted by all data users. First, the “R” flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. “R” values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

METALS ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 6010C	Water	180 days from collection to analysis	Preserved to a pH of less than 2; Cool to <6°C
	Soil	180 days from collection to analysis	Cool to <6°C

All samples were analyzed within the specified holding times.

2. Blank Contamination

Quality assurance (QA) blanks (i.e., method and rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank is calculated for QA blanks containing concentrations greater than the method detection limit (MDL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Analytes were not detected above the MDL in the associated blanks; therefore, detected sample results were not associated with blank contamination.

3. Calibration

Satisfactory instrument calibration is established to provide that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument's continuing performance is satisfactory.

3.1 Initial Calibration and Continuing Calibration

The correct number and type of standards were analyzed. The correlation coefficient of the initial calibration was greater than 0.998 and all initial calibration verification standard and continuing calibration verification standard recoveries were within control limits of 90% to 110%.

All continuing calibration verification standard recoveries were within the control limit.

3.2 Low-Level Calibration Verification

The low-level initial and continuing calibration check standard serves to verify the linearity of calibration of the analysis at the reporting limit.

All RL standard recoveries were within control limits of 70% to 130% (50% to 150% for antimony and thallium).

3.3 ICP Interference Control Sample (ICS)

The ICS verifies the laboratories interelement and background correction factors.

All ICS exhibited recoveries within the control limits of 80% to 120%.

4. Matrix Spike/Matrix Spike Duplicate (MS/MSD)/Laboratory Duplicate Analysis

MS/MSD and laboratory duplicate data are used to assess the precision and accuracy of the analytical method.

4.1 MS/MSD Analysis

All metal analytes must exhibit a percent recovery within the established acceptance limits of 75% to 125%. The MS/MSD recovery control limits do not apply for MS/MSD performed on sample locations where the analyte's concentration detected in the parent sample exceeds the MS/MSD concentration by a factor of four or greater.

SDGs #JC80585, JC81057, JC81058, and JC81225: The MS/MSD analysis was not performed using a sample from these SDGs.

SDG #JC81147: The MS/MSD analysis performed on sample locations BS-H11D exhibited recoveries within the control limits with the exception of the analytes presented in the table below.

Sample Location	Analyte	MS Recovery	MSD Recovery
BS-A9	Antimony	58.4%	61.7%

The criteria used to evaluate MS/MSD recoveries are presented in the following table. In the case of an MS/MSD deviation, the sample results are qualified. The qualifications are applied to all sample results associated with the sample preparation batch.

Control limit	Sample Result	Qualification
MS/MSD percent recovery 30% to 74%	Non-detect	UJ-
	Detect	J-
MS/MSD percent recovery < 30%	Non-detect	R
	Detect	J-
MS/MSD percent recovery > 125%	Non-detect	No Action
	Detect	J+

4.2 Laboratory Duplicate Analysis

The laboratory duplicate relative percent difference (RPD) criterion is applied when parent and duplicate sample concentrations are greater than or equal to 5 times the RL. A control limit of 20% for water matrices and 35% for soil matrices is applied when the criteria above is true. In the instance when the

parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of ± the RL is applied.

SDGs #JC80585, JC81057, JC81058, and JC81225: The laboratory duplicate analysis was not performed using a sample from these SDGs.

SDG #JC81147: MS/MSD analysis was performed in replacement of the laboratory duplicate analysis using sample BS-A9. The MS/MSD recoveries exhibited acceptable RPDs.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 50% for soil matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of three times the RL is applied for soil matrices.

Results for duplicate samples are summarized in the following table.

Sample ID/Duplicate ID	Analyte	Sample Result	Duplicate Result	RPD
BS-A8 / DUP-1RR(20190110)	Chromium	76.1	55.3	31.7%
	Trivalent Chromium	74.5	52.1	35.4%
	Nickel	8.5	8.5	AC
	Vanadium	17.9	18.2	

Notes:

AC = Acceptable

The differences in the results between the parent sample BS-A8 and field duplicate sample DUP-1RR(20190110) were acceptable.

6. Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD) Analysis

The LCS/LCSD analysis is used to assess the precision and accuracy of the analytical method independent of matrix interferences. The analytes associated with the LCS/LCSD analysis must exhibit a percent recovery between the control limits of 80% and 120%. The RPDs between the LCS and LCSD results must be within the laboratory-established acceptance limits.

The LCS/LCSD analysis exhibited recoveries and RPDs within the control limits.

7. Serial Dilution

The serial dilution analysis is used to assess if a significant physical or chemical interference exists due to sample matrix. Analytes exhibiting concentrations greater than 10 times the RL in the undiluted sample are evaluated to determine if matrix interference exists. These analytes are required to have less than a 10% difference (%D) between sample results from the undiluted (parent) sample and results associated with the same sample analyzed with a five-fold dilution.

SDGs #JC80585, JC81057, JC81058, and JC81225: The serial dilution analysis was not performed using a sample from these SDGs.

SDG #JC81147: All serial dilutions were within control limits, with the exception of the analytes presented in the following table.

Sample Locations	Analytes	Serial Dilution (%D)
BS-A9	Chromium	10.1%

The criteria used to evaluate the serial dilution are presented in the following table. In the case of a serial dilution deviation, the sample results are qualified as documented in the table below. The qualifications are applied to all sample results associated with the sample preparation batch.

Control Limit	Sample Result	Qualification
> 10%	Non-detect	UJ
	Detect	J

8. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR METALS

METALS: SW-846 6010C	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Inductively Coupled Plasma-Atomic Emission Spectrometry (ICP-AES)					
Tier II Validation					
Holding Times		X		X	
Reporting limits (units)		X		X	
Blanks					
A. Instrument Blanks		X		X	
B. Method Blanks		X		X	
C. Equipment/Field Blanks		X		X	
Laboratory Control Sample (LCS)		X		X	
Laboratory Control Sample Duplicate (LCSD)		X		X	
LCS/LCSD Precision (RPD)		X		X	
Matrix Spike (MS) %R		X	X		
Matrix Spike Duplicate (MSD) %R		X	X		
MS/MSD Precision (RPD)		X		X	
Field/Lab Duplicate (RPD)		X		X	
ICP Serial Dilution %D		X	X		
Total vs. Dissolved	X				X
Reporting Limit Verification		X		X	
Tier III Validation					
Initial Calibration Verification		X		X	
Continuing Calibration Verification		X		X	
CRDL Standard Recovery		X		X	
ICP Interference Check		X		X	
ICP-MS Internal Standards	X				X
Transcription/calculations acceptable		X		X	
Raw Data	X				X
Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%R Percent recovery

RPD Relative percent difference

%D Percent difference

HEXAVALENT CHROMIUM ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 7196A	Water	24 hours from collection to analysis	Cool to <6°C
SW-846 3060A/ 7196A	Soil	30 days from collection to extraction; 7 days from extraction to analysis	Cool to <6°C

The analyses that exceeded the holding are presented in the following table.

Sample Locations	Method	Holding Time	Criteria
FB(20190108)	SW-846 7196A	Analysis: 35 hours	< 24 hours

Sample results were qualified as specified in the table below. All other holding times were met. Sample FB(20190108) was received by the laboratory past the required 24 hour holding time.

Criteria	Qualification	
	Detected Analytes	Non-detect Analytes
Analysis completed less than two times holding time	J	UJ

2. Blank Contamination

Quality assurance (QA) blanks (i.e., method and rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank is calculated for QA blanks containing concentrations greater than the method detection limit (MDL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Analytes were not detected above the MDL in the associated blanks; therefore, detected sample results were not associated with blank contamination.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

The correct number and type of standards were analyzed. The correlation coefficient of the initial calibration was greater than 0.995 and all calibration verification standard recoveries were within control limits of 90% to 110%.

4. Matrix Spike (MS)/Post-Digestion Spike (PDS)/Laboratory Duplicate Analysis

MS, PDS, and laboratory duplicate data are used to assess the precision and accuracy of the analytical method.

4.1 MS Analysis

Soluble and insoluble spike sample analyses are designed to provide information about the effect of the sample matrix on the digestion and measurement methodology. The insoluble spike is used to evaluate the dissolution during the digestion process. Hexavalent chromium must exhibit a percent recovery within the established acceptance limits of 75% to 125% in both the soluble and insoluble spiked analyses. The control limits do not apply when the parent sample concentration exceeds the spike amount by a factor of four or greater.

SDG #JC81058: The MS analysis performed on sample location 107_M020N in association with the insoluble and soluble hexavalent chromium analysis exhibited recoveries within the control limits.

SDGs #JC80585, JC81057, and JC81225: The MS analysis performed on sample locations BS-114, SW-A0(2.0-2.5), and BS-A12S in association with the insoluble hexavalent chromium analysis exhibited recoveries within the control limits.

SDGs #JC80585, JC81057, JC81147, and JC81225: The MS analysis performed on sample locations BS-114, SW-A0(2.0-2.5), BS-A9, and BS-A12S exhibited spike recoveries less than the lower control limits as presented in the table below.

Sample Location	Analyte	Initial Spike Recovery	Reanalysis Spike Recovery
BS-114	Hexavalent Chromium, Soluble	< 50%	AC (78.6%)
SW-A0(2.0-2.5)	Hexavalent Chromium, Soluble	< 50%	57.2%
BS-A9	Hexavalent Chromium, Insoluble	68.9%	AC (84.8%)
	Hexavalent Chromium, Soluble	< 50%	< 50%
BS-A12S	Hexavalent Chromium, Soluble	55.7%	< 50%

Notes:

AC = Acceptable

The criteria used to evaluate spike recoveries are presented in the following table. The qualifications are applied to all sample results associated with the sample preparation batch. In the event of a recovery outside of the control limits, the MS must be reanalyzed.

Control limit	Sample Result	Qualification[1]
Spike recovery ≥ 50% but < 75%	Non-detect	UJ-
	Detect	J-
Spike recovery < 50%	Non-detect	R
	Detect	R
Spike recovery > 125%	Non-detect	No Action
Spike recovery > 125% but ≤ 150%	Detect	J+
Spike recovery > 150%	Detect	R

Notes:

[1] If recoveries are < 50% or > 150% for both insoluble and soluble spikes, associated data will be rejected ("R"); otherwise qualify associated data if one of the spikes is outside the < 50% or > 150% limits.

SDG #JC80585: The reanalysis of the field sample is usable. No qualification of the sample results was required.

SDGs #JC81057, JC81147, and JC81225: The original analyses of the field samples are usable with appropriate qualification. No sample results were rejected.

4.2 Post-Digestion Spike (PDS) Analysis

The PDS analysis is designed to verify that neither a reducing condition nor a chemical interference is affecting the analysis. This is accomplished by analyzing a second aliquot of the pH-adjusted filtrate that has been spiked with hexavalent chromium. The PDS must exhibit a percent recovery within the method acceptance limits of 85% to 115%.

SDGs #JC80585, JC81057, JC81058, JC81147, and JC81225: The PDS analysis performed on sample locations BS-114, SW-A0(2.0-2.5), 107_M020N, BS-A9, and BS-A12S exhibited recoveries within the control limits.

4.3 Laboratory Duplicate Analysis

The laboratory duplicate relative percent difference (RPD) criterion is applied when parent and duplicate sample concentrations are greater than or equal to four times the RL. A control limit of 20% is applied when the criteria above is true. In the instance when the parent and/or duplicate sample concentrations are less than or equal to four times the RL, a control limit of ± the RL is used.

SDGs #JC80585, JC81057, JC81058, JC81147, and JC81225: The laboratory duplicate analysis performed on sample locations BS-114, SW-A0(2.0-2.5), 107_M020N, BS-A9, and BS-A12S exhibited results within the control limit.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 50% for soil matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of three times the RL is applied for soil matrices.

Results for duplicate samples are summarized in the following table.

Sample ID/Duplicate ID	Analyte	Sample Result	Duplicate Result	RPD
BS-A8 / DUP-1RR(20190110)	Hexavalent Chromium	1.6	3.2	NC

Notes:

NC = Not compliant

The difference in the hexavalent chromium results between the parent sample BS-A8 and field duplicate sample DUP-1RR(20190110) was not in agreement. The associated results were qualified as estimated.

6. Laboratory Control Sample (LCS) Analysis

The LCS analysis is used to assess the precision and accuracy of the analytical method independent of matrix interferences. The analytes associated with the LCS analysis must exhibit a percent recovery between the control limits of 80% and 120%.

The LCS analysis exhibited recoveries within the control limits.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR HEXAVALENT CHROMIUM

HEXAVALENT CHROMIUM: SW-846 7196A	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Spectrophotometer					
Tier II Validation					
Holding Times		X	X		
Reporting limits (units)		X		X	
Blanks					
A. Instrument Blanks		X		X	
B. Method Blanks		X		X	
C. Equipment/Field Blanks		X		X	
Laboratory Control Sample (LCS)		X		X	
Matrix Spike (MS) %R		X	X		
Matrix Spike Duplicate (MSD) %R	X				X
MS/MSD Precision (RPD)	X				X
Post Digestion Spike %R		X		X	
Field/Lab Duplicate (RPD)		X	X		
Dilution Factor		X		X	
Tier III Validation					
Initial calibration %RSD or correlation coefficient		X		X	
Continuing calibration %R		X		X	
Raw Data		X		X	
Transcription/calculation errors present		X		X	
Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%R Percent recovery

RPD Relative percent difference

%RSD Relative percent deviation

GENERAL CHEMISTRY ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
pH by SM4500H+B	Water	QAPP: 24 hours of receipt at laboratory	Cool to <6°C
pH by SW846 9045D	Soil	QAPP: 24 hours of receipt at laboratory	Cool to <6°C
Oxidation-Reduction Potential by ASTM D1498-76	Water	Not applicable	Cool to <6°C
Oxidation-Reduction Potential (Redox) by ASTM D1498-76	Soil	Measure immediately after creating leachate	Cool to <6°C
Ferrous Iron by ASTM D3872-86	Soil	24 hours from collection to analysis	Cool to <6°C
Sulfide Screen by SM4500S2-A	Soil	7 days from collection to analysis	Cool to <6°C
Total Organic Carbon (TOC) by Lloyd Kahn	Soil	14 days from collection to analysis	Cool to <6°C

The analyses that exceeded the holding are presented in the following table.

Sample Locations	Method	Holding Time	Criteria
BS-A5 107_M02N	SW846 9045D	Analysis: 2 days	< 24 hours of receipt by laboratory
BS-114 BS-A10 BS-A11 BS-A12 BS-A12S		Analysis: 3 days	
BS-A9	ASTM D3872-86	Analysis: 7 days	< 24 hours from collection
SW-A0(2.0-2.5)		Analysis: 8 days	
BS-A12S		Analysis: 12 days	
SW-A0(2.0-2.5)	SM4500S2-A	Analysis: 8 days	7 days from collection
BS-A12S		Analysis: 12 days	

Sample results were qualified as specified in the table below. All other holding times were met.

Criteria	Qualification	
	Detected Analytes	Non-detect Analytes
Analysis completed less than two times holding time	J	UJ
Analysis completed greater than two times holding time	J	R

2. Blank Contamination

Quality assurance (QA) blanks (i.e., method and rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank is calculated for QA blanks containing concentrations greater than the method detection limit (MDL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Method blank analysis is not applicable for Redox and pH analyses.

Ferrous iron, sulfide, and TOC were not detected above the MDL in the associated blanks; therefore, detected sample results were not associated with blank contamination.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

The correct number and type of standards were analyzed. All buffer check results were within acceptance limits.

4. Laboratory Duplicate Analysis

Laboratory duplicate data are used to assess the precision of the analytical method. The laboratory duplicate relative percent difference (RPD) criterion is applied when parent and duplicate sample concentrations are greater than or equal to 5 times the RL. A control limit of 20% for water matrices and 35% for soil matrices is applied when the criteria above is true. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of ± the RL is applied.

SDGs #JC80585 and JC81058: The laboratory duplicate analysis was not performed using a sample from these SDGs.

SDGs #JC81057, JC81147, and JC81225: The laboratory duplicate analysis performed on sample locations SW-A0(2.0-2.5), BS-A9, and BS-A12S exhibited results within the control limit.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 50% for soil matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of three times the RL is applied for soil matrices.

Results for duplicate samples are summarized in the following table.

Sample ID/Duplicate ID	Analyte	Sample Result	Duplicate Result	RPD
BS-A8 / DUP-1RR(20190110)	Redox	333	306	8.5%
	pH	6.03	6.04	0.2%

The differences in the results between the parent sample BS-A8 and field duplicate sample DUP-1RR(20190110) were acceptable.

6. Laboratory Control Sample (LCS) Analysis

The LCS analysis is used to assess the precision and accuracy of the analytical method independent of matrix interferences. The analytes associated with the LCS analysis must exhibit a percent recovery between the control limits of 80% and 120%.

LCS results for redox potential, pH, and sulfide screen were not reported in the analytical report.

The LCS analysis performed in association with ferrous iron and TOC exhibited recoveries within the control limits.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR GENERAL CHEMISTRY

General Chemistry: SM4500H+B, SW846 9045D, ASTM D1498-76	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Miscellaneous Instrumentation					
Tier II Validation					
Holding times		X	X		
Reporting limits (units)		X		X	
Blanks					
A. Instrument Blanks		X		X	
B. Method blanks		X		X	
C. Equipment blanks		X		X	
Laboratory Control Sample (LCS) %R		X		X	
Laboratory Control Sample Duplicate (LCSD) %R	X				X
LCS/LCSD Precision (RPD)	X				X
Matrix Spike (MS) %R	X				X
Matrix Spike Duplicate (MSD) %R	X				X
MS/MSD Precision (RPD)	X				X
Field/Lab Duplicate (RPD)		X		X	
Dilution Factor		X		X	
Tier III Validation					
Initial calibration %RSD or correlation coefficient	X				X
Continuing calibration %R	X				X
Raw Data		X		X	
Transcription/calculation errors present		X		X	
Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%R Percent recovery

RPD Relative percent difference

VALIDATION PERFORMED BY: Jennifer Singer

SIGNATURE: 

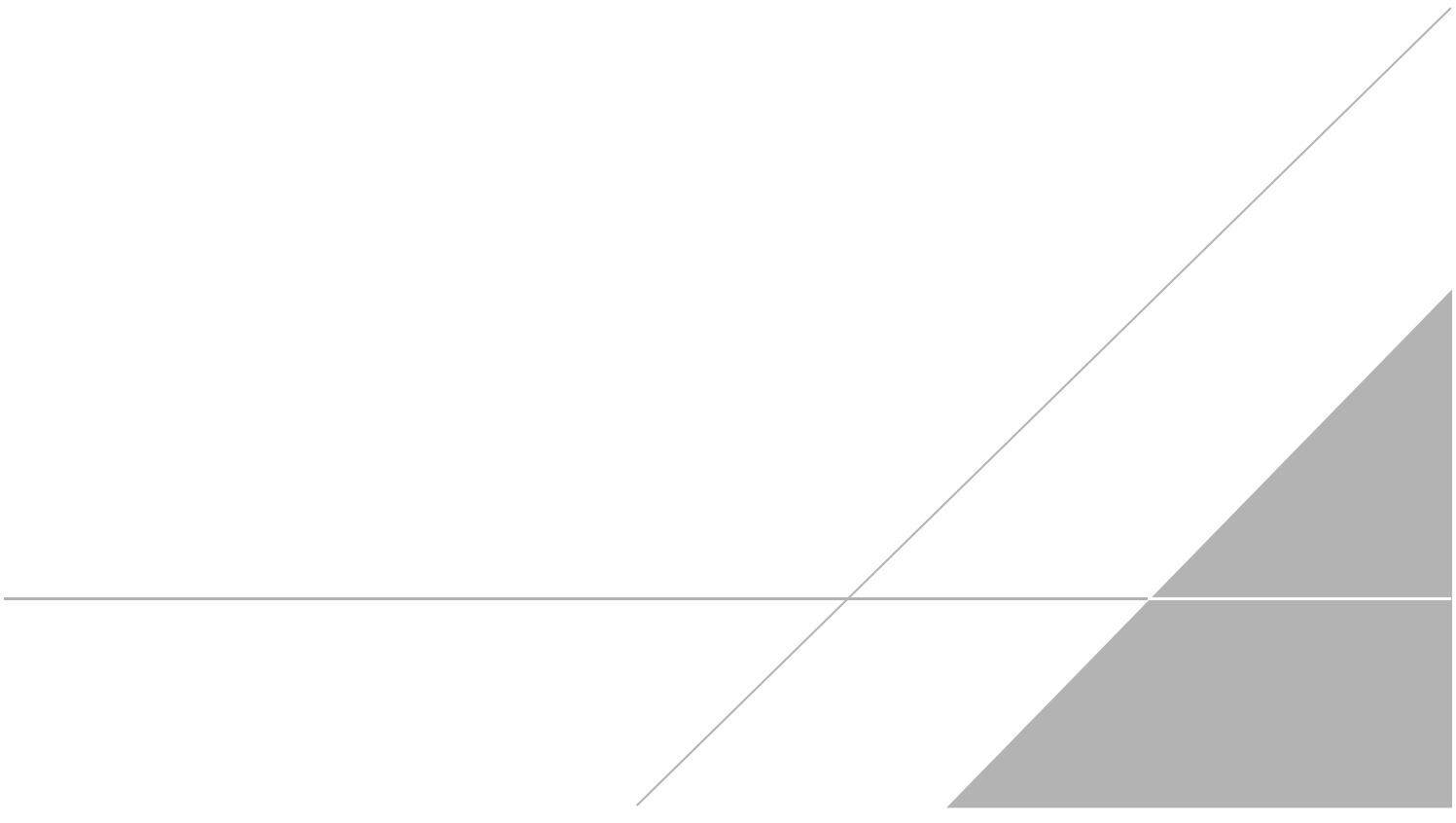
DATE: June 4, 2019

PEER REVIEW: Dennis Capria

DATE: June 27, 2019

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS



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FB

CHAIN OF CUSTODY

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FED-EX Tracking #
Bottle Order Control #
SGS Quote #
SGS Job # JC80585

Client / Reporting Information	Project Information	
Company Name: Arcadis	Project Name: PPG Site 107 (Jersey City)	
Street Address: 10 Friends Lane, Suite 200	Street: 18 Chapel Avenue	Billing Information (If different from Report to)
City: Newtown, State: PA, Zip: 18440	City: Jersey City, State: NJ	Company Name
Project Contact: Matthew Bell, E-mail	Project #: NP000770.0001	Street Address
Phone #: 610.755.7080	Client Purchase Order #	City, State, Zip
Sampler(s) Name(s): C Buchanan, Phone #	Project Manager: Jim Mclaughlin, Jr.	Attention:

Requested Analysis: Total Chromium, Hexavalent Chromium, Trivalent Chromium, Antimony, Nickel, Thallium, Vanadium

Matrix Codes: DW - Drinking Water; GW - Ground Water; WW - Water; SW - Surface Water; SO - Soil; SL - Sludge; SED - Sediment; OI - Oil; LIQ - Other Liquid; AIR - Air; SOL - Other Solid; WP - Wipe; FB - Field Blank; EB - Equipment Blank; RB - Rinse Blank; TB - Trip Blank

SGS Sample #	Field ID / Point of Collection	MEOH/DI Vial #	Date	Time	Sampled by	Grab (G) Comp (C)	Matrix	# of bottles	HCl	NaOH	HNO3	H2SO4	NONE	DI Water	MEOH	ENCORE	Total Chromium	Hexavalent Chromium	Trivalent Chromium	Antimony	Nickel	Thallium	Vanadium	LAB USE ONLY
1	~~FB20181228~~ (20181228)		12/28/18	1200	CB	G	FB	4			2		2				X	X	X	X	X	X	X	
2	BS-I14		12/28/18	0915	CB	G	SO	1					1				X	X	X	X	X	X	X	A8 G47 D60

Turn Around Time (Business Days)

- [ ] 10 Business Days
- [ ] 5 Business Days
- [ ] 3 Business Days*
- [x] 2 Business Days*
- [ ] 1 Business Day*
- [ ] Other

Approved By (SGS PM): / Date:

All data available via Lablink
* Approval needed for 1-3 Business Day TAT

Deliverable

- [ ] Commercial "A" (Level 1)
- [ ] Commercial "B" (Level 2)
- [ ] NJ Reduced (Level 3)
- [ ] Full Tier I (Level 4)
- [ ] Commercial "C"
- [ ] NJ DKQP
- [ ] NYASP Category A
- [ ] NYASP Category B
- [ ] MA MCP Criteria
- [ ] CT RCP Criteria
- [ ] State Forms
- [x] EDD Format _Equis_
- [ ] DOD-QSM5

Commercial "A" = Results only; Commercial "B" = Results + QC Summary
Commercial "C" = Results + QC Summary + Partial Raw data

Comments / Special Instructions

INITIAL ASSESSMENT 3A(N)
LABEL VERIFICATION

http://www.sgs.com/en/terms-and-conditions

Sample Custody must be documented below each time samples change possession, including courier delivery.

Relinquished by:	Date / Time:	Received By:	Relinquished By:	Date / Time:	Received By:
1 [signature]	12/28/18 1520	1 Robert Dracuboas	2 Robert Dracuboas	12-28-18 1609	2 [signature]
3		3	4		4
5		5	Custody Seal # 18438	☐ Intact ☐ Not intact / Preserved where applicable ☐ Absent ☐	Therm. ID: On Ice X IR Cooler Temp. °C 3.1 °C

SGS Post Ex Sample COCs 20181217

JC80585: Chain of Custody
Page 1 of 3

5.2
5

Report of Analysis

Client Sample ID:	FB(20181228)		
Lab Sample ID:	JC80585-1	**Date Sampled:**	12/28/18
Matrix:	AQ - Field Blank Soil	**Date Received:**	12/28/18
		Percent Solids:	n/a
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	< 0.010	0.010	mg/l	1	12/28/18 18:17	LS	SW846 7196A
Redox Potential Vs H2	590		mv	1	12/31/18 10:54	RB	ASTM D1498-76
pH [a]	6.65		su	1	12/28/18 16:45	TH	SM4500H+ B-11

(a) Sample received out of holding time for pH analysis.

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-114		
Lab Sample ID:	JC80585-2	**Date Sampled:**	12/28/18
Matrix:	SO - Soil	**Date Received:**	12/28/18
		Percent Solids:	66.2
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
~~Chromium, Hexavalent~~	~~0.97~~	~~0.60~~	~~mg/kg~~	~~1~~	~~12/31/18 14:55~~	~~DC~~	~~SW846 3060A/7196A~~
Redox Potential Vs H2	316		mv	1	12/31/18 14:16	RB	ASTM D1498-76M
Solids, Percent	66.2		%	1	12/29/18 10:00	RC	SM2540 G 18TH ED MOD
pH	8.42 J		su	1	12/31/18 13:50	RB	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-114		
Lab Sample ID:	JC80585-2R	**Date Sampled:**	12/28/18
Matrix:	SO - Soil	**Date Received:**	12/28/18
		Percent Solids:	66.2
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	< 0.60	0.60	mg/kg	1	01/03/19 12:50	DC	SW846 3060A/7196A

RL = Reporting Limit

Report of Analysis

Client Sample ID: FB(20181228)
Lab Sample ID: JC80585-1A
Matrix: AQ - Field Blank Soil
Project: PPG Site 107, 18 Chapel Avenue, Jersey City, NJ

Date Sampled: 12/28/18
Date Received: 12/28/18
Percent Solids: n/a

Total Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 6.0	6.0	ug/l	1	12/31/18	12/31/18	ND	SW846 6010D [1]	SW846 3010A [2]
Chromium	< 10	10	ug/l	1	12/31/18	12/31/18	ND	SW846 6010D [1]	SW846 3010A [2]
Nickel	< 10	10	ug/l	1	12/31/18	12/31/18	ND	SW846 6010D [1]	SW846 3010A [2]
Thallium	< 10	10	ug/l	1	12/31/18	12/31/18	ND	SW846 6010D [1]	SW846 3010A [2]
Vanadium	< 50	50	ug/l	1	12/31/18	12/31/18	ND	SW846 6010D [1]	SW846 3010A [2]

(1) Instrument QC Batch: MA45916
(2) Prep QC Batch: MP11790

RL = Reporting Limit

Report of Analysis

Client Sample ID:	FB(20181228)		
Lab Sample ID:	JC80585-1A	**Date Sampled:**	12/28/18
Matrix:	AQ - Field Blank Soil	**Date Received:**	12/28/18
		Percent Solids:	n/a
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	< 0.020	0.020	mg/l	1	12/31/18 17:48	ND	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID: BS-114
Lab Sample ID: JC80585-2A
Matrix: SO - Soil
Project: PPG Site 107, 18 Chapel Avenue, Jersey City, NJ

Date Sampled: 12/28/18
Date Received: 12/28/18
Percent Solids: 66.2

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 3.0	3.0	mg/kg	1	12/31/18	12/31/18	ND	SW846 6010D [1]	SW846 3050B [2]
Chromium	12.3	1.5	mg/kg	1	12/31/18	12/31/18	ND	SW846 6010D [1]	SW846 3050B [2]
Nickel	22.2	5.9	mg/kg	1	12/31/18	12/31/18	ND	SW846 6010D [1]	SW846 3050B [2]
Thallium	< 1.5	1.5	mg/kg	1	12/31/18	12/31/18	ND	SW846 6010D [1]	SW846 3050B [2]
Vanadium	16.1	7.4	mg/kg	1	12/31/18	12/31/18	ND	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA45917
(2) Prep QC Batch: MP11789

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-114		
Lab Sample ID:	JC80585-2A	**Date Sampled:**	12/28/18
Matrix:	SO - Soil	**Date Received:**	12/28/18
		Percent Solids:	66.2
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	~~11.3~~ 12.3	2.1	mg/kg	1	12/31/18 14:55	DC	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

SO
FB

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Page 1 OF 1

FED-EX Tracking #:
SGS Quote #:
Bottle Order Control #: AR-121014-197
SGS Job #: JC 81057

Client / Reporting Information	Project Information	Requested Analysis
Company Name: Arcadis	Project Name: PPG Site 107 (Jersey City)	
Street Address: 10 Friends Lane, Suite 200	Street: 18 Chapel Avenue	Billing Information (if different from Report to)
City: Newtown, PA State: Zip: 18440	City: Jersey City State: NJ	Company Name:
Project Contact: Matthew Bell E-mail:	Project #: NP000770.0001	Street Address:
Phone #: 610.755.7080	Client Purchase Order #:	City State Zip
Sampler(s) Name(s): C Buchanan Phone #:	Project Manager: Jim Mclaughlin, Jr.	Attention:

Matrix Codes: DW - Drinking Water; GW - Ground Water; WW - Water; SW - Surface Water; SO - Soil; SL - Sludge; SED-Sediment; OI - Oil; LIQ - Other Liquid; AIR - Air; SOL - Other Solid; WP - Wipe; FB - Field Blank; EB-Equipment Blank; RB - Rinse Blank; TB - Trip Blank

SGS Vendor #	Field ID / Point of Collection	MEOH/DI Vial #	Collection Date	Collection Time	Sampled by	Grab (G) / Comp (C)	Matrix	# of bottles	Number of preserved Bottles: HCl	NaOH	H_2SO_4	HNO3	DI Water	MEOH	ENCORE	Total Chromium	Hexavalent Chromium	Trivalent Chromium	Antimony	Nickel	Thallium	Vanadium				LAB USE ONLY
1	FB(20190109)		1/9/18	1300	CC	G	FB	4			2		2			X	X	X	X	X	X	X				
2	SW-A0 (0.0-0.5)		1/9/18	0945	CC	G	SO	1					1			X	X	X	X	X	X	X				
3	SW-A0 (2.0-2.5)		1/9/18	0950	CC	G	SO	1					1			X	X	X	X	X	X	X				A36
4	SW-A0(4.0-4.5)		1/9/18	0955	CC	G	SO	1					1			X	X	X	X	X	X	X				M19
5	SW-A0 (6.0-6.5)		1/9/18	1000	CC	G	SO	1					1			X	X	X	X	X	X	X				
6	SW-A0 (8.0-8.5)		1/9/18	1005	CC	G	SO	1					1			X	X	X	X	X	X	X				C37

Turn Around Time (Business Days)

Approved By (SGS PM): / Date:

- [ ] 10 Business Days
- [ ] 5 Business Days
- [ ] 3 Business Days*
- [X] 2 Business Days*
- [ ] 1 Business Day*
- [ ] Other

All data available via Lablink

*Approval needed for 1-3 Business Day TAT

Deliverable

- [ ] Commercial "A" (Level 1)
- [ ] Commercial "B" (Level 2)
- [ ] NJ Reduced (Level 3)
- [ ] Full Tier I (Level 4)
- [ ] Commercial "C"
- [ ] NJ DKQP
- [ ] NYASP Category A
- [ ] NYASP Category B
- [ ] MAMCP Criteria
- [ ] CTRCP Criteria
- [ ] State Forms
- [X] EDD Format _Equis_
- [ ] DOD-QSM5

Commercial "A" = Results only; Commercial "B" = Results + QC Summary
Commercial "C" = Results + QC Summary + Partial Raw data

Comments / Special Instructions

http://www.sgs.com/en/terms-and-conditions

Sample Custody must be documented below each time samples change possession, including courier delivery.

	Relinquished by:	Date / Time:	Received By:	Relinquished By:	Date / Time:	Received By:
1		01/09/19/1316	Robert Schaubers	2 Robert Schaubers	1/9/19 1628	2
3			3	4		4
5			5	Cooler Temp: 1.9	Intact / Not Intact	Preserved where applicable / Absent / Therm. ID	On Ice: 3.1

INITIAL ASESSMENT JR 20

LABEL VERIFICATION

SGS Post Ex Sample COCs 20190109

JC81057: Chain of Custody
Page 1 of 5

Report of Analysis

Client Sample ID:	FB(20190109)		
Lab Sample ID:	JC81057-1	**Date Sampled:**	01/09/18
Matrix:	AQ - Field Blank Soil	**Date Received:**	01/09/19
		Percent Solids:	n/a
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent [a]	< 0.010	0.010	mg/l	1	01/09/19 23:05	LS	SW846 7196A
Redox Potential Vs H2 [a]	491		mv	1	01/10/19 12:02	RI	ASTM D1498-76
pH [b]	6.15		su	1	01/09/19 16:42	FR	SM4500H+ B-11

(a) Sample received outside the holding time.
(b) Sample received out of holding time for pH analysis.

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A0(0.0-0.5)		
Lab Sample ID:	JC81057-2	**Date Sampled:**	01/09/18
Matrix:	SO - Soil	**Date Received:**	01/09/19
		Percent Solids:	85.2
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent [a]	1.4 J-	0.47	mg/kg	1	01/10/19 16:32	DC	SW846 3060A/7196A
Redox Potential Vs H2 [a]	304		mv	1	01/10/19 14:23	RI	ASTM D1498-76M
Solids, Percent	85.2		%	1	01/09/19 09:19	EB	SM2540 G 18TH ED MOD
pH	7.67		su	1	01/10/19 13:13	RI	SW846 9045D

(a) Sample received outside the holding time.

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A0(2.0-2.5)		
Lab Sample ID:	JC81057-3	**Date Sampled:**	01/09/18
Matrix:	SO - Soil	**Date Received:**	01/09/19
		Percent Solids:	82.2
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent [a]	1.4 J-	0.49	mg/kg	1	01/10/19 16:25	DC	SW846 3060A/7196A
Redox Potential Vs H2 [a]	403		mv	1	01/10/19 14:36	RI	ASTM D1498-76M
Solids, Percent	82.2		%	1	01/09/19 09:19	EB	SM2540 G 18TH ED MOD
pH	7.78		su	1	01/10/19 13:21	RI	SW846 9045D

(a) Sample received outside the holding time.

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A0(4.0-4.5)		
Lab Sample ID:	JC81057-4	**Date Sampled:**	01/09/18
Matrix:	SO - Soil	**Date Received:**	01/09/19
		Percent Solids:	82.3
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent [a]	3.0 J-	0.49	mg/kg	1	01/10/19 16:32	DC	SW846 3060A/7196A
Redox Potential Vs H2 [a]	341		mv	1	01/10/19 14:53	RI	ASTM D1498-76M
Solids, Percent	82.3		%	1	01/09/19 09:19	EB	SM2540 G 18TH ED MOD
pH	8.01		su	1	01/10/19 14:23	RI	SW846 9045D

(a) Sample received outside the holding time.

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A0(6.0-6.5)		
Lab Sample ID:	JC81057-5	**Date Sampled:**	01/09/18
Matrix:	SO - Soil	**Date Received:**	01/09/19
		Percent Solids:	85.4
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent [a]	3.2 J-	0.47	mg/kg	1	01/10/19 16:32	DC	SW846 3060A/7196A
Redox Potential Vs H2 [a]	299		mv	1	01/10/19 15:28	RI	ASTM D1498-76M
Solids, Percent	85.4		%	1	01/09/19 09:19	EB	SM2540 G 18TH ED MOD
pH	8.08		su	1	01/10/19 14:29	RI	SW846 9045D

(a) Sample received outside the holding time.

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A0(6.5-7.0)		
Lab Sample ID:	JC81057-6	**Date Sampled:**	01/09/18
Matrix:	SO - Soil	**Date Received:**	01/09/19
		Percent Solids:	72.1
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent [a]	1.6 J-	0.55	mg/kg	1	01/10/19 16:32	DC	SW846 3060A/7196A
Redox Potential Vs H2 [a]	374		mv	1	01/10/19 15:40	RI	ASTM D1498-76M
Solids, Percent	72.1		%	1	01/09/19 09:19	EB	SM2540 G 18TH ED MOD
pH	7.76		su	1	01/10/19 14:36	RI	SW846 9045D

(a) Sample received outside the holding time.

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A0(0.0-0.5)		
Lab Sample ID:	JC81057-2R	**Date Sampled:**	01/09/18
Matrix:	SO - Soil	**Date Received:**	01/09/19
		Percent Solids:	85.2
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent [a]	0.59	0.47	mg/kg	1	01/14/19 15:22	DC	SW846 3060A/7196A

(a) Sample received outside the holding time.

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A0(2.0-2.5)		
Lab Sample ID:	JC81057-3R	**Date Sampled:**	01/09/18
Matrix:	SO - Soil	**Date Received:**	01/09/19
		Percent Solids:	82.2
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent [a]	1.3	0.49	mg/kg	1	01/14/19 15:15	DC	SW846 3060A/7196A

(a) Sample received outside the holding time.

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A0(2.0-2.5)		
Lab Sample ID:	JC81057-3RT	**Date Sampled:**	01/09/18
Matrix:	SO - Soil	**Date Received:**	01/09/19
		Percent Solids:	82.2
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Iron, Ferrous [a]	0.54 J	0.20	%	1	01/17/19 12:10	ST	ASTM D3872-86
Sulfide Screen [a]	NEGATIVE UJ			1	01/17/19 12:10	ST	SM4500S2- A-11
Total Organic Carbon [a]	31200	120	mg/kg	1	01/16/19 18:48	JO	LLOYD KAHN 1988 MOD

(a) Sample received outside the holding time.

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A0(4.0-4.5)		
Lab Sample ID:	JC81057-4R	**Date Sampled:**	01/09/18
Matrix:	SO - Soil	**Date Received:**	01/09/19
		Percent Solids:	82.3
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent [a]	0.73	0.49	mg/kg	1	01/14/19 15:22	DC	SW846 3060A/7196A

(a) Sample received outside the holding time.

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A0(6.0-6.5)		
Lab Sample ID:	JC81057-5R	**Date Sampled:**	01/09/18
Matrix:	SO - Soil	**Date Received:**	01/09/19
		Percent Solids:	85.4
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent [a]	1.9	0.47	mg/kg	1	01/14/19 15:22	DC	SW846 3060A/7196A

(a) Sample received outside the holding time.

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A0(6.5-7.0)		
Lab Sample ID:	JC81057-6R	**Date Sampled:**	01/09/18
Matrix:	SO - Soil	**Date Received:**	01/09/19
		Percent Solids:	72.1
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent [a]	3.6	0.55	mg/kg	1	01/14/19 15:22	DC	SW846 3060A/7196A

(a) Sample received outside the holding time.

RL = Reporting Limit

Report of Analysis

Client Sample ID: FB(20190109)
Lab Sample ID: JC81057-1A
Matrix: AQ - Field Blank Soil
Project: PPG Site 107, 18 Chapel Avenue, Jersey City, NJ

Date Sampled: 01/09/18
Date Received: 01/09/19
Percent Solids: n/a

Total Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 6.0	6.0	ug/l	1	01/10/19	01/10/19	ND	SW846 6010D [1]	SW846 3010A [2]
Chromium	< 10	10	ug/l	1	01/10/19	01/10/19	ND	SW846 6010D [1]	SW846 3010A [2]
Nickel	< 10	10	ug/l	1	01/10/19	01/10/19	ND	SW846 6010D [1]	SW846 3010A [2]
Thallium	< 10	10	ug/l	1	01/10/19	01/10/19	ND	SW846 6010D [1]	SW846 3010A [2]
Vanadium	< 50	50	ug/l	1	01/10/19	01/10/19	ND	SW846 6010D [1]	SW846 3010A [2]

(1) Instrument QC Batch: MA45961
(2) Prep QC Batch: MP12023

RL = Reporting Limit

Report of Analysis

Client Sample ID:	FB(20190109)		
Lab Sample ID:	JC81057-1A	**Date Sampled:**	01/09/18
Matrix:	AQ - Field Blank Soil	**Date Received:**	01/09/19
		Percent Solids:	n/a
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	< 0.020	0.020	mg/l	1	01/10/19 23:43	ND	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A0(0.0-0.5)		
Lab Sample ID:	JC81057-2A	**Date Sampled:**	01/09/18
Matrix:	SO - Soil	**Date Received:**	01/09/19
		Percent Solids:	85.2
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 2.2	2.2	mg/kg	1	01/09/19	01/10/19	ND	SW846 6010D [1]	SW846 3050B [2]
Chromium	16.3	1.1	mg/kg	1	01/09/19	01/10/19	ND	SW846 6010D [1]	SW846 3050B [2]
Nickel	13.3	4.5	mg/kg	1	01/09/19	01/10/19	ND	SW846 6010D [1]	SW846 3050B [2]
Thallium	< 1.1	1.1	mg/kg	1	01/09/19	01/10/19	ND	SW846 6010D [1]	SW846 3050B [2]
Vanadium	20.0	5.6	mg/kg	1	01/09/19	01/10/19	ND	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA45958
(2) Prep QC Batch: MP12019

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A0(0.0-0.5)		
Lab Sample ID:	JC81057-2A	**Date Sampled:**	01/09/18
Matrix:	SO - Soil	**Date Received:**	01/09/19
		Percent Solids:	85.2
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	14.9	1.6	mg/kg	1	01/10/19 16:32	DC	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID: SW-A0(2.0-2.5)
Lab Sample ID: JC81057-3A
Matrix: SO - Soil
Project: PPG Site 107, 18 Chapel Avenue, Jersey City, NJ

Date Sampled: 01/09/18
Date Received: 01/09/19
Percent Solids: 82.2

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 2.3	2.3	mg/kg	1	01/09/19	01/10/19	ND	SW846 6010D [1]	SW846 3050B [2]
Chromium	39.5	1.2	mg/kg	1	01/09/19	01/10/19	ND	SW846 6010D [1]	SW846 3050B [2]
Nickel	24.8	4.7	mg/kg	1	01/09/19	01/10/19	ND	SW846 6010D [1]	SW846 3050B [2]
Thallium	< 1.2	1.2	mg/kg	1	01/09/19	01/10/19	ND	SW846 6010D [1]	SW846 3050B [2]
Vanadium	36.9	5.8	mg/kg	1	01/09/19	01/10/19	ND	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA45958
(2) Prep QC Batch: MP12019

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A0(2.0-2.5)		
Lab Sample ID:	JC81057-3A	**Date Sampled:**	01/09/18
Matrix:	SO - Soil	**Date Received:**	01/09/19
		Percent Solids:	82.2
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	38.1	1.7	mg/kg	1	01/10/19 16:25	DC	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A0(4.0-4.5)		
Lab Sample ID:	JC81057-4A	**Date Sampled:**	01/09/18
Matrix:	SO - Soil	**Date Received:**	01/09/19
		Percent Solids:	82.3
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 2.4	2.4	mg/kg	1	01/09/19	01/10/19	ND	SW846 6010D [1]	SW846 3050B [2]
Chromium	25.2	1.2	mg/kg	1	01/09/19	01/10/19	ND	SW846 6010D [1]	SW846 3050B [2]
Nickel	28.3	4.8	mg/kg	1	01/09/19	01/10/19	ND	SW846 6010D [1]	SW846 3050B [2]
Thallium	< 1.2	1.2	mg/kg	1	01/09/19	01/10/19	ND	SW846 6010D [1]	SW846 3050B [2]
Vanadium	43.6	6.0	mg/kg	1	01/09/19	01/10/19	ND	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA45958
(2) Prep QC Batch: MP12019

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A0(4.0-4.5)		
Lab Sample ID:	JC81057-4A	**Date Sampled:**	01/09/18
Matrix:	SO - Soil	**Date Received:**	01/09/19
		Percent Solids:	82.3
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	22.2	1.7	mg/kg	1	01/10/19 16:32	DC	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A0(6.0-6.5)		
Lab Sample ID:	JC81057-5A	**Date Sampled:**	01/09/18
Matrix:	SO - Soil	**Date Received:**	01/09/19
		Percent Solids:	85.4
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 2.4	2.4	mg/kg	1	01/09/19	01/10/19	ND	SW846 6010D [1]	SW846 3050B [2]
Chromium	30.9	1.2	mg/kg	1	01/09/19	01/10/19	ND	SW846 6010D [1]	SW846 3050B [2]
Nickel	24.2	4.8	mg/kg	1	01/09/19	01/10/19	ND	SW846 6010D [1]	SW846 3050B [2]
Thallium	< 1.2	1.2	mg/kg	1	01/09/19	01/10/19	ND	SW846 6010D [1]	SW846 3050B [2]
Vanadium	39.3	6.0	mg/kg	1	01/09/19	01/10/19	ND	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA45958
(2) Prep QC Batch: MP12019

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A0(6.0-6.5)		
Lab Sample ID:	JC81057-5A	**Date Sampled:**	01/09/18
Matrix:	SO - Soil	**Date Received:**	01/09/19
		Percent Solids:	85.4
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	27.7	1.7	mg/kg	1	01/10/19 16:32	DC	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID: SW-A0(6.5-7.0)
Lab Sample ID: JC81057-6A
Matrix: SO - Soil
Project: PPG Site 107, 18 Chapel Avenue, Jersey City, NJ

Date Sampled: 01/09/18
Date Received: 01/09/19
Percent Solids: 72.1

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 2.6	2.6	mg/kg	1	01/09/19	01/10/19	ND	SW846 6010D [1]	SW846 3050B [2]
Chromium	51.5	1.3	mg/kg	1	01/09/19	01/10/19	ND	SW846 6010D [1]	SW846 3050B [2]
Nickel	19.5	5.3	mg/kg	1	01/09/19	01/10/19	ND	SW846 6010D [1]	SW846 3050B [2]
Thallium	< 1.3	1.3	mg/kg	1	01/09/19	01/10/19	ND	SW846 6010D [1]	SW846 3050B [2]
Vanadium	41.3	6.6	mg/kg	1	01/09/19	01/10/19	ND	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA45958
(2) Prep QC Batch: MP12019

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A0(6.5-7.0)		
Lab Sample ID:	JC81057-6A	**Date Sampled:**	01/09/18
Matrix:	SO - Soil	**Date Received:**	01/09/19
		Percent Solids:	72.1
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	49.9	1.9	mg/kg	1	01/10/19 16:32	DC	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

SO
FB

CHAIN OF CUSTODY

SGS North America Inc. - Dayton
2235 Route 130, Dayton, NJ 08810
TEL. 732-329-0200 FAX 732-329-3499
www.sgs.com/ehsusa

PAGE 1 OF 1

FED-EX Tracking #:
Bottle Order Control #: AR-121018-187
SGS Quote #:
SGS Job #: JC81058

Client / Reporting Information

Company Name: Arcadis
Street Address: 10 Friends Lane
City: Newtown State: PA Zip: 18440
Project Contact: Matt Bell E-mail:
Phone #: 646.762.5629 Fax #:
Sampler(s) Name(s): Christa Cifelli Phone #: 201.264.8405

Project Information

Project Name: PPG Jersey City Site 107
Street: 18 Chapel Avenue
City: Jersey City State: NJ
Project #: NP000770.0001.00008
Client Purchase Order #:
Project Manager: Jim McLaughlin

Billing Information (If different from Report to)

Company Name:
Street Address:
City: State: Zip:
Attention:

Requested Analysis (see TEST CODE sheet)

Matrix Codes: ~~DW~~ - Drinking Water; GW - Ground Water; WW - Water; SW - Surface Water; SO - Soil; SL - Sludge; SED-Sediment; OI - Oil; LIQ - Other Liquid; AIR - Air; SOL - Other Solid; WP - Wipe; FB-Field Blank; EB-Equipment Blank; RB- Rinse Blank; TB-Trip Blank

Lab Sample #	Field ID / Point of Collection	MEOH/DI Vial #	Collection Date	Collection Time	Sampled by	Matrix	# of bottles	Number of preserved bottles: HCl	NaOH	HNO3	H2SO4	NONE	DI Water	MEOH	ENCORE	Total Chromium	Hexavalent Chromium	Trivalent Chromium	Vanadium	Thallium	Antimony	Nickel	LAB USE ONLY
1	FB(20190108)		1/8/19	1200	CC	FB	4			2		2				X	X	X	X	X	X	X	A36
2	BS-A5		1/8/19	1245	CC	SO	1					1				X	X	X	X	X	X	X	M19
3	107-M020N		1/8/19	1300	CC	SO	1					1				X	X	X	X	X	X	X	
																							C37

Turnaround Time (Business days)

- [ ] Std. 10 Business Days
- [ ] 5 Day RUSH
- [ ] 3 Day RUSH
- [x] 2 Day RUSH
- [ ] 1 Day RUSH
- [ ] other

Approved by (SGS Project Manager)/Date:

Emergency & Rush T/A data available via LabLink

Data Deliverable Information

- [ ] Commercial "A" (Level 1)
- [ ] Commercial "B" (Level 2)
- [ ] FULLT1 (Level 3+4)
- [ ] NJ Reduced
- [ ] Commercial "C"
- [ ] NJ Data of Known Quality Protocol Reporting
- [ ] NYASP Category A
- [ ] NYASP Category B
- [ ] State Forms
- [x] EDD Format Equis
- [ ] Other

Commercial "A" = Results Only; Commercial "B" = Results + QC Summary
NJ Reduced = Results + QC Summary + Partial Raw data

Comments / Special Instructions

INITIAL ASESSMENT LAC 2B
LABEL VERIFICATION
Sample inventory is verified upon receipt in the Laboratory

Sample Custody must be documented below each time samples change possession, including courier delivery.

	Relinquished by Sampler:	Date Time:	Received By:	Relinquished By:	Date Time:	Received By:
1		1/9/19 1011	Robert Schreibers	Robert Schreibers	1-9-19 1629	
2	Relinquished by Sampler:	Date Time:	Received By:	Relinquished By:	Date Time:	Received By:
	3		3	4		4
3	Relinquished by:	Date Time:	Received By:	Custody Seal # 19258	Preserved where applicable	On Ice / Cooler Temp
	5		5	☐ Intact ☐ Not intact	☐	X / 3.3°C

Form:SM088-03C (revised 2/12/18)

http://www.sgs.com/en/terms-and-conditions.

5.2 5

Report of Analysis

Client Sample ID:	FB(20190108)		
Lab Sample ID:	JC81058-1	**Date Sampled:**	01/08/19
Matrix:	AQ - Field Blank Soil	**Date Received:**	01/09/19
		Percent Solids:	n/a
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent [a]	< 0.010 UJ	0.010	mg/l	1	01/09/19 23:05	LS	SW846 7196A
Redox Potential Vs H2	472		mv	1	01/10/19 12:05	RI	ASTM D1498-76
pH [b]	5.99		su	1	01/09/19 16:50	FR	SM4500H+ B-11

(a) Analysis done out of holding time.
(b) Sample received out of holding time for pH analysis.

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-A5		
Lab Sample ID:	JC81058-2	**Date Sampled:**	01/08/19
Matrix:	SO - Soil	**Date Received:**	01/09/19
		Percent Solids:	88.3
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	16.5	0.45	mg/kg	1	01/11/19 12:55	DC	SW846 3060A/7196A
Redox Potential Vs H2	141		mv	1	01/10/19 15:51	RI	ASTM D1498-76M
Solids, Percent	88.3		%	1	01/09/19 09:19	EB	SM2540 G 18TH ED MOD
pH	10.25 J		su	1	01/10/19 15:40	RI	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID:	107_M020N		
Lab Sample ID:	JC81058-3	**Date Sampled:**	01/08/19
Matrix:	SO - Soil	**Date Received:**	01/09/19
		Percent Solids:	88.0
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	41.5	0.45	mg/kg	1	01/11/19 12:50	DC	SW846 3060A/7196A
Redox Potential Vs H2	212		mv	1	01/10/19 15:59	RI	ASTM D1498-76M
Solids, Percent	88		%	1	01/09/19 09:19	EB	SM2540 G 18TH ED MOD
pH	8.56 J		su	1	01/10/19 15:44	RI	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID: FB(20190108)
Lab Sample ID: JC81058-1A
Matrix: AQ - Field Blank Soil
Project: PPG Site 107, 18 Chapel Avenue, Jersey City, NJ

Date Sampled: 01/08/19
Date Received: 01/09/19
Percent Solids: n/a

Total Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 6.0	6.0	ug/l	1	01/10/19	01/10/19	ND	SW846 6010D [1]	SW846 3010A [2]
Chromium	< 10	10	ug/l	1	01/10/19	01/10/19	ND	SW846 6010D [1]	SW846 3010A [2]
Nickel	< 10	10	ug/l	1	01/10/19	01/10/19	ND	SW846 6010D [1]	SW846 3010A [2]
Thallium	< 10	10	ug/l	1	01/10/19	01/10/19	ND	SW846 6010D [1]	SW846 3010A [2]
Vanadium	< 50	50	ug/l	1	01/10/19	01/10/19	ND	SW846 6010D [1]	SW846 3010A [2]

(1) Instrument QC Batch: MA45961
(2) Prep QC Batch: MP12023

RL = Reporting Limit

Report of Analysis

Client Sample ID:	FB(20190108)		
Lab Sample ID:	JC81058-1A	**Date Sampled:**	01/08/19
Matrix:	AQ - Field Blank Soil	**Date Received:**	01/09/19
		Percent Solids:	n/a
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	< 0.020	0.020	mg/l	1	01/10/19 23:49	ND	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-A5		
Lab Sample ID:	JC81058-2A	**Date Sampled:**	01/08/19
Matrix:	SO - Soil	**Date Received:**	01/09/19
		Percent Solids:	88.3
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 2.4	2.4	mg/kg	1	01/09/19	01/10/19	ND	SW846 6010D [1]	SW846 3050B [2]
Chromium	102	1.2	mg/kg	1	01/09/19	01/10/19	ND	SW846 6010D [1]	SW846 3050B [2]
Nickel	12.1	4.7	mg/kg	1	01/09/19	01/10/19	ND	SW846 6010D [1]	SW846 3050B [2]
Thallium	< 1.2	1.2	mg/kg	1	01/09/19	01/10/19	ND	SW846 6010D [1]	SW846 3050B [2]
Vanadium	20.7	5.9	mg/kg	1	01/09/19	01/10/19	ND	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA45958
(2) Prep QC Batch: MP12019

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-A5		
Lab Sample ID:	JC81058-2A	**Date Sampled:**	01/08/19
Matrix:	SO - Soil	**Date Received:**	01/09/19
		Percent Solids:	88.3
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	85.5	1.7	mg/kg	1	01/11/19 12:55	DC	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID: 107_M020N
Lab Sample ID: JC81058-3A
Matrix: SO - Soil
Project: PPG Site 107, 18 Chapel Avenue, Jersey City, NJ

Date Sampled: 01/08/19
Date Received: 01/09/19
Percent Solids: 88.0

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 2.2	2.2	mg/kg	1	01/09/19	01/10/19	ND	SW846 6010D [1]	SW846 3050B [2]
Chromium	199	1.1	mg/kg	1	01/09/19	01/10/19	ND	SW846 6010D [1]	SW846 3050B [2]
Nickel	20.6	4.4	mg/kg	1	01/09/19	01/10/19	ND	SW846 6010D [1]	SW846 3050B [2]
Thallium	< 1.1	1.1	mg/kg	1	01/09/19	01/10/19	ND	SW846 6010D [1]	SW846 3050B [2]
Vanadium	22.7	5.5	mg/kg	1	01/09/19	01/10/19	ND	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA45958
(2) Prep QC Batch: MP12019

RL = Reporting Limit

Report of Analysis

Client Sample ID:	107_M020N		
Lab Sample ID:	JC81058-3A	**Date Sampled:**	01/08/19
Matrix:	SO - Soil	**Date Received:**	01/09/19
		Percent Solids:	88.0
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	158	1.6	mg/kg	1	01/11/19 12:50	DC	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

SGS

CHAIN OF CUSTODY

SGS North America Inc. - Dayton
2235 Route 130, Dayton, NJ 08810
TEL. 732-329-0200 FAX: 732-329-3499/3480
www.sgs.com/ehsusa

Page 1 OF 1

FED-EX Tracking #: | Bottle Order Control #: | SGS Quote #: | SGS Job #: JC81147

Client / Reporting Information
Company Name: Arcadis
Street Address: 10 Friends Lane, Suite 200
City: Newtown, PA Zip: 18440
Project Contact: Matthew Bell E-mail:
Phone #: 610.755.7080
Sampler(s) Name(s): C Buchanan Phone #:

Project Information
Project Name: PPG Site 107 (Jersey City)
Street: 18 Chapel Avenue
City: Jersey City State: NJ
Project #: NP000770.0001
Client Purchase Order #:
Project Manager: Jim Mclaughlin, Jr.

Billing Information (If different from Report to)
Company Name:
Street Address:
City: State: Zip:
Attention:

Matrix Codes: DW - Drinking Water, GW - Ground Water, WW - Water, SW - Surface Water, SO - Soil, SL - Sludge, SED - Sediment, OI - Oil, LIQ - Other Liquid, AIR - Air, SOL - Other Solid, WP - Wipe, FB - Field Blank, EB - Equipment Blank, RB - Rinse Blank, TB - Trip Blank

SGS Sample #	Field ID / Point of Collection	MEOH/DI Vial #	Date	Time	Sampled by	Grab (G) Comp (C)	Matrix	# of bottles	HCl	NaOH	HNO3	H2SO4	NONE	DI Water	MEOH	ENCORE	Total Chromium	Hexavalent Chromium	Trivalent Chromium	Antimony	Nickel	Thallium	Vanadium	LAB USE ONLY
1	FB(20190110)		1/10/19	1030	CC	G	FB	2			1		1				X	X	X	X	X	X	X	
2	BS-A8		1/1019	13:10	CC	G	SO	1					1				X	X	X	X	X	X	X	C15
3	BS-A9		1/1019	1305	CC	G	SO	1					1				X	X	X	X	X	X	X	
4	BS-A9U		1/1019	1310	CC	G	SO	1					1				X	X	X	X	X	X	X	A23
5	DUP(20190110)RR		–	–	CC	G	SO	1					1				X	X	X	X	X	X	X	M16
3	BS-A9 MS		1/1019	1305	CC	G	SO	1					1				X	X	X	X	X	X	X	
	BS-A9 MSD		1/1019	1305	CC	G	SO	1					1				X	X	X	X	X	X	X	

Turn Around Time (Business Days)
Approved By (SGS PM): / Date:
- [ ] 10 Business Days
- [ ] 5 Business Days
- [ ] 3 Business Days*
- [x] 2 Business Days*
- [ ] 1 Business Day*
- [ ] Other

All data available via Lablink
* Approval needed for 1-3 Business Day TAT

Deliverable
- [ ] Commercial "A" (Level 1)
- [ ] Commercial "B" (Level 2)
- [ ] NJ Reduced (Level 3)
- [ ] Full Tier I (Level 4)
- [ ] Commercial "C"
- [ ] NJ DKQP
- [ ] NYASP Category A
- [ ] NYASP Category B
- [ ] MA MCP Criteria_____
- [ ] CT RCP Criteria_____
- [ ] State Forms
- [x] EDD Format _Equis__
- [ ] DOD-QSM5

Commercial "A" = Results only; Commercial "B" = Results + QC Summary
Commercial "C" = Results + QC Summary + Partial Raw data

Comments / Special Instructions
Initial Assessment 3B (A)
Label Verification________
http://www.sgs.com/en/terms-and-conditions

Sample Custody must be documented below each time samples change possession, including courier delivery.

Relinquished by:	Date / Time:	Received By:	Relinquished By:	Date / Time:	Received By:
1 [signature]	1/10/18 1400	1 [signature]	2 [signature]	1-10-19 1700	2 [signature]
3		3	4		4
5		5	Custody Seal # 27734	☐ Intact ☐ Not intact	Preserved where applicable ☐ Absent; Therm. ID; On Ice X; Cooler Temp. °C 0.2; 1.9

Copy of SGS Post Ex Sample COCs 20190110

JC81147: Chain of Custody
Page 1 of 5

Report of Analysis

Client Sample ID:	FB(20190110)-A1		
Lab Sample ID:	JC81147-1	**Date Sampled:**	01/10/19
Matrix:	AQ - Field Blank Soil	**Date Received:**	01/10/19
		Percent Solids:	n/a
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	< 0.010	0.010	mg/l	1	01/10/19 21:00	JOO	SW846 7196A
Redox Potential Vs H2	408		mv	1	01/11/19 18:15	JO	ASTM D1498-76
pH [a]	5.47		su	1	01/10/19 17:20	JP	SM4500H+ B-11

(a) Sample received out of holding time for pH analysis.

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-A8		
Lab Sample ID:	JC81147-2	**Date Sampled:**	01/10/19
Matrix:	SO - Soil	**Date Received:**	01/10/19
		Percent Solids:	83.6
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	1.6 J	0.48	mg/kg	1	01/11/19 16:44	DC	SW846 3060A/7196A
Redox Potential Vs H2	333		mv	1	01/11/19 23:16	JO	ASTM D1498-76M
Solids, Percent	83.6		%	1	01/11/19 17:00	RC	SM2540 G 18TH ED MOD
pH	6.03		su	1	01/11/19 23:16	JO	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-A9		
Lab Sample ID:	JC81147-3	**Date Sampled:**	01/10/19
Matrix:	SO - Soil	**Date Received:**	01/10/19
		Percent Solids:	78.3
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	1.3 J-	0.51	mg/kg	1	01/11/19 16:41	DC	SW846 3060A/7196A
Redox Potential Vs H2	352		mv	1	01/11/19 23:23	JO	ASTM D1498-76M
Solids, Percent	78.3		%	1	01/11/19 17:00	RC	SM2540 G 18TH ED MOD
pH	5.42		su	1	01/11/19 23:23	JO	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-A9U		
Lab Sample ID:	JC81147-4	**Date Sampled:**	01/10/19
Matrix:	SO - Soil	**Date Received:**	01/10/19
		Percent Solids:	81.0
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	2.1 J-	0.49	mg/kg	1	01/11/19 16:44	DC	SW846 3060A/7196A
Redox Potential Vs H2	303		mv	1	01/11/19 23:34	JO	ASTM D1498-76M
Solids, Percent	81		%	1	01/11/19 17:00	RC	SM2540 G 18TH ED MOD
pH	7.10		su	1	01/11/19 23:34	JO	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID:	DUP-1RR(20190110)		
Lab Sample ID:	JC81147-5	**Date Sampled:**	01/10/19
Matrix:	SO - Soil	**Date Received:**	01/10/19
		Percent Solids:	83.7
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	3.2 J	0.48	mg/kg	1	01/11/19 16:44	DC	SW846 3060A/7196A
Redox Potential Vs H2	306		mv	1	01/11/19 23:44	JO	ASTM D1498-76M
Solids, Percent	83.7		%	1	01/11/19 17:00	RC	SM2540 G 18TH ED MOD
pH	6.04		su	1	01/11/19 23:44	JO	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-A8		
Lab Sample ID:	JC81147-2R	**Date Sampled:**	01/10/19
Matrix:	SO - Soil	**Date Received:**	01/10/19
		Percent Solids:	83.6
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	4.0	0.48	mg/kg	1	01/15/19 15:59	DC	SW846 3060A/7196A

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-A9		
Lab Sample ID:	JC81147-3R	**Date Sampled:**	01/10/19
Matrix:	SO - Soil	**Date Received:**	01/10/19
		Percent Solids:	78.3
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	< 0.51	0.51	mg/kg	1	01/15/19 15:55	DC	SW846 3060A/7196A

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-A9		
Lab Sample ID:	JC81147-3RT	**Date Sampled:**	01/10/19
Matrix:	SO - Soil	**Date Received:**	01/10/19
		Percent Solids:	78.3
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Iron, Ferrous	0.95 J	0.20	%	1	01/17/19 12:10	ST	ASTM D3872-86
Sulfide Screen	NEGATIVE			1	01/17/19 12:10	ST	SM4500S2- A-11
Total Organic Carbon	7970	130	mg/kg	1	01/16/19 19:11	JO	LLOYD KAHN 1988 MOD

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-A9U		
Lab Sample ID:	JC81147-4R	**Date Sampled:**	01/10/19
Matrix:	SO - Soil	**Date Received:**	01/10/19
		Percent Solids:	81.0
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	24.5	0.49	mg/kg	1	01/15/19 15:59	DC	SW846 3060A/7196A

RL = Reporting Limit

Report of Analysis

Client Sample ID:	DUP-1RR(20190110)		
Lab Sample ID:	JC81147-5R	**Date Sampled:**	01/10/19
Matrix:	SO - Soil	**Date Received:**	01/10/19
		Percent Solids:	83.7
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	8.1	0.48	mg/kg	1	01/15/19 15:59	DC	SW846 3060A/7196A

RL = Reporting Limit

Report of Analysis

Client Sample ID: FB(20190110)
Lab Sample ID: JC81147-1A
Matrix: AQ - Field Blank Soil
Project: PPG Site 107, 18 Chapel Avenue, Jersey City, NJ

Date Sampled: 01/10/19
Date Received: 01/10/19
Percent Solids: n/a

Total Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 6.0	6.0	ug/l	1	01/11/19	01/11/19	ND	SW846 6010D [1]	SW846 3010A [2]
Chromium	< 10	10	ug/l	1	01/11/19	01/11/19	ND	SW846 6010D [1]	SW846 3010A [2]
Nickel	< 10	10	ug/l	1	01/11/19	01/11/19	ND	SW846 6010D [1]	SW846 3010A [2]
Thallium	< 10	10	ug/l	1	01/11/19	01/11/19	ND	SW846 6010D [1]	SW846 3010A [2]
Vanadium	< 50	50	ug/l	1	01/11/19	01/11/19	ND	SW846 6010D [1]	SW846 3010A [2]

(1) Instrument QC Batch: MA45966
(2) Prep QC Batch: MP12045

RL = Reporting Limit

Report of Analysis

Client Sample ID:	FB(20190110)		
Lab Sample ID:	JC81147-1A	**Date Sampled:**	01/10/19
Matrix:	AQ - Field Blank Soil	**Date Received:**	01/10/19
		Percent Solids:	n/a
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	< 0.020	0.020	mg/l	1	01/11/19 16:41	ND	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-A8		
Lab Sample ID:	JC81147-2A	**Date Sampled:**	01/10/19
Matrix:	SO - Soil	**Date Received:**	01/10/19
		Percent Solids:	83.6
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 2.3 UJ-	2.3	mg/kg	1	01/10/19	01/11/19	ND	SW846 6010D [1]	SW846 3050B [2]
Chromium	76.1 J	1.1	mg/kg	1	01/10/19	01/11/19	ND	SW846 6010D [1]	SW846 3050B [2]
Nickel	8.5	4.6	mg/kg	1	01/10/19	01/11/19	ND	SW846 6010D [1]	SW846 3050B [2]
Thallium	< 1.1	1.1	mg/kg	1	01/10/19	01/11/19	ND	SW846 6010D [1]	SW846 3050B [2]
Vanadium	17.9	5.7	mg/kg	1	01/10/19	01/11/19	ND	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA45966
(2) Prep QC Batch: MP12042

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-A8		
Lab Sample ID:	JC81147-2A	**Date Sampled:**	01/10/19
Matrix:	SO - Soil	**Date Received:**	01/10/19
		Percent Solids:	83.6
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	74.5	1.6	mg/kg	1	01/11/19 16:44	DC	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-A9		
Lab Sample ID:	JC81147-3A	**Date Sampled:**	01/10/19
Matrix:	SO - Soil	**Date Received:**	01/10/19
		Percent Solids:	78.3
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 2.4 UJ-	2.4	mg/kg	1	01/10/19	01/11/19	ND	SW846 6010D [1]	SW846 3050B [2]
Chromium	15.0 J	1.2	mg/kg	1	01/10/19	01/11/19	ND	SW846 6010D [1]	SW846 3050B [2]
Nickel	11.9	4.9	mg/kg	1	01/10/19	01/11/19	ND	SW846 6010D [1]	SW846 3050B [2]
Thallium	< 1.2	1.2	mg/kg	1	01/10/19	01/11/19	ND	SW846 6010D [1]	SW846 3050B [2]
Vanadium	23.7	6.1	mg/kg	1	01/10/19	01/11/19	ND	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA45966
(2) Prep QC Batch: MP12042

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-A9		
Lab Sample ID:	JC81147-3A	**Date Sampled:**	01/10/19
Matrix:	SO - Soil	**Date Received:**	01/10/19
		Percent Solids:	78.3
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	13.7	1.7	mg/kg	1	01/11/19 16:41	DC	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-A9U		
Lab Sample ID:	JC81147-4A	**Date Sampled:**	01/10/19
Matrix:	SO - Soil	**Date Received:**	01/10/19
		Percent Solids:	81.0
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony [a]	< 4.7 UJ-	4.7	mg/kg	2	01/10/19	01/11/19	ND	SW846 6010D [1]	SW846 3050B [2]
Chromium [a]	1090 J	2.4	mg/kg	2	01/10/19	01/11/19	ND	SW846 6010D [1]	SW846 3050B [2]
Nickel	12.6	4.7	mg/kg	1	01/10/19	01/11/19	ND	SW846 6010D [1]	SW846 3050B [2]
Thallium [a]	< 2.4	2.4	mg/kg	2	01/10/19	01/11/19	ND	SW846 6010D [1]	SW846 3050B [2]
Vanadium [a]	25.5	12	mg/kg	2	01/10/19	01/11/19	ND	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA45966
(2) Prep QC Batch: MP12042

(a) Elevated detection limit due to dilution required for high interfering element.

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-A9U		
Lab Sample ID:	JC81147-4A	**Date Sampled:**	01/10/19
Matrix:	SO - Soil	**Date Received:**	01/10/19
		Percent Solids:	81.0
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	1090	2.9	mg/kg	1	01/11/19 16:44	DC	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	DUP(20190110)RR		
Lab Sample ID:	JC81147-5A	**Date Sampled:**	01/10/19
Matrix:	SO - Soil	**Date Received:**	01/10/19
		Percent Solids:	83.7
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 2.4 UJ-	2.4	mg/kg	1	01/10/19	01/11/19	ND	SW846 6010D [1]	SW846 3050B [2]
Chromium	55.3 J	1.2	mg/kg	1	01/10/19	01/11/19	ND	SW846 6010D [1]	SW846 3050B [2]
Nickel	8.5	4.7	mg/kg	1	01/10/19	01/11/19	ND	SW846 6010D [1]	SW846 3050B [2]
Thallium	< 1.2	1.2	mg/kg	1	01/10/19	01/11/19	ND	SW846 6010D [1]	SW846 3050B [2]
Vanadium	18.2	5.9	mg/kg	1	01/10/19	01/11/19	ND	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA45966
(2) Prep QC Batch: MP12042

RL = Reporting Limit

Report of Analysis

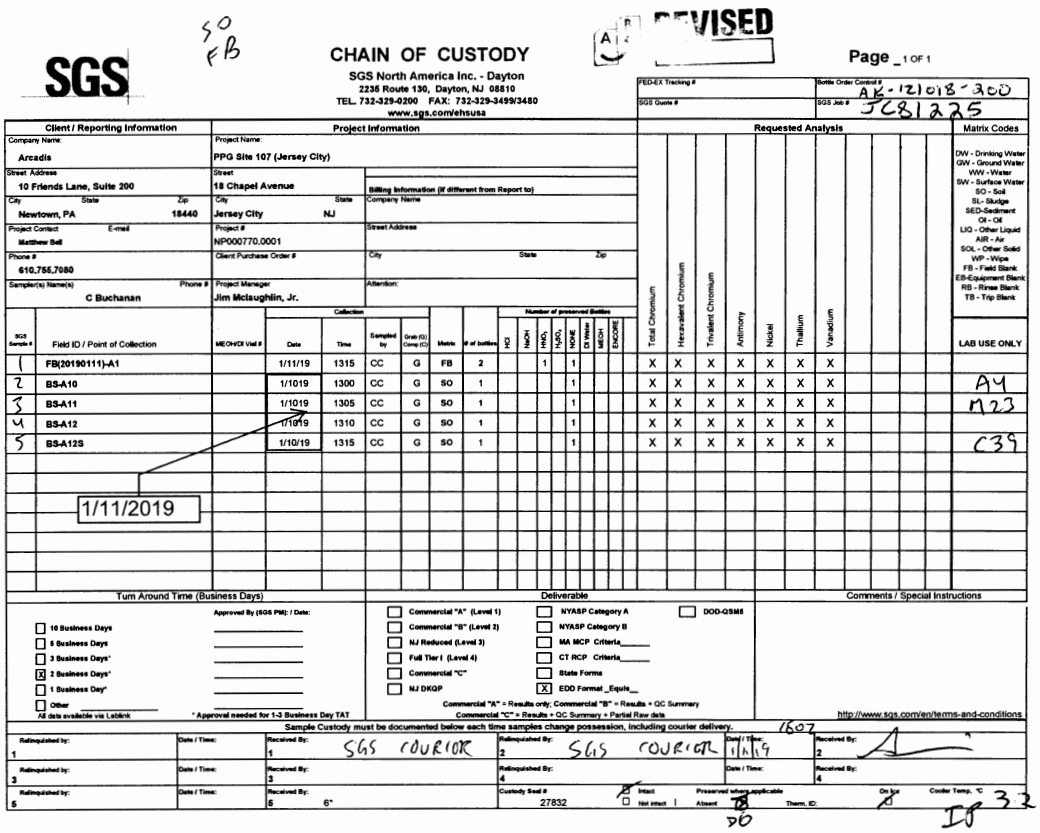
Client Sample ID:	DUP(20190110)RR		
Lab Sample ID:	JC81147-5A	**Date Sampled:**	01/10/19
Matrix:	SO - Soil	**Date Received:**	01/10/19
		Percent Solids:	83.7
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	52.1	1.7	mg/kg	1	01/11/19 16:44	DC	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit



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FB

CHAIN OF CUSTODY

SGS North America Inc. - Dayton
2235 Route 130, Dayton, NJ 08810
TEL. 732-329-0200 FAX: 732-329-3499/3480
www.sgs.com/ehsusa

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Page _1 OF 1

FED-EX Tracking #

Bottle Order Control # AE-121018-300

SGS Quote #

SGS Job # JC81225

Client / Reporting Information

Company Name: Arcadis
Street Address: 10 Friends Lane, Suite 200
City: Newtown, State: PA, Zip: 18440
Project Contact: Matthew Bell, E-mail:
Phone #: 610.755.7080
Sampler(s) Name(s): C Buchanan, Phone #:

Project Information

Project Name: PPG Site 107 (Jersey City)
Street: 18 Chapel Avenue
City: Jersey City, State: NJ
Project #: NP000770.0001
Client Purchase Order #:
Project Manager: Jim Mclaughlin, Jr.

Billing Information (if different from Report to)

Company Name:
Street Address:
City, State, Zip:
Attention:

Requested Analysis

SGS Sample #	Field ID / Point of Collection	MEOH/DI Vial #	Collection Date	Collection Time	Sampled by	Grab (G) Comp (C)	Matrix	# of bottles	HCl	NaOH	HNO_3	None	DI Water	MEOH	EnCore	Total Chromium	Hexavalent Chromium	Trivalent Chromium	Antimony	Nickel	Thallium	Vanadium	LAB USE ONLY
1	FB(20190111)-A1		1/11/19	1315	CC	G	FB	2			1	1				X	X	X	X	X	X	X	
2	BS-A10		1/10/19	1300	CC	G	SO	1				1				X	X	X	X	X	X	X	A4
3	BS-A11		1/10/19	1305	CC	G	SO	1				1				X	X	X	X	X	X	X	M23
4	BS-A12		1/10/19	1310	CC	G	SO	1				1				X	X	X	X	X	X	X	
5	BS-A12S		1/10/19	1315	CC	G	SO	1				1				X	X	X	X	X	X	X	C39

1/11/2019

Turn Around Time (Business Days)

Approved By (SGS PM): / Date:

- [ ] 10 Business Days
- [ ] 5 Business Days
- [ ] 3 Business Days*
- [X] 2 Business Days*
- [ ] 1 Business Day*
- [ ] Other

All data available via Lablink

* Approval needed for 1-3 Business Day TAT

Deliverable

- [ ] Commercial "A" (Level 1)
- [ ] Commercial "B" (Level 2)
- [ ] NJ Reduced (Level 3)
- [ ] Full Tier I (Level 4)
- [ ] Commercial "C"
- [ ] NJ DKQP
- [ ] NYASP Category A
- [ ] NYASP Category B
- [ ] MA MCP Criteria
- [ ] CT RCP Criteria
- [ ] State Forms
- [X] EDD Format _Equis_
- [ ] DOD-QSM5

Commercial "A" = Results only; Commercial "B" = Results + QC Summary
Commercial "C" = Results + QC Summary + Partial Raw data

Comments / Special Instructions

http://www.sgs.com/en/terms-and-conditions

Sample Custody must be documented below each time samples change possession, including courier delivery.

Relinquished by:	Date / Time:	Received By:	Relinquished By:	Date / Time:	Received By:
1		1 SGS COURIOR	2 SGS COURIOR	1/11/19 1607	2
3		3	4		4
5		5 6°	Custody Seal # 27832 Intact / Not intact	Preserved where applicable / Absent	On Ice / Therm. ID	Cooler Temp. °C

INITIAL ASSESSMENT 3B 07

LABEL VERIFICATION_____

Copy of SGS Post Ex Sample COCs 20190111

JC81225: Chain of Custody
Page 1 of 5

Report of Analysis

Client Sample ID:	FB(20190111)-A1		
Lab Sample ID:	JC81225-1	**Date Sampled:**	01/11/19
Matrix:	AQ - Field Blank Soil	**Date Received:**	01/11/19
		Percent Solids:	n/a
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	< 0.010	0.010	mg/l	1	01/11/19 18:30	DC	SW846 7196A
Redox Potential Vs H2	269		mv	1	01/14/19 15:32	RI	ASTM D1498-76
pH [a]	6.47		su	1	01/11/19 16:41	JP	SM4500H+ B-11

(a) Sample received out of holding time for pH analysis.

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-A10		
Lab Sample ID:	JC81225-2	**Date Sampled:**	01/11/19
Matrix:	SO - Soil	**Date Received:**	01/11/19
		Percent Solids:	86.2
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	1.1 J-	0.46	mg/kg	1	01/15/19 14:58	DC	SW846 3060A/7196A
Redox Potential Vs H2	268		mv	1	01/14/19 15:53	RI	ASTM D1498-76M
Solids, Percent	86.2		%	1	01/12/19 13:30	RC	SM2540 G 18TH ED MOD
pH	6.75 J		su	1	01/14/19 15:26	RI	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-A11		
Lab Sample ID:	JC81225-3	**Date Sampled:**	01/11/19
Matrix:	SO - Soil	**Date Received:**	01/11/19
		Percent Solids:	86.8
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	1.9 J-	0.46	mg/kg	1	01/15/19 14:58	DC	SW846 3060A/7196A
Redox Potential Vs H2	265		mv	1	01/14/19 15:55	RI	ASTM D1498-76M
Solids, Percent	86.8		%	1	01/12/19 13:30	RC	SM2540 G 18TH ED MOD
pH	7.59 J		su	1	01/14/19 15:32	RI	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-A12		
Lab Sample ID:	JC81225-4	**Date Sampled:**	01/11/19
Matrix:	SO - Soil	**Date Received:**	01/11/19
		Percent Solids:	77.9
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	3.2 J-	0.51	mg/kg	1	01/15/19 14:58	DC	SW846 3060A/7196A
Redox Potential Vs H2	267		mv	1	01/14/19 15:59	RI	ASTM D1498-76M
Solids, Percent	77.9		%	1	01/12/19 13:30	RC	SM2540 G 18TH ED MOD
pH	7.23 J		su	1	01/14/19 15:36	RI	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-A12S		
Lab Sample ID:	JC81225-5	**Date Sampled:**	01/11/19
Matrix:	SO - Soil	**Date Received:**	01/11/19
		Percent Solids:	86.5
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	2.4 J-	0.46	mg/kg	1	01/15/19 14:55	DC	SW846 3060A/7196A
Redox Potential Vs H2	266		mv	1	01/14/19 16:02	RI	ASTM D1498-76M
Solids, Percent	86.5		%	1	01/12/19 13:30	RC	SM2540 G 18TH ED MOD
pH	6.64 J		su	1	01/14/19 15:42	RI	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-A10		
Lab Sample ID:	JC81225-2R	**Date Sampled:**	01/11/19
Matrix:	SO - Soil	**Date Received:**	01/11/19
		Percent Solids:	86.2
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	1.0	0.46	mg/kg	1	01/16/19 18:04	DC	SW846 3060A/7196A

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-A11		
Lab Sample ID:	JC81225-3R	**Date Sampled:**	01/11/19
Matrix:	SO - Soil	**Date Received:**	01/11/19
		Percent Solids:	86.8
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	2.3	0.46	mg/kg	1	01/16/19 18:04	DC	SW846 3060A/7196A

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-A12		
Lab Sample ID:	JC81225-4R	**Date Sampled:**	01/11/19
Matrix:	SO - Soil	**Date Received:**	01/11/19
		Percent Solids:	77.9
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	2.5	0.51	mg/kg	1	01/16/19 18:04	DC	SW846 3060A/7196A

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-A12S		
Lab Sample ID:	JC81225-5R	**Date Sampled:**	01/11/19
Matrix:	SO - Soil	**Date Received:**	01/11/19
		Percent Solids:	86.5
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	0.75	0.46	mg/kg	1	01/16/19 18:00	DC	SW846 3060A/7196A

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-A12S		
Lab Sample ID:	JC81225-5RT	**Date Sampled:**	01/11/19
Matrix:	SO - Soil	**Date Received:**	01/11/19
		Percent Solids:	86.5
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Iron, Ferrous [a]	0.63 J	0.20	%	1	01/23/19 13:10	MP	ASTM D3872-86
Sulfide Screen [b]	NEGATIVE UJ			1	01/23/19 13:10	MP	SM4500S2- A-11
Total Organic Carbon [c]	13500	120	mg/kg	1	01/18/19 20:58	JO	LLOYD KAHN 1988 MOD

(a) The ferrous iron test was analyzed after completion of Cr6 testing (outside of normal hold times for this parameter) in order to provide more information about the possible impact of the sample matrix on Cr6 recoveries.
(b) The sulfide screen test was analyzed after completion of Cr6 testing (outside of normal hold times for this parameter) in order to provide more information about the possible impact of the sample matrix on Cr6 recoveries.
(c) Multiple injections indicate possible sample non-homogeneity.

RL = Reporting Limit

Report of Analysis

Client Sample ID: FB(20190111)-A1
Lab Sample ID: JC81225-1A
Matrix: AQ - Field Blank Soil
Project: PPG Site 107, 18 Chapel Avenue, Jersey City, NJ

Date Sampled: 01/11/19
Date Received: 01/11/19
Percent Solids: n/a

Total Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 6.0	6.0	ug/l	1	01/12/19	01/14/19	ND	SW846 6010D [1]	SW846 3010A [2]
Chromium	< 10	10	ug/l	1	01/12/19	01/14/19	ND	SW846 6010D [1]	SW846 3010A [2]
Nickel	< 10	10	ug/l	1	01/12/19	01/14/19	ND	SW846 6010D [1]	SW846 3010A [2]
Thallium	< 10	10	ug/l	1	01/12/19	01/14/19	ND	SW846 6010D [1]	SW846 3010A [2]
Vanadium	< 50	50	ug/l	1	01/12/19	01/14/19	ND	SW846 6010D [1]	SW846 3010A [2]

(1) Instrument QC Batch: MA45977
(2) Prep QC Batch: MP12063

RL = Reporting Limit

Report of Analysis

Client Sample ID:	FB(20190111)-A1		
Lab Sample ID:	JC81225-1A	**Date Sampled:**	01/11/19
Matrix:	AQ - Field Blank Soil	**Date Received:**	01/11/19
		Percent Solids:	n/a
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	< 0.020	0.020	mg/l	1	01/14/19 16:18	ND	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-A10		
Lab Sample ID:	JC81225-2A	**Date Sampled:**	01/11/19
Matrix:	SO - Soil	**Date Received:**	01/11/19
		Percent Solids:	86.2
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 2.3	2.3	mg/kg	1	01/11/19	01/14/19	ND	SW846 6010D [1]	SW846 3050B [2]
Chromium	12.0	1.1	mg/kg	1	01/11/19	01/14/19	ND	SW846 6010D [1]	SW846 3050B [2]
Nickel	8.1	4.6	mg/kg	1	01/11/19	01/14/19	ND	SW846 6010D [1]	SW846 3050B [2]
Thallium	< 1.1	1.1	mg/kg	1	01/11/19	01/14/19	ND	SW846 6010D [1]	SW846 3050B [2]
Vanadium	18.7	5.7	mg/kg	1	01/11/19	01/14/19	ND	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA45974
(2) Prep QC Batch: MP12061

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-A10		
Lab Sample ID:	JC81225-2A	**Date Sampled:**	01/11/19
Matrix:	SO - Soil	**Date Received:**	01/11/19
		Percent Solids:	86.2
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	10.9	1.6	mg/kg	1	01/15/19 14:58	DC	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-A11		
Lab Sample ID:	JC81225-3A	**Date Sampled:**	01/11/19
Matrix:	SO - Soil	**Date Received:**	01/11/19
		Percent Solids:	86.8
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 2.3	2.3	mg/kg	1	01/11/19	01/14/19	ND	SW846 6010D [1]	SW846 3050B [2]
Chromium	14.4	1.1	mg/kg	1	01/11/19	01/14/19	ND	SW846 6010D [1]	SW846 3050B [2]
Nickel	11.8	4.5	mg/kg	1	01/11/19	01/14/19	ND	SW846 6010D [1]	SW846 3050B [2]
Thallium	< 1.1	1.1	mg/kg	1	01/11/19	01/14/19	ND	SW846 6010D [1]	SW846 3050B [2]
Vanadium	21.3	5.6	mg/kg	1	01/11/19	01/14/19	ND	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA45974
(2) Prep QC Batch: MP12061

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-A11		
Lab Sample ID:	JC81225-3A	**Date Sampled:**	01/11/19
Matrix:	SO - Soil	**Date Received:**	01/11/19
		Percent Solids:	86.8
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	12.5	1.6	mg/kg	1	01/15/19 14:58	DC	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-A12		
Lab Sample ID:	JC81225-4A	**Date Sampled:**	01/11/19
Matrix:	SO - Soil	**Date Received:**	01/11/19
		Percent Solids:	77.9
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 2.5	2.5	mg/kg	1	01/11/19	01/14/19	ND	SW846 6010D [1]	SW846 3050B [2]
Chromium	23.7	1.2	mg/kg	1	01/11/19	01/14/19	ND	SW846 6010D [1]	SW846 3050B [2]
Nickel	7.0	4.9	mg/kg	1	01/11/19	01/14/19	ND	SW846 6010D [1]	SW846 3050B [2]
Thallium	< 1.2	1.2	mg/kg	1	01/11/19	01/14/19	ND	SW846 6010D [1]	SW846 3050B [2]
Vanadium	12.3	6.2	mg/kg	1	01/11/19	01/14/19	ND	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA45974
(2) Prep QC Batch: MP12061

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-A12		
Lab Sample ID:	JC81225-4A	**Date Sampled:**	01/11/19
Matrix:	SO - Soil	**Date Received:**	01/11/19
		Percent Solids:	77.9
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	20.5	1.7	mg/kg	1	01/15/19 14:58	DC	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-A12S		
Lab Sample ID:	JC81225-5A	**Date Sampled:**	01/11/19
Matrix:	SO - Soil	**Date Received:**	01/11/19
		Percent Solids:	86.5
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 2.2	2.2	mg/kg	1	01/11/19	01/14/19	ND	SW846 6010D [1]	SW846 3050B [2]
Chromium	24.7	1.1	mg/kg	1	01/11/19	01/14/19	ND	SW846 6010D [1]	SW846 3050B [2]
Nickel	16.2	4.4	mg/kg	1	01/11/19	01/14/19	ND	SW846 6010D [1]	SW846 3050B [2]
Thallium	< 1.1	1.1	mg/kg	1	01/11/19	01/14/19	ND	SW846 6010D [1]	SW846 3050B [2]
Vanadium	21.9	5.6	mg/kg	1	01/11/19	01/14/19	ND	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA45974
(2) Prep QC Batch: MP12061

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-A12S		
Lab Sample ID:	JC81225-5A	**Date Sampled:**	01/11/19
Matrix:	SO - Soil	**Date Received:**	01/11/19
		Percent Solids:	86.5
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	22.3	1.6	mg/kg	1	01/15/19 14:55	DC	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

ARCADIS Design & Consultancy for natural and built assets

PPG Industries

DATA QUALITY ASSESSMENT

Site 107 Fashionland

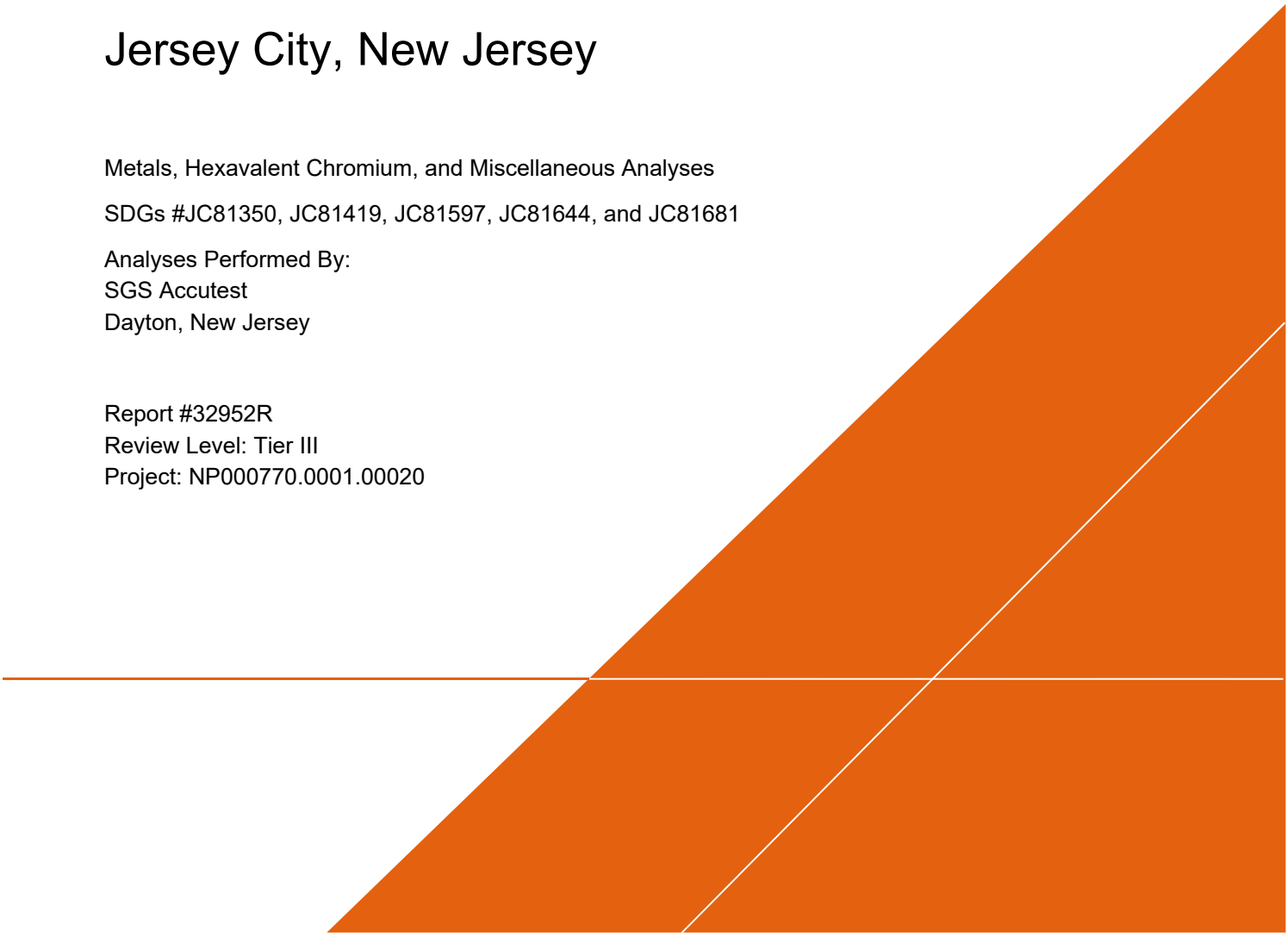
Jersey City, New Jersey

Metals, Hexavalent Chromium, and Miscellaneous Analyses

SDGs #JC81350, JC81419, JC81597, JC81644, and JC81681

Analyses Performed By:
SGS Accutest
Dayton, New Jersey

Report #32952R
Review Level: Tier III
Project: NP000770.0001.00020



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Groups (SDGs) # JC81350, JC81419, JC81597, JC81644, and JC81681 for samples collected in association with the PPG Industries Site 107 Fashionland, Jersey City, New Jersey Site. The review was conducted as a Tier III evaluation and included review of data package completeness. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

SDG	Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis		
						Cr VI	MET	MISC
JC81350	FB(20190115)-A1	JC81350-1	Water	1/15/2019		X	X	X
	BS-A0	JC81350-2	Soil	1/15/2019		X	X	X
JC81419	FB(20190116)	JC81419-1	Water	1/16/2019		X	X	X
	BS-A9V	JC81419-2	Soil	1/16/2019		X	X	X
	107_M020N(A)	JC81419-3	Soil	1/16/2019		X	X	X
JC81597	FB(20190118)	JC81597-1	Water	1/18/2019		X	X	X
	BS-A0S	JC81597-2	Soil	1/18/2019		X	X	X
JC81644	FB(20190121)-A1	JC81644-1	Water	1/21/2019		X	X	X
	BS-A14	JC81644-3	Soil	1/21/2019		X	X	X
	107-M028E2	JC81644-4	Soil	1/21/2019		X	X	X
JC81681	FB(20190122)	JC81681-1	Water	1/22/2019		X	X	X
	107-M028W	JC81681-2	Soil	1/22/2019		X	X	X
	BS-A15	JC81681-3	Soil	1/22/2019		X	X	X
	107-M030E2	JC81681-4	Soil	1/22/2019		X	X	X
	BS-A16S	JC81681-5	Soil	1/22/2019		X	X	X
	DUP-02(20190122)RR	JC81681-6	Soil	1/22/2019	107-M028W	X	X	X
	BS-A16I	JC81681-7	Soil	1/22/2019		X	X	X

Notes:

1. Metals include antimony, chromium, nickel, thallium, and vanadium. Trivalent chromium is reported by calculation (Chromium) – (Hexavalent Chromium).
2. Cr VI is hexavalent chromium.
3. Miscellaneous parameters include pH and redox potential.
4. SDGs #JC81419 and JC81681: Miscellaneous parameters for samples BS-A9V and BS-A15 also include ferrous iron, sulfide screen, and total organic carbon (TOC).

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of QA or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

Note:
QA - Quality Assurance

INORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Methods 6010C, 7196A, and 9045D; Standard Methods (SM) 4500H+B and SM4500S2-A; Lloyd Kahn; and ASTM D1498-76 and D3872-86. Data were reviewed in accordance with USEPA Region 2 SOP HW-2b, Revision 15 (December 2012); New Jersey Division of Remediation Management and Response Standard Operating Procedure for Analytical Data Validation of Hexavalent Chromium (September 2009); New Jersey Department of Environmental Protection Data Quality Assessment and Data Usability Evaluation Technical Guidance (April 2014); Field Sampling Plan/Quality Assurance Project Plan, PPG Non-Residential and Residential Chromium Sites, Hudson County, New Jersey (AECOM, June 2010); and Arcadis Quality Assurance Project Plan – Addendum, Site 107 Fashionland, Jersey City, New Jersey (Arcadis, June 2018).

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and that it was already subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with the USEPA National Functional Guidelines:

- Concentration (C) Qualifiers
  - U The analyte was analyzed for but not detected. The associated value is the analyte instrument detection limit.
  - B The reported value was obtained from a reading less than the reporting limit (RL), but greater than or equal to the method detection limit (MDL).
- Quantitation (Q) Qualifiers
  - E The reported value is estimated due to the presence of interference.
  - N Spiked sample recovery is not within control limits.
  - * Duplicate analysis is not within control limits.
- Validation Qualifiers
  - J The analyte was positively identified; however, the associated numerical value is an estimated concentration only.
  - J+ The result is an estimated quantity, but the result may be biased high.
  - J- The result is an estimated quantity, but the result may be biased low.
  - UJ The analyte was not detected above the reporting limit. However, the reported limit is approximate and may or may not represent the actual limit of detection.
  - UB Analyte considered non-detect at the listed value due to associated blank contamination.
  - R The data are unusable. The sample results are rejected due to serious deficiencies in meeting Quality Control (QC) critieria. The analyte may or may not be present in the sample.

Two facts should be noted by all data users. First, the “R” flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. “R” values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

METALS ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 6010C	Water	180 days from collection to analysis	Preserved to a pH of less than 2; Cool to <6°C
	Soil	180 days from collection to analysis	Cool to <6°C

All samples were analyzed within the specified holding times.

2. Blank Contamination

Quality assurance (QA) blanks (i.e., method and rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank is calculated for QA blanks containing concentrations greater than the method detection limit (MDL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Analytes were not detected above the MDL in the associated blanks; therefore, detected sample results were not associated with blank contamination.

3. Calibration

Satisfactory instrument calibration is established to provide that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument's continuing performance is satisfactory.

3.1 Initial Calibration and Continuing Calibration

The correct number and type of standards were analyzed. The correlation coefficient of the initial calibration was greater than 0.998 and all initial calibration verification standard and continuing calibration verification standard recoveries were within control limits of 90% to 110%.

All continuing calibration verification standard recoveries were within the control limit.

3.2 Low-Level Calibration Verification

The low-level initial and continuing calibration check standard serves to verify the linearity of calibration of the analysis at the reporting limit.

All RL standard recoveries were within control limits of 70% to 130% (50% to 150% for antimony and thallium).

3.3 ICP Interference Control Sample (ICS)

The ICS verifies the laboratories interelement and background correction factors.

All ICS exhibited recoveries within the control limits of 80% to 120%.

4. Matrix Spike/Matrix Spike Duplicate (MS/MSD)/Laboratory Duplicate Analysis

MS/MSD and laboratory duplicate data are used to assess the precision and accuracy of the analytical method.

4.1 MS/MSD Analysis

All metal analytes must exhibit a percent recovery within the established acceptance limits of 75% to 125%. The MS/MSD recovery control limits do not apply for MS/MSD performed on sample locations where the analyte's concentration detected in the parent sample exceeds the MS/MSD concentration by a factor of four or greater.

SDGs #JC81350, JC81419, JC81597, and JC81644: The MS/MSD analysis was not performed using a sample from these SDGs.

SDG #JC81681: The MS/MSD analysis performed on sample location BS-A15 exhibited recoveries within the control limits with the exception of the analytes presented in the table below.

Sample Location	Analyte	MS Recovery	MSD Recovery
BS-A15	Antimony	60.8%	66.1%

The criteria used to evaluate MS/MSD recoveries are presented in the following table. In the case of an MS/MSD deviation, the sample results are qualified. The qualifications are applied to all sample results associated with the sample preparation batch.

Control limit	Sample Result	Qualification
MS/MSD percent recovery 30% to 74%	Non-detect	UJ-
	Detect	J-
MS/MSD percent recovery < 30%	Non-detect	R
	Detect	J-
MS/MSD percent recovery > 125%	Non-detect	No Action
	Detect	J+

4.2 Laboratory Duplicate Analysis

The laboratory duplicate relative percent difference (RPD) criterion is applied when parent and duplicate sample concentrations are greater than or equal to 5 times the RL. A control limit of 20% for water matrices and 35% for soil matrices is applied when the criteria above is true. In the instance when the

parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of ± the RL is applied.

SDGs #JC81350, JC81419, JC81597, and JC81644: The laboratory duplicate analysis was not performed using a sample from these SDGs.

SDG #JC81681: MS/MSD analysis was performed in replacement of the laboratory duplicate analysis using sample BS-A15. The MS/MSD recoveries exhibited acceptable RPDs.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 50% for soil matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of three times the RL is applied for soil matrices.

Results for duplicate samples are summarized in the following table.

Sample ID/Duplicate ID	Analyte	Sample Result	Duplicate Result	RPD
107-M028W / DUP-02(20190122)RR	Chromium	18.1	19.6	8.0%
	Trivalent Chromium	17.7	19.1	7.6%
	Nickel	11.2	11.6	AC
	Vanadium	28.2	35.5	

Notes:

AC = Acceptable

The differences in the results between the parent sample 107-M028W and field duplicate sample DUP-02(20190122)RR were acceptable.

6. Laboratory Control Sample (LCS) Analysis

The LCS analysis is used to assess the accuracy of the analytical method independent of matrix interferences. The analytes associated with the LCS analysis must exhibit a percent recovery between the control limits of 80% and 120%.

The LCS analysis exhibited recoveries and RPDs within the control limits.

7. Serial Dilution

The serial dilution analysis is used to assess if a significant physical or chemical interference exists due to sample matrix. Analytes exhibiting concentrations greater than 10 times the RL in the undiluted sample are evaluated to determine if matrix interference exists. These analytes are required to have less than a 10% difference (%D) between sample results from the undiluted (parent) sample and results associated with the same sample analyzed with a five-fold dilution.

SDGs #JC81350, JC81419, JC81597, and JC81644: The serial dilution analysis was not performed using a sample from these SDGs.

SDG #JC81681: The serial dilution performed on sample location BS-A15 exhibited %D within the control limit.

8. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR METALS

METALS: SW-846 6010C	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Inductively Coupled Plasma-Atomic Emission Spectrometry (ICP-AES)					
Tier II Validation					
Holding Times		X		X	
Reporting limits (units)		X		X	
Blanks					
A. Instrument Blanks		X		X	
B. Method Blanks		X		X	
C. Equipment/Field Blanks		X		X	
Laboratory Control Sample (LCS)		X		X	
Laboratory Control Sample Duplicate (LCSD)	X				X
LCS/LCSD Precision (RPD)	X				X
Matrix Spike (MS) %R		X	X		
Matrix Spike Duplicate (MSD) %R		X	X		
MS/MSD Precision (RPD)		X		X	
Field/Lab Duplicate (RPD)		X		X	
ICP Serial Dilution %D		X		X	
Total vs. Dissolved	X				X
Reporting Limit Verification		X		X	
Tier III Validation					
Initial Calibration Verification		X		X	
Continuing Calibration Verification		X		X	
CRDL Standard Recovery		X		X	
ICP Interference Check		X		X	
ICP-MS Internal Standards	X				X
Transcription/calculations acceptable		X		X	
Raw Data	X				X
Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%R Percent recovery

RPD Relative percent difference

%D Percent difference

HEXAVALENT CHROMIUM ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 7196A	Water	24 hours from collection to analysis	Cool to <6°C
SW-846 3060A/ 7196A	Soil	30 days from collection to extraction; 7 days from extraction to analysis	Cool to <6°C

All samples were analyzed within the specified holding times.

2. Blank Contamination

Quality assurance (QA) blanks (i.e., method and rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank is calculated for QA blanks containing concentrations greater than the method detection limit (MDL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Analytes were not detected above the MDL in the associated blanks; therefore, detected sample results were not associated with blank contamination.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

The correct number and type of standards were analyzed. The correlation coefficient of the initial calibration was greater than 0.995 and all calibration verification standard recoveries were within control limits of 90% to 110%.

4. Matrix Spike (MS)/Post-Digestion Spike (PDS)/Laboratory Duplicate Analysis

MS, PDS, and laboratory duplicate data are used to assess the precision and accuracy of the analytical method.

4.1 MS Analysis

Soluble and insoluble spike sample analyses are designed to provide information about the effect of the sample matrix on the digestion and measurement methodology. The insoluble spike is used to evaluate the dissolution during the digestion process. Hexavalent chromium must exhibit a percent recovery within

the established acceptance limits of 75% to 125% in both the soluble and insoluble spiked analyses. The control limits do not apply when the parent sample concentration exceeds the spike amount by a factor of four or greater.

SDG #JC81644: The MS analysis was not performed using a sample from this SDG.

SDG #JC81597: The MS analysis performed on sample location BS-A0S in association with the insoluble and soluble hexavalent chromium analysis exhibited recoveries within the control limits.

SDGs #JC81350 and JC81681: The MS analysis performed on sample locations BS-A0 and BS-A15 in association with the insoluble hexavalent chromium analysis exhibited recoveries within the control limits.

SDGs #JC81350, JC81419, JC81681: The MS analysis performed on sample locations BS-A0, BS-A9V, and BS-A15 exhibited spike recoveries less than the lower control limits as presented in the table below.

Sample Location	Analyte	Initial Spike Recovery	Reanalysis Spike Recovery
BS-A0	Hexavalent Chromium, Soluble	68.4%	AC (78.1%)
BS-A9V	Hexavalent Chromium, Soluble	< 50%	56.7%
	Hexavalent Chromium, Insoluble	AC (103%)	71.6%
BS-A15	Hexavalent Chromium, Soluble	< 50%	< 50%

Notes:

AC = Acceptable

The criteria used to evaluate spike recoveries are presented in the following table. The qualifications are applied to all sample results associated with the sample preparation batch. In the event of a recovery outside of the control limits, the MS must be reanalyzed.

Control limit	Sample Result	Qualification[1]
Spike recovery ≥ 50% but < 75%	Non-detect	UJ-
	Detect	J-
Spike recovery < 50%	Non-detect	R
	Detect	R
Spike recovery > 125%	Non-detect	No Action
Spike recovery > 125% but ≤ 150%	Detect	J+
Spike recovery > 150%	Detect	R

Notes:

[1] If recoveries are < 50% or > 150% for both insoluble and soluble spikes, associated data will be rejected (“R”); otherwise qualify associated data if one of the spikes is outside the < 50% or > 150% limits.

SDG #JC81350: The reanalysis of the field sample is usable. No qualification of the sample results was required.

SDGs #JC81419 and JC81681: The original analyses of the field samples are usable with appropriate qualification. No sample results were rejected.

4.2 Post-Digestion Spike (PDS) Analysis

The PDS analysis is designed to verify that neither a reducing condition nor a chemical interference is affecting the analysis. This is accomplished by analyzing a second aliquot of the pH-adjusted filtrate that has been spiked with hexavalent chromium. The PDS must exhibit a percent recovery within the method acceptance limits of 85% to 115%.

SDGs #JC81350, JC81419, JC81597, and JC81681: The PDS analysis performed on sample locations BS-A0, BS-A9V, BS-A0S, and BS-A15 exhibited recoveries within the control limits.

SDG #JC81644: The PDS analysis was not performed using a sample from this SDG.

4.3 Laboratory Duplicate Analysis

The laboratory duplicate relative percent difference (RPD) criterion is applied when parent and duplicate sample concentrations are greater than or equal to four times the RL. A control limit of 20% is applied when the criteria above is true. In the instance when the parent and/or duplicate sample concentrations are less than or equal to four times the RL, a control limit of ± the RL is used.

SDGs #JC81350, JC81419, JC81597, and JC81681: The laboratory duplicate analysis performed on sample locations BS-A0, BS-A9V, BS-A0S, and BS-A15 exhibited results within the control limit.

SDG #JC81644: The laboratory duplicate analysis was not performed using a sample from this SDG.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 50% for soil matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of three times the RL is applied for soil matrices.

Results for duplicate samples are summarized in the following table.

Sample ID/Duplicate ID	Analyte	Sample Result	Duplicate Result	RPD
107-M028W / DUP-02(20190122)RR	Hexavalent Chromium	0.50 U	0.49 U	AC

Notes:

AC = Acceptable

Hexavalent chromium was not detected in the parent sample 107-M028W and field duplicate sample DUP-02(20190122)RR.

6. Laboratory Control Sample (LCS) Analysis

The LCS analysis is used to assess the precision and accuracy of the analytical method independent of matrix interferences. The analytes associated with the LCS analysis must exhibit a percent recovery between the control limits of 80% and 120%.

The LCS analysis exhibited recoveries within the control limits.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR HEXAVALENT CHROMIUM

HEXAVALENT CHROMIUM: SW-846 7196A	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Spectrophotometer					
Tier II Validation					
Holding Times		X		X	
Reporting limits (units)		X		X	
Blanks					
A. Instrument Blanks		X		X	
B. Method Blanks		X		X	
C. Equipment/Field Blanks		X		X	
Laboratory Control Sample (LCS)		X		X	
Matrix Spike (MS) %R		X	X		
Matrix Spike Duplicate (MSD) %R	X				X
MS/MSD Precision (RPD)	X				X
Post Digestion Spike %R		X		X	
Field/Lab Duplicate (RPD)		X		X	
Dilution Factor		X		X	
Tier III Validation					
Initial calibration %RSD or correlation coefficient		X		X	
Continuing calibration %R		X		X	
Raw Data		X		X	
Transcription/calculation errors present		X		X	
Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%R Percent recovery

RPD Relative percent difference

%RSD Relative percent deviation

GENERAL CHEMISTRY ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
pH by SM4500H+B	Water	QAPP: 24 hours of receipt at laboratory	Cool to <6°C
pH by SW846 9045D	Soil	QAPP: 24 hours of receipt at laboratory	Cool to <6°C
Oxidation-Reduction Potential by ASTM D1498-76	Water	Not applicable	Cool to <6°C
Oxidation-Reduction Potential (Redox) by ASTM D1498-76	Soil	Measure immediately after creating leachate	Cool to <6°C
Ferrous Iron by ASTM D3872-86	Soil	24 hours from collection to analysis	Cool to <6°C
Sulfide Screen by SM4500S2-A	Soil	7 days from collection to analysis	Cool to <6°C
Total Organic Carbon (TOC) by Lloyd Kahn	Soil	14 days from collection to analysis	Cool to <6°C

The analyses that exceeded the holding are presented in the following table.

Sample Locations	Method	Holding Time	Criteria
BS-A0S	SW846 9045D	Analysis: 3 days	< 24 hours of receipt by laboratory
BS-A9V BS-A15	ASTM D3872-86	Analysis: 7 days	< 24 hours from collection

Sample results were qualified as specified in the table below. All other holding times were met.

Criteria	Qualification	
	Detected Analytes	Non-detect Analytes
Analysis completed less than two times holding time	J	UJ
Analysis completed greater than two times holding time	J	R

2. Blank Contamination

Quality assurance (QA) blanks (i.e., method and rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank is calculated for QA blanks containing concentrations greater than the method detection limit (MDL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Method blank analysis is not applicable for Redox and pH analyses.

Ferrous iron, sulfide, and TOC were not detected above the MDL in the associated blanks; therefore, detected sample results were not associated with blank contamination.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

The correct number and type of standards were analyzed. All buffer check results were within acceptance limits.

4. Laboratory Duplicate Analysis

Laboratory duplicate data are used to assess the precision of the analytical method. The laboratory duplicate relative percent difference (RPD) criterion is applied when parent and duplicate sample concentrations are greater than or equal to 5 times the RL. A control limit of 20% for water matrices and 35% for soil matrices is applied when the criteria above is true. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of ± the RL is applied.

SDGs #JC81350, JC81419, and JC81597: The laboratory duplicate analysis was not performed using a sample from these SDGs.

SDGs #JC81644 and JC81681: The laboratory duplicate analysis performed on sample locations 107-M028E2 and BS-A15 exhibited results within the control limit.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 50% for soil matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of three times the RL is applied for soil matrices.

Results for duplicate samples are summarized in the following table.

Sample ID/Duplicate ID	Analyte	Sample Result	Duplicate Result	RPD
107-M028W / DUP-02(20190122)RR	Redox Potential	263	255	3.1%
	pH	7.07	6.93	2.0%

The differences in the results between the parent sample 107-M028W and field duplicate sample DUP-02(20190122)RR were acceptable.

6. Laboratory Control Sample (LCS) Analysis

The LCS analysis is used to assess the precision and accuracy of the analytical method independent of matrix interferences. The analytes associated with the LCS analysis must exhibit a percent recovery between the control limits of 80% and 120%.

LCS results for redox potential, pH, and sulfide screen were not reported in the analytical report.

The LCS analysis performed in association with ferrous iron and TOC exhibited recoveries within the control limits.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR GENERAL CHEMISTRY

General Chemistry: SM4500H+B, SW846 9045D, ASTM D1498-76	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Miscellaneous Instrumentation					
Tier II Validation					
Holding times		X	X		
Reporting limits (units)		X		X	
Blanks					
A. Instrument Blanks		X		X	
B. Method blanks		X		X	
C. Equipment blanks		X		X	
Laboratory Control Sample (LCS) %R		X		X	
Laboratory Control Sample Duplicate (LCSD) %R	X				X
LCS/LCSD Precision (RPD)	X				X
Matrix Spike (MS) %R	X				X
Matrix Spike Duplicate (MSD) %R	X				X
MS/MSD Precision (RPD)	X				X
Field/Lab Duplicate (RPD)		X		X	
Dilution Factor		X		X	
Tier III Validation					
Initial calibration %RSD or correlation coefficient	X				X
Continuing calibration %R	X				X
Raw Data		X		X	
Transcription/calculation errors present		X		X	
Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%R Percent recovery

RPD Relative percent difference

VALIDATION PERFORMED BY: Jennifer Singer

SIGNATURE: 

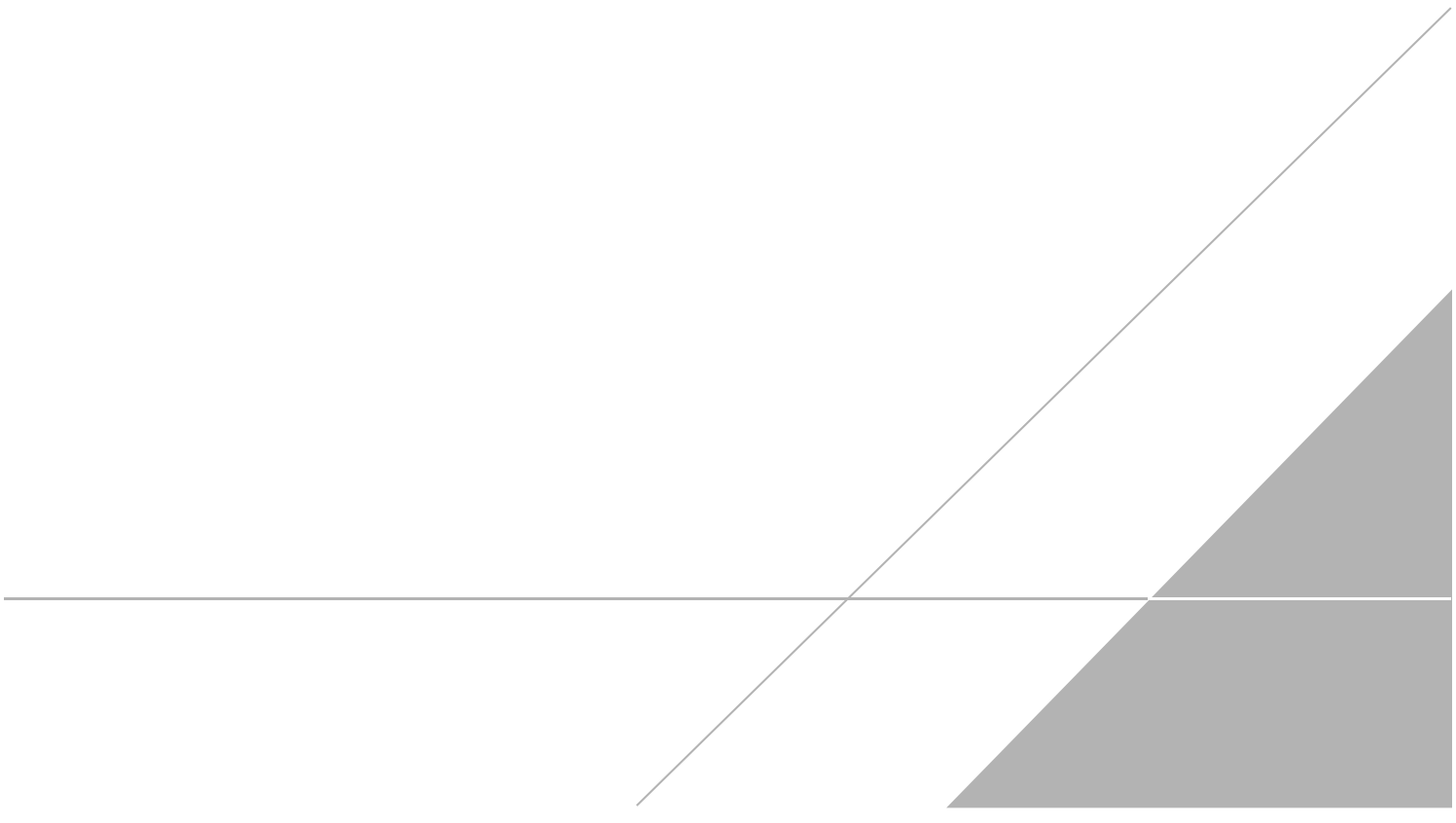
DATE: June 5, 2019

PEER REVIEW: Dennis Capria

DATE: June 27, 2019

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS



SGS

SO FB

CHAIN OF CUSTODY

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PAGE 1 OF 1 E

FED-EX Tracking #:
Bottle Order Control #: AK-121018-204
SGS Quote #:
SGS Job #: JC81350

Client / Reporting Information
Company Name: Arcadis
Street Address: 10 Friends Lane
City / State / Zip: Newtown PA 18440
Project Contact: Matt Bell
E-mail:
Phone #: 646-762-5629
Fax #:
Sampler(s) Name(s): G.Quinones
Phone #: 201-742-3460

Project Information
Project Name: PPG Jersey City Site 107
Street: 18 Chapel Avenue
City / State: Jersey City NJ
Project #: NP000770.0001.00008
Client Purchase Order #:
Project Manager: Jim McLaughlin

Billing Information (If different from Report to)
Company Name:
Street Address:
City / State / Zip:
Attention:

Requested Analysis (see TEST CODE sheet): Total chromium, Hexavalent chromium, Trivalent chromium, Vanadium, Thallium, Antimony, Nickel

Matrix Codes: DW - Drinking Water; GW - Ground Water; WW - Water; SW - Surface Water; SO - Soil; SL - Sludge; SED - Sediment; OI - Oil; LIQ - Other Liquid; AIR - Air; SOL - Other Solid; WP - Wipe; FB - Field Blank; EB - Equipment Blank; RB - Rinse Blank; TB - Trip Blank

Lab Sample #	Field ID / Point of Collection	MEOH/DI Vial #	Date	Time	Sampled by	Matrix	# of bottles	HCl	NaOH	HNO3	H2SO4	NONE	DI Water	MEOH	ENCORE	Total chromium	Hexavalent chromium	Trivalent chromium	Vanadium	Thallium	Antimony	Nickel	LAB USE ONLY
1	FB(20190115)-A1		1/15/19	1100	GQ	FB	4			2		2				X	X	X	X	X	X	X	A11
2	BS-AØ		1/15/19	1130	GQ	SO	1					1				X	X	X	X	X	X	X	G2 C39

Turnaround Time (Business days)
- [ ] Std. 10 Business Days
- [ ] 5 Day RUSH
- [ ] 3 Day RUSH
- [x] 2 Day RUSH
- [ ] 1 Day RUSH
- [ ] other

Approved by (SGS Project Manager)/Date:

Emergency & Rush T/A data available via LabLink

Data Deliverable Information
- [ ] Commercial "A" (Level 1)
- [ ] Commercial "B" (Level 2)
- [ ] FULLT1 (Level 3+4)
- [ ] NJ Reduced
- [ ] Commercial "C"
- [ ] NJ Data of Known Quality Protocol Reporting
- [ ] NYASP Category A
- [ ] NYASP Category B
- [ ] State Forms
- [x] EDD Format EQUIS
- [ ] Other

Commercial "A" = Results Only; Commercial "B" = Results + QC Summary
NJ Reduced = Results + QC Summary + Partial Raw data

Comments / Special Instructions
INITIAL ASESSMENT JR 3B
LABEL VERIFICATION

Sample inventory is verified upon receipt in the Laboratory

Sample Custody must be documented below each time samples change possession, including courier delivery.

Relinquished by Sampler:	Date Time:	Received By:	Relinquished By:	Date Time:	Received By:
1 [signature]	1-15-19 1400	1 Robert Chambers	2 Robert Chambers	1-15-19 1534	2 [signature]
3 Relinquished by Sampler:	Date Time:	3 Received By:	4 Relinquished By:	Date Time:	4 Received By:
5 Relinquished by:	Date Time:	5 Received By:	Custody Seal # 11474	☐ Intact ☐ Not intact; Preserved where applicable ☐	On Ice ☒ IR Cooler Temp. 3.2 °C

Form:SM088-03C (revised 2/12/18)

http://www.sgs.com/en/terms-and-conditions.

JC81350: Chain of Custody
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5.2
5

Report of Analysis

Client Sample ID:	FB(20190115)-A1		
Lab Sample ID:	JC81350-1	**Date Sampled:**	01/15/19
Matrix:	AQ - Field Blank Soil	**Date Received:**	01/15/19
		Percent Solids:	n/a
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	< 0.010	0.010	mg/l	1	01/15/19 21:05	DC	SW846 7196A
Redox Potential Vs H2	290		mv	1	01/16/19 12:04	RI	ASTM D1498-76
pH [a]	5.54		su	1	01/15/19 16:00	FR	SM4500H+ B-11

(a) Sample received out of holding time for pH analysis.

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-A0		
Lab Sample ID:	JC81350-2	**Date Sampled:**	01/15/19
Matrix:	SO - Soil	**Date Received:**	01/15/19
		Percent Solids:	84.8
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
~~Chromium, Hexavalent~~	~~0.93~~	~~0.47~~	~~mg/kg~~	~~1~~	~~01/16/19 17:05~~	~~DC~~	~~SW846 3060A/7196A~~
Redox Potential Vs H2	276		mv	1	01/16/19 15:28	RI	ASTM D1498-76M
Solids, Percent	84.8		%	1	01/16/19 09:11	RC	SM2540 G 18TH ED MOD
pH	7.23		su	1	01/16/19 15:17	RI	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-A0		
Lab Sample ID:	JC81350-2R	**Date Sampled:**	01/15/19
Matrix:	SO - Soil	**Date Received:**	01/15/19
		Percent Solids:	84.8
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	0.87	0.47	mg/kg	1	01/21/19 13:04	RI	SW846 3060A/7196A

RL = Reporting Limit

Report of Analysis

Client Sample ID: FB(20190115)-A1
Lab Sample ID: JC81350-1A
Matrix: AQ - Field Blank Soil
Project: PPG Site 107, 18 Chapel Avenue, Jersey City, NJ

Date Sampled: 01/15/19
Date Received: 01/15/19
Percent Solids: n/a

Total Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 6.0	6.0	ug/l	1	01/15/19	01/16/19	ND	SW846 6010D [1]	SW846 3010A [2]
Chromium	< 10	10	ug/l	1	01/15/19	01/16/19	ND	SW846 6010D [1]	SW846 3010A [2]
Nickel	< 10	10	ug/l	1	01/15/19	01/16/19	ND	SW846 6010D [1]	SW846 3010A [2]
Thallium	< 10	10	ug/l	1	01/15/19	01/16/19	ND	SW846 6010D [1]	SW846 3010A [2]
Vanadium	< 50	50	ug/l	1	01/15/19	01/16/19	ND	SW846 6010D [1]	SW846 3010A [2]

(1) Instrument QC Batch: MA45992
(2) Prep QC Batch: MP12103

RL = Reporting Limit

Report of Analysis

Client Sample ID:	FB(20190115)-A1		
Lab Sample ID:	JC81350-1A	**Date Sampled:**	01/15/19
Matrix:	AQ - Field Blank Soil	**Date Received:**	01/15/19
		Percent Solids:	n/a
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	< 0.020	0.020	mg/l	1	01/16/19 15:11	ND	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-A0		
Lab Sample ID:	JC81350-2A	**Date Sampled:**	01/15/19
Matrix:	SO - Soil	**Date Received:**	01/15/19
		Percent Solids:	84.8
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 2.3	2.3	mg/kg	1	01/15/19	01/16/19	ND	SW846 6010D [1]	SW846 3050B [2]
Chromium	18.0	1.2	mg/kg	1	01/15/19	01/16/19	ND	SW846 6010D [1]	SW846 3050B [2]
Nickel	16.6	4.6	mg/kg	1	01/15/19	01/16/19	ND	SW846 6010D [1]	SW846 3050B [2]
Thallium	< 1.2	1.2	mg/kg	1	01/15/19	01/16/19	ND	SW846 6010D [1]	SW846 3050B [2]
Vanadium	25.7	5.8	mg/kg	1	01/15/19	01/16/19	ND	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA45992
(2) Prep QC Batch: MP12101

RL = Reporting Limit

Report of Analysis

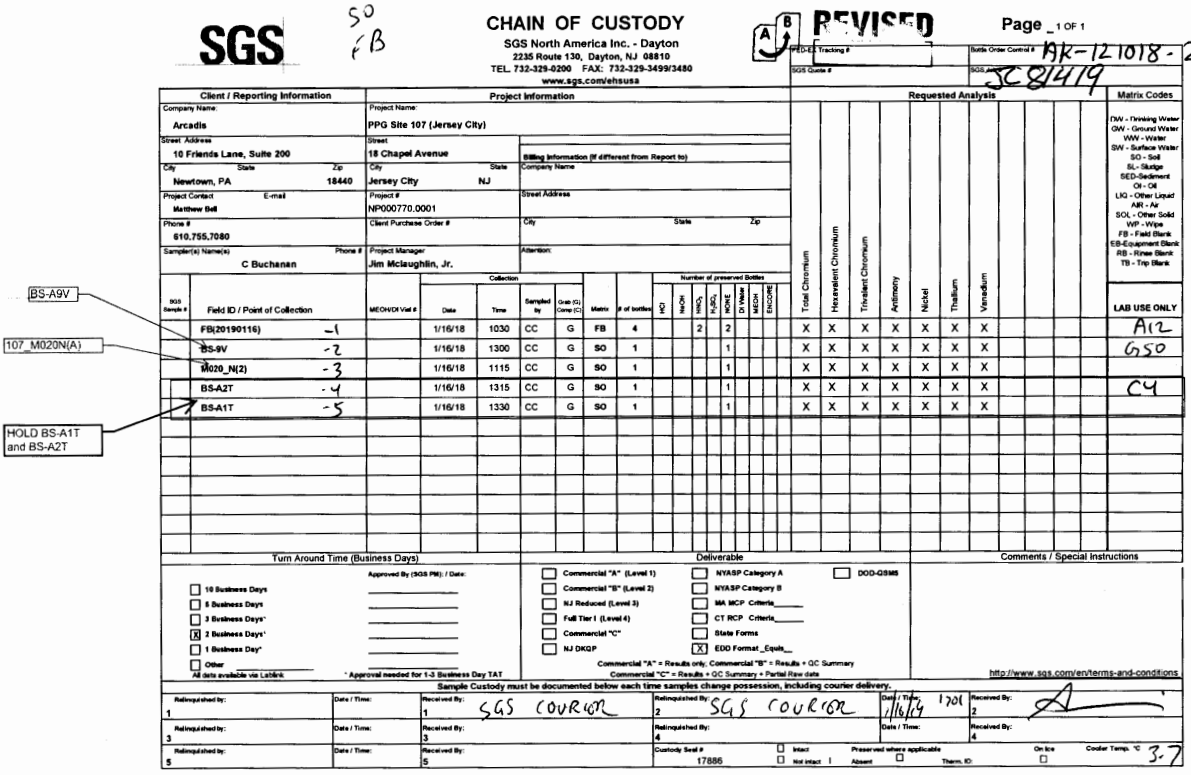
Client Sample ID:	BS-A0		
Lab Sample ID:	JC81350-2A	**Date Sampled:**	01/15/19
Matrix:	SO - Soil	**Date Received:**	01/15/19
		Percent Solids:	84.8
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	17.1	1.7	mg/kg	1	01/16/19 17:05	DC	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit



SGS

SO
FB

CHAIN OF CUSTODY

SGS North America Inc. - Dayton
2235 Route 130, Dayton, NJ 08810
TEL. 732-329-0200 FAX: 732-329-3499/3480
www.sgs.com/ehsusa

REVISED

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SGS Quote #

Bottle Order Control # AR-121018-205

SGS Job # JC81419

Client / Reporting Information

Company Name: Arcadis
Street Address: 10 Friends Lane, Suite 200
City: Newtown, PA State: Zip: 18440
Project Contact: Matthew Bell E-mail:
Phone #: 610.755.7080
Sampler(s) Name(s): C Buchanan Phone #:

Project Information

Project Name: PPG Site 107 (Jersey City)
Street: 18 Chapel Avenue
City: Jersey City State: NJ
Project #: NP000770.0001
Client Purchase Order #:
Project Manager: Jim Mclaughlin, Jr.

Billing Information (If different from Report to)
Company Name:
Street Address:
City State Zip:
Attention:

Requested Analysis

Matrix Codes: DW - Drinking Water; GW - Ground Water; WW - Water; SW - Surface Water; SO - Soil; SL - Sludge; SED-Sediment; OI - Oil; LIQ - Other Liquid; AIR - Air; SOL - Other Solid; WP - Wipe; FB - Field Blank; EB-Equipment Blank; RB - Rinse Blank; TB - Trip Blank

SGS Sample #	Field ID / Point of Collection	MEOH/DI Vial #	Collection Date	Time	Sampled By	Grab (G) Comp (C)	Matrix	# of bottles	HCl	MeOH	H2SO4	NaOH	None	DI Water	MeOH	EnCore	Total Chromium	Hexavalent Chromium	Trivalent Chromium	Antimony	Nickel	Thallium	Vanadium	LAB USE ONLY
	FB(20190116) -1		1/16/18	1030	CC	G	FB	4			2	2					X	X	X	X	X	X	X	A12
	BS-9V -2		1/16/18	1300	CC	G	SO	1				1					X	X	X	X	X	X	X	G50
	M020_N(2) -3		1/16/18	1115	CC	G	SO	1				1					X	X	X	X	X	X	X	
	BS-A2T -4		1/16/18	1315	CC	G	SO	1				1					X	X	X	X	X	X	X	C4
	BS-A1T -5		1/16/18	1330	CC	G	SO	1				1					X	X	X	X	X	X	X	

BS-A9V
107_M020N(A)
HOLD BS-A1T and BS-A2T

Turn Around Time (Business Days)

Approved By (SGS PM): / Date:

- [ ] 10 Business Days
- [ ] 5 Business Days
- [ ] 3 Business Days*
- [X] 2 Business Days*
- [ ] 1 Business Day*
- [ ] Other

All data available via Labilink. * Approval needed for 1-3 Business Day TAT

Deliverable

- [ ] Commercial "A" (Level 1)
- [ ] Commercial "B" (Level 2)
- [ ] NJ Reduced (Level 3)
- [ ] Full Tier I (Level 4)
- [ ] Commercial "C"
- [ ] NJ DKQP
- [ ] NYASP Category A
- [ ] NYASP Category B
- [ ] MA MCP Criteria____
- [ ] CT RCP Criteria____
- [ ] State Forms
- [X] EDD Format _Equis_
- [ ] DOD-QSM5

Commercial "A" = Results only; Commercial "B" = Results + QC Summary
Commercial "C" = Results + QC Summary + Partial Raw data

Comments / Special Instructions

http://www.sgs.com/en/terms-and-conditions

Sample Custody must be documented below each time samples change possession, including courier delivery.

Relinquished by:	Date / Time:	Received By:	Relinquished By:	Date / Time:	Received By:
1		1 SGS COURIER	2 SGS COURIER	1/16/18 1701	2
3		3	4		4
5		5	Custody Seal # 17886 Intact / Not Intact	Preserved where applicable / Absent	On Ice / Therm. ID	Cooler Temp. °C 3.7

INITIAL ASESSMENT 3A 1/17

LABEL VERIFICATION _____

SGS Post Ex Sample COCs Template 20190109

JC81419: Chain of Custody
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Report of Analysis

Client Sample ID:	FB(20190116)		
Lab Sample ID:	JC81419-1	**Date Sampled:**	01/16/19
Matrix:	AQ - Field Blank Soil	**Date Received:**	01/16/19
		Percent Solids:	n/a
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	< 0.010	0.010	mg/l	1	01/16/19 22:45	LS	SW846 7196A
Redox Potential Vs H2	341		mv	1	01/17/19 14:39	EB	ASTM D1498-76
pH [a]	4.24		su	1	01/16/19 17:10	SUB	SM4500H+ B-11

(a) Sample received out of holding time for pH analysis.

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-A9V		
Lab Sample ID:	JC81419-2	**Date Sampled:**	01/16/19
Matrix:	SO - Soil	**Date Received:**	01/16/19
		Percent Solids:	81.0
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	2.4 J-	0.49	mg/kg	1	01/17/19 16:50	DC	SW846 3060A/7196A
Redox Potential Vs H2	280		mv	1	01/17/19 12:50	EB	ASTM D1498-76M
Solids, Percent	81		%	1	01/17/19 09:00	RC	SM2540 G 18TH ED MOD
pH	7.09		su	1	01/17/19 09:58	EB	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID:	107_M020N(A)		
Lab Sample ID:	JC81419-3	**Date Sampled:**	01/16/19
Matrix:	SO - Soil	**Date Received:**	01/16/19
		Percent Solids:	84.3
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	1.6 J-	0.47	mg/kg	1	01/17/19 16:53	DC	SW846 3060A/7196A
Redox Potential Vs H2	276		mv	1	01/17/19 12:53	EB	ASTM D1498-76M
Solids, Percent	84.3		%	1	01/17/19 09:00	RC	SM2540 G 18TH ED MOD
pH	8.14		su	1	01/17/19 10:02	EB	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-A9V		
Lab Sample ID:	JC81419-2R	**Date Sampled:**	01/16/19
Matrix:	SO - Soil	**Date Received:**	01/16/19
		Percent Solids:	81.0
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	< 0.49	0.49	mg/kg	1	01/21/19 15:05	RI	SW846 3060A/7196A

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-A9V		
Lab Sample ID:	JC81419-2RT	**Date Sampled:**	01/16/19
Matrix:	SO - Soil	**Date Received:**	01/16/19
		Percent Solids:	81.0
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Iron, Ferrous [a]	0.56 J	0.20	%	1	01/23/19 13:10	MP	ASTM D3872-86
Sulfide Screen [b]	NEGATIVE			1	01/23/19 13:10	MP	SM4500S2- A-11
Total Organic Carbon	1780	120	mg/kg	1	01/25/19 22:58	CD	LLOYD KAHN 1988 MOD

(a) The ferrous iron test was analyzed after completion of Cr6 testing (outside of normal hold times for this parameter) in order to provide more information about the possible impact of the sample matrix on Cr6 recoveries.
(b) The sulfide screen test was analyzed after completion of Cr6 testing (outside of normal hold times for this parameter) in order to provide more information about the possible impact of the sample matrix on Cr6 recoveries.

RL = Reporting Limit

Report of Analysis

Client Sample ID:	107_M020N(A)		
Lab Sample ID:	JC81419-3R	**Date Sampled:**	01/16/19
Matrix:	SO - Soil	**Date Received:**	01/16/19
		Percent Solids:	84.3
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	1.2	0.47	mg/kg	1	01/21/19 15:06	RI	SW846 3060A/7196A

RL = Reporting Limit

Report of Analysis

Client Sample ID: FB(20190116)
Lab Sample ID: JC81419-1A
Matrix: AQ - Field Blank Soil
Project: PPG Site 107, 18 Chapel Avenue, Jersey City, NJ

Date Sampled: 01/16/19
Date Received: 01/16/19
Percent Solids: n/a

Total Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 6.0	6.0	ug/l	1	01/17/19	01/17/19	GT	SW846 6010D [1]	SW846 3010A [2]
Chromium	< 10	10	ug/l	1	01/17/19	01/17/19	GT	SW846 6010D [1]	SW846 3010A [2]
Nickel	< 10	10	ug/l	1	01/17/19	01/17/19	GT	SW846 6010D [1]	SW846 3010A [2]
Thallium	< 10	10	ug/l	1	01/17/19	01/17/19	GT	SW846 6010D [1]	SW846 3010A [2]
Vanadium	< 50	50	ug/l	1	01/17/19	01/17/19	GT	SW846 6010D [1]	SW846 3010A [2]

(1) Instrument QC Batch: MA45999
(2) Prep QC Batch: MP12109

RL = Reporting Limit

Report of Analysis

Client Sample ID:	FB(20190116)		
Lab Sample ID:	JC81419-1A	**Date Sampled:**	01/16/19
Matrix:	AQ - Field Blank Soil	**Date Received:**	01/16/19
		Percent Solids:	n/a
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	< 0.020	0.020	mg/l	1	01/17/19 15:50	GT	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-A9V		
Lab Sample ID:	JC81419-2A	**Date Sampled:**	01/16/19
Matrix:	SO - Soil	**Date Received:**	01/16/19
		Percent Solids:	81.0
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 2.4	2.4	mg/kg	1	01/17/19	01/17/19	ND	SW846 6010D [1]	SW846 3050B [2]
Chromium	78.3	1.2	mg/kg	1	01/17/19	01/17/19	ND	SW846 6010D [1]	SW846 3050B [2]
Nickel	9.5	4.7	mg/kg	1	01/17/19	01/17/19	ND	SW846 6010D [1]	SW846 3050B [2]
Thallium	< 1.2	1.2	mg/kg	1	01/17/19	01/17/19	ND	SW846 6010D [1]	SW846 3050B [2]
Vanadium	20.0	5.9	mg/kg	1	01/17/19	01/17/19	ND	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA46001
(2) Prep QC Batch: MP12125

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-A9V		
Lab Sample ID:	JC81419-2A	**Date Sampled:**	01/16/19
Matrix:	SO - Soil	**Date Received:**	01/16/19
		Percent Solids:	81.0
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	75.9	1.7	mg/kg	1	01/17/19 16:50	DC	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	107_M020N(A)		
Lab Sample ID:	JC81419-3A	**Date Sampled:**	01/16/19
Matrix:	SO - Soil	**Date Received:**	01/16/19
		Percent Solids:	84.3
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 2.3	2.3	mg/kg	1	01/17/19	01/17/19	ND	SW846 6010D [1]	SW846 3050B [2]
Chromium	22.5	1.2	mg/kg	1	01/17/19	01/17/19	ND	SW846 6010D [1]	SW846 3050B [2]
Nickel	16.0	4.7	mg/kg	1	01/17/19	01/17/19	ND	SW846 6010D [1]	SW846 3050B [2]
Thallium	< 1.2	1.2	mg/kg	1	01/17/19	01/17/19	ND	SW846 6010D [1]	SW846 3050B [2]
Vanadium	23.2	5.9	mg/kg	1	01/17/19	01/17/19	ND	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA46001
(2) Prep QC Batch: MP12125

RL = Reporting Limit

Report of Analysis

Client Sample ID:	107_M020N(A)		
Lab Sample ID:	JC81419-3A	**Date Sampled:**	01/16/19
Matrix:	SO - Soil	**Date Received:**	01/16/19
		Percent Solids:	84.3
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	20.9	1.7	mg/kg	1	01/17/19 16:53	DC	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

SO
FB

SGS CHAIN OF CUSTODY

SGS North America Inc. - Dayton
2235 Route 130, Dayton, NJ 08810
TEL. 732-329-0200 FAX: 732-329-3499/3480
www.sgs.com/ehsusa

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FED-EX Tracking #:
Bottle Order Control #: 15-361418-180
SGS Quote #:
SGS Job #: JC81597

Client / Reporting Information

Company Name: Arcadis
Street Address: 10 Friends Lane, Suite 200
City: Newtown, PA State: Zip: 18440
Project Contact: Matthew Bell E-mail:
Phone #: 610.755.7080
Sampler(s) Name(s): C Cifelli Phone #:

Project Information

Project Name: PPG Site 107 (Jersey City)
Street: 18 Chapel Avenue
City: Jersey City State: NJ
Project #: NP000770.0001
Client Purchase Order #:
Project Manager: Jim Mclaughlin, Jr.

Billing Information (If different from Report to)

Company Name:
Street Address:
City: State: Zip:
Attention:

Requested Analysis

SGS Sample #	Field ID / Point of Collection	MEOH/DI Vial #	Collection Date	Collection Time	Sampled by	Grab (G) Comp (C)	Matrix	# of bottles	Number of preserved Bottles: HCl	NaOH	HNO3	H2SO4	NONE	DI Water	MEOH	ENCORE	Total Chromium	Hexavalent Chromium	Trivalent Chromium	Antimony	Nickel	Thallium	Vanadium	LAB USE ONLY
	FB(20190118)		1/18/19	1350	CC	G	FB	2			1		1				X	X	X	X	X	X	X	
2	BS-A05		1/18/19	1300	CC	G	SO	1					1				X	X	X	X	X	X	X	A12 G36 D12

Matrix Codes

DW - Drinking Water
GW - Ground Water
WW - Water
SW - Surface Water
SO - Soil
SL - Sludge
SED-Sediment
OI - Oil
LIQ - Other Liquid
AIR - Air
SOL - Other Solid
WP - Wipe
FB - Field Blank
EB-Equipment Blank
RB - Rinse Blank
TB - Trip Blank

Turn Around Time (Business Days)

Approved By (SGS PM): / Date:

- [ ] 10 Business Days
- [ ] 5 Business Days
- [ ] 3 Business Days*
- [x] 2 Business Days*
- [ ] 1 Business Day*
- [ ] Other

All data available via Labiink

* Approval needed for 1-3 Business Day TAT

Deliverable

- [ ] Commercial "A" (Level 1)
- [ ] Commercial "B" (Level 2)
- [ ] NJ Reduced (Level 3)
- [ ] Full Tier I (Level 4)
- [ ] Commercial "C"
- [ ] NJ DKQP
- [ ] NYASP Category A
- [ ] NYASP Category B
- [ ] MA MCP Criteria
- [ ] CT RCP Criteria
- [ ] State Forms
- [x] EDD Format _Equis_
- [ ] DOD-QSM5

Commercial "A" = Results only; Commercial "B" = Results + QC Summary
Commercial "C" = Results + QC Summary + Partial Raw data

Comments / Special Instructions

http://www.sgs.com/en/terms-and-conditions

Sample Custody must be documented below each time samples change possession, including courier delivery.

	Relinquished by:	Date / Time:	Received By:	Relinquished By:	Date / Time:	Received By:
1		01/19/19 1435	1 Robert Schambers	2 Robert Schambers	1/18/19 1554	2
3			3	4		4
5			5	Custody Seal # 18440	Intact / Not Intact	Preserved where applicable / Absent

On Ice: N/A
Cooler Temp °C: Ip 3.2

INITIAL ASESSMENT JR 2B
LABEL VERIFICATION:

SGS Post Ex Sample COCs Template 20190109

Report of Analysis

Client Sample ID:	FB(20190118)		
Lab Sample ID:	JC81597-1	**Date Sampled:**	01/18/19
Matrix:	AQ - Field Blank Soil	**Date Received:**	01/18/19
		Percent Solids:	n/a
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	< 0.010	0.010	mg/l	1	01/18/19 19:40	DC	SW846 7196A
Redox Potential Vs H2	356		mv	1	01/21/19 16:33	EB	ASTM D1498-76
pH [a]	6.09		su	1	01/18/19 17:07	FR	SM4500H+ B-11

(a) Sample received out of holding time for pH analysis.

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-A0S		
Lab Sample ID:	JC81597-2	**Date Sampled:**	01/18/19
Matrix:	SO - Soil	**Date Received:**	01/18/19
		Percent Solids:	87.1
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	1.1	0.46	mg/kg	1	01/22/19 15:28	DC	SW846 3060A/7196A
Redox Potential Vs H2	260		mv	1	01/21/19 12:36	EB	ASTM D1498-76M
Solids, Percent	87.1		%	1	01/21/19 08:43	RC	SM2540 G 18TH ED MOD
pH	7.74 J		su	1	01/21/19 11:53	EB	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID: FB(20190118)
Lab Sample ID: JC81597-1A
Matrix: AQ - Field Blank Soil
Project: PPG Site 107, 18 Chapel Avenue, Jersey City, NJ

Date Sampled: 01/18/19
Date Received: 01/18/19
Percent Solids: n/a

Total Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 6.0	6.0	ug/l	1	01/19/19	01/21/19	ND	SW846 6010D [1]	SW846 3010A [2]
Chromium	< 10	10	ug/l	1	01/19/19	01/21/19	ND	SW846 6010D [1]	SW846 3010A [2]
Nickel	< 10	10	ug/l	1	01/19/19	01/21/19	ND	SW846 6010D [1]	SW846 3010A [2]
Thallium	< 10	10	ug/l	1	01/19/19	01/21/19	ND	SW846 6010D [1]	SW846 3010A [2]
Vanadium	< 50	50	ug/l	1	01/19/19	01/21/19	ND	SW846 6010D [1]	SW846 3010A [2]

(1) Instrument QC Batch: MA46015
(2) Prep QC Batch: MP12177

RL = Reporting Limit

Report of Analysis

Client Sample ID:	FB(20190118)		
Lab Sample ID:	JC81597-1A	**Date Sampled:**	01/18/19
Matrix:	AQ - Field Blank Soil	**Date Received:**	01/18/19
		Percent Solids:	n/a
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	< 0.020	0.020	mg/l	1	01/21/19 15:52	ND	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-A0S		
Lab Sample ID:	JC81597-2A	**Date Sampled:**	01/18/19
Matrix:	SO - Soil	**Date Received:**	01/18/19
		Percent Solids:	87.1
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 2.3	2.3	mg/kg	1	01/19/19	01/21/19	ND	SW846 6010D [1]	SW846 3050B [2]
Chromium	26.0	1.1	mg/kg	1	01/19/19	01/21/19	ND	SW846 6010D [1]	SW846 3050B [2]
Nickel	18.4	4.5	mg/kg	1	01/19/19	01/21/19	ND	SW846 6010D [1]	SW846 3050B [2]
Thallium [a]	< 2.3	2.3	mg/kg	2	01/19/19	01/21/19	ND	SW846 6010D [1]	SW846 3050B [2]
Vanadium	43.1	5.6	mg/kg	1	01/19/19	01/21/19	ND	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA46015
(2) Prep QC Batch: MP12179

(a) Elevated detection limit due to dilution required for high interfering element.

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-A0S		
Lab Sample ID:	JC81597-2A	**Date Sampled:**	01/18/19
Matrix:	SO - Soil	**Date Received:**	01/18/19
		Percent Solids:	87.1
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	24.9	1.6	mg/kg	1	01/22/19 15:28	DC	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

SGS

SO
FB

CHAIN OF CUSTODY

SGS North America Inc. - Dayton
2235 Route 130, Dayton, NJ 08810
TEL. 732-329-0200 FAX 732-329-3499
www.sgs.com/ehsusa

PAGE 1 OF 1

FED-EX Tracking #:
Bottle Order Control #: AK-121018-208
SGS Quote #:
SGS Job #: JC81644

Client / Reporting Information

Company Name: ARCADIS
Street Address: 10 FRIENDS LANE, SUITE 200
City: NEWTOWN State: PA Zip: 18940
Project Contact: MATTHEW.BELL@ARCADIS.COM E-mail:
Phone #: 610-755-7080 Fax #:
Sampler(s) Name(s): C. CIFELLI Phone #:

Project Information

Project Name: PPG SITE 107 (JERSEY CITY)
Street: 18 Chapel Ave
City: Jersey City State: NJ
Project #: NP000770.0001
Client Purchase Order #:
Project Manager: Jim McLAUGHLIN, JR

Billing Information (If different from Report to)

Company Name:
Street Address:
City: State: Zip:
Attention:

Requested Analysis (see TEST CODE sheet)

Matrix Codes: DW - Drinking Water; GW - Ground Water; WW - Water; SW - Surface Water; SO - Soil; SL- Sludge; SED-Sediment; OI - Oil; LIQ - Other Liquid; AIR - Air; SOL - Other Solid; WP - Wipe; FB-Field Blank; EB-Equipment Blank; RB- Rinse Blank; TB-Trip Blank

Lab Sample #	Field ID / Point of Collection	MEOH/DI Vial #	Collection Date	Collection Time	Sampled by	Matrix	# of bottles	Number of preserved bottles: HCl	NaOH	HNO3	H2SO4	NONE	DI Water	MEOH	ENCORE	TOTAL CHROMIUM	HEXAVALENT CHROMIUM	TRIVALENT CHROMIUM	ANTIMONY	NICKEL	THALLIUM	VANADIUM	LAB USE ONLY
1	FB(20190121)-A1		1/21/19	1410	CC	G	2			1		1				X	X	X	X	X	X	X	A18
2	BS-A13		1/21/19	1300	CC	G	1					1				X	X	X	X	X	X	X	G3
3	BS-A14		1/21/19	1315	CC	G	1					1				X	X	X	X	X	X	X	
4	107-MW28E2		1/21/19	1425	CC	G	1					1				X	X	X	X	X	X	X	D40

Turnaround Time (Business days)

Approved by (SGS Project Manager)/Date:

- [ ] Std. 10 Business Days
- [ ] 5 Day RUSH
- [ ] 3 Day RUSH
- [x] 2 Day RUSH
- [ ] 1 Day RUSH
- [ ] other

Emergency & Rush T/A data available via LabLink

Data Deliverable Information

- [ ] Commercial "A" (Level 1)
- [ ] Commercial "B" (Level 2)
- [ ] FULLT1 (Level 3+4)
- [ ] NJ Reduced
- [ ] Commercial "C"
- [ ] NJ Data of Known Quality Protocol Reporting
- [ ] NYASP Category A
- [ ] NYASP Category B
- [ ] State Forms
- [x] EDD Format EQUIS
- [ ] Other

Commercial "A" = Results Only; Commercial "B" = Results + QC Summary
NJ Reduced = Results + QC Summary + Partial Raw data

Comments / Special Instructions

INITIAL ASESSMENT A3A

LABEL VERIFICATION

Sample inventory is verified upon receipt in the Laboratory

Sample Custody must be documented below each time samples change possession, including courier delivery.

Relinquished by Sampler: 1	Date Time: 01/21/19 1430	Received By: 1	Relinquished By: 2	Date Time: 1.21.19 1625	Received By: 2
Relinquished by Sampler: 3	Date Time:	Received By: 3	Relinquished By: 4	Date Time:	Received By: 4
Relinquished by: 5	Date Time:	Received By: 5	Custody Seal # 9038	Intact / Not intact	Preserved where applicable

On Ice: X Cooler Temp: 05.0 °C

Form:SM088-03C (revised 2/12/18)

http://www.sgs.com/en/terms-and-conditions.

5.2 5

JC81644: Chain of Custody
Page 1 of 4

Report of Analysis

Client Sample ID:	FB(20190121)-A1		
Lab Sample ID:	JC81644-1	**Date Sampled:**	01/21/19
Matrix:	AQ - Field Blank Soil	**Date Received:**	01/21/19
		Percent Solids:	n/a
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	< 0.010	0.010	mg/l	1	01/21/19 17:08	JO	SW846 7196A
Redox Potential Vs H2	287		mv	1	01/22/19 13:15	RI	ASTM D1498-76
pH [a]	6.42		su	1	01/21/19 16:38	FR	SM4500H+ B-11

(a) Sample received out of holding time for pH analysis.

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-A14		
Lab Sample ID:	JC81644-3	**Date Sampled:**	01/21/19
Matrix:	SO - Soil	**Date Received:**	01/21/19
		Percent Solids:	84.1
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	< 0.48	0.48	mg/kg	1	01/22/19 16:44	RI	SW846 3060A/7196A
Redox Potential Vs H2	290		mv	1	01/22/19 13:44	RI	ASTM D1498-76M
Solids, Percent	84.1		%	1	01/22/19 08:45	EB	SM2540 G 18TH ED MOD
pH	7.40		su	1	01/22/19 13:34	RI	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID: 107-M028E2
Lab Sample ID: JC81644-4
Matrix: SO - Soil
Project: PPG Site 107, 18 Chapel Avenue, Jersey City, NJ

Date Sampled: 01/21/19
Date Received: 01/21/19
Percent Solids: 88.6

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	0.54	0.45	mg/kg	1	01/22/19 16:44	RI	SW846 3060A/7196A
Redox Potential Vs H2	300		mv	1	01/22/19 13:34	RI	ASTM D1498-76M
Solids, Percent	88.6		%	1	01/22/19 08:45	EB	SM2540 G 18TH ED MOD
pH	7.67		su	1	01/22/19 13:28	RI	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID: FB(20190121)-A1
Lab Sample ID: JC81644-1A
Matrix: AQ - Field Blank Soil
Project: PPG Site 107, 18 Chapel Avenue, Jersey City, NJ

Date Sampled: 01/21/19
Date Received: 01/21/19
Percent Solids: n/a

Total Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 6.0	6.0	ug/l	1	01/21/19	01/22/19	GT	SW846 6010D [1]	SW846 3010A [2]
Chromium	< 10	10	ug/l	1	01/21/19	01/22/19	GT	SW846 6010D [1]	SW846 3010A [2]
Nickel	< 10	10	ug/l	1	01/21/19	01/22/19	GT	SW846 6010D [1]	SW846 3010A [2]
Thallium	< 10	10	ug/l	1	01/21/19	01/22/19	GT	SW846 6010D [1]	SW846 3010A [2]
Vanadium	< 50	50	ug/l	1	01/21/19	01/22/19	GT	SW846 6010D [1]	SW846 3010A [2]

(1) Instrument QC Batch: MA46022
(2) Prep QC Batch: MP12199

RL = Reporting Limit

Report of Analysis

Client Sample ID:	FB(20190121)-A1		
Lab Sample ID:	JC81644-1A	**Date Sampled:**	01/21/19
Matrix:	AQ - Field Blank Soil	**Date Received:**	01/21/19
		Percent Solids:	n/a
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	< 0.020	0.020	mg/l	1	01/22/19 12:39	GT	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-A14		
Lab Sample ID:	JC81644-3A	**Date Sampled:**	01/21/19
Matrix:	SO - Soil	**Date Received:**	01/21/19
		Percent Solids:	84.1
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 2.5	2.5	mg/kg	1	01/21/19	01/22/19	GT	SW846 6010D [1]	SW846 3050B [2]
Chromium	14.3	1.2	mg/kg	1	01/21/19	01/22/19	GT	SW846 6010D [1]	SW846 3050B [2]
Nickel	11.4	5.0	mg/kg	1	01/21/19	01/22/19	GT	SW846 6010D [1]	SW846 3050B [2]
Thallium	< 1.2	1.2	mg/kg	1	01/21/19	01/22/19	GT	SW846 6010D [1]	SW846 3050B [2]
Vanadium	20.8	6.2	mg/kg	1	01/21/19	01/22/19	GT	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA46022
(2) Prep QC Batch: MP12179

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-A14		
Lab Sample ID:	JC81644-3A	**Date Sampled:**	01/21/19
Matrix:	SO - Soil	**Date Received:**	01/21/19
		Percent Solids:	84.1
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	13.9	1.7	mg/kg	1	01/22/19 16:44	RI	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID: 107-M028E2
Lab Sample ID: JC81644-4A
Matrix: SO - Soil
Project: PPG Site 107, 18 Chapel Avenue, Jersey City, NJ

Date Sampled: 01/21/19
Date Received: 01/21/19
Percent Solids: 88.6

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 2.3	2.3	mg/kg	1	01/21/19	01/22/19	GT	SW846 6010D [1]	SW846 3050B [2]
Chromium	16.6	1.1	mg/kg	1	01/21/19	01/22/19	GT	SW846 6010D [1]	SW846 3050B [2]
Nickel	14.6	4.6	mg/kg	1	01/21/19	01/22/19	GT	SW846 6010D [1]	SW846 3050B [2]
Thallium	< 1.1	1.1	mg/kg	1	01/21/19	01/22/19	GT	SW846 6010D [1]	SW846 3050B [2]
Vanadium	24.5	5.7	mg/kg	1	01/21/19	01/22/19	GT	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA46022
(2) Prep QC Batch: MP12179

RL = Reporting Limit

Report of Analysis

Client Sample ID:	107-M028E2		
Lab Sample ID:	JC81644-4A	**Date Sampled:**	01/21/19
Matrix:	SO - Soil	**Date Received:**	01/21/19
		Percent Solids:	88.6
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	16.1	1.6	mg/kg	1	01/22/19 16:44	RI	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

SGS

SO FB

CHAIN OF CUSTODY

SGS North America Inc. - Dayton
2235 Route 130, Dayton, NJ 08810
TEL. 732-329-0200 FAX 732-329-3499
www.sgs.com/ehsusa

PAGE 1 OF 1

FED-EX Tracking #:
Bottle Order Control #: AH-121018-211
SGS Quote #:
SGS Job #: JC81681

Client / Reporting Information

Company Name: Arcadis
Street Address: 10 Friends Lane Suite 200
City: Newtown State: PA Zip: 18440
Project Contact: Matt Bell E-mail:
Phone #: 646.762.5629 Fax #:
Sampler(s) Name(s): Cynthia Buchanan, Charlton Cifelli Phone #:

Project Information

Project Name: PPG Site 107 Jersey City
Street: 18 Chapel Avenue
City: Jersey City State: NJ
Project #: NP000770.0001.00008
Client Purchase Order #:
Project Manager: Jim McLaughlin

Billing Information (if different from Report to)
Company Name:
Street Address:
City: State: Zip:
Attention:

Requested Analysis (see TEST CODE sheet): Total Chromium, Hexavalent Chromium, Trivalent Chromium, Antimony, Nickel, Thallium, Vanadium

Matrix Codes: DW - Drinking Water; GW - Ground Water; WW - Water; SW - Surface Water; SO - Soil; SL - Sludge; SED-Sediment; OI - Oil; LIQ - Other Liquid; AIR - Air; SOL - Other Solid; WP - Wipe; FB-Field Blank; EB-Equipment Blank; RB- Rinse Blank; TB-Trip Blank

Lab Sample #	Field ID / Point of Collection	MEOH/DI Vial #	Date	Time	Sampled by	Matrix	# of bottles	HCl	NaOH	HNO3	H2SO4	NONE	DI Water	MEOH	ENCORE	Total Chromium	Hexavalent Chromium	Trivalent Chromium	Antimony	Nickel	Thallium	Vanadium	LAB USE ONLY
1	FB(20190122)		1/22/19	1230	CC	FB	2			1		1				X	X	X	X	X	X	X	D63
2	107-M028W		1/22/19	1130	CB	SO	1					1				X	X	X	X	X	X	X	A18
3	BS-A15		1/22/19	1155	CB	SO	1					1				X	X	X	X	X	X	X	G3
	BS-A15MS		1/22/19	1155	CB	SO	1					1				X	X	X	X	X	X	X	
	BS-A15MSD		1/22/19	1155	CB	SO	1					1				X	X	X	X	X	X	X	
4	107-M030E2		1/22/19	1200	CB	SO	1					1				X	X	X	X	X	X	X	
5	BS-A16S		1/22/19	1205	CB	SO	1					1				X	X	X	X	X	X	X	
6	DUP02(20190122)RR		1/22/19	—	CB	SO	1					1				X	X	X	X	X	X	X	
7	BS-A16I		1/22/19	1245	CB	SO	1					1				X	X	X	X	X	X	X	

Turnaround Time (Business days)

- [ ] Std. 10 Business Days
- [ ] 5 Day RUSH
- [ ] 3 Day RUSH
- [x] 2 Day RUSH
- [ ] 1 Day RUSH
- [ ] other

Approved by (SGS Project Manager)/Date:

Emergency & Rush T/A data available via LabLink

Data Deliverable Information

- [ ] Commercial "A" (Level 1)
- [ ] Commercial "B" (Level 2)
- [ ] FULLT1 (Level 3+4)
- [ ] NJ Reduced
- [ ] Commercial "C"
- [ ] NJ Data of Known Quality Protocol Reporting
- [ ] NYASP Category A
- [ ] NYASP Category B
- [ ] State Forms
- [x] EDD Format Equis
- [ ] Other

Commercial "A" = Results Only; Commercial "B" = Results + QC Summary
NJ Reduced = Results + QC Summary + Partial Raw data

Comments / Special Instructions

INITIAL ASSESSMENT FL 3B

LABEL VERIFICATION

Sample inventory is verified upon receipt in the Laboratory

Sample Custody must be documented below each time samples change possession, including courier delivery.

Relinquished by Sampler: 1 [signature]	Date Time: 1/22/19 1412	Received By: 1 Robert Chambers	Relinquished By: 2 Robert Chambers	Date Time: 1-22-19 1557	Received By: 2 [signature]
Relinquished by Sampler: 3	Date Time:	Received By: 3	Relinquished By: 4	Date Time:	Received By: 4
Relinquished by: 5	Date Time:	Received By: 5	Custody Seal # 19706	☐ Intact ☐ Not intact	Preserved where applicable ☐	On Ice ☒	Cooler Temp. 1.6 3.2 °C

Form:SM088-03C (revised 2/12/18)

http://www.sgs.com/en/terms-and-conditions.

5.2

5

JC81681: Chain of Custody
Page 1 of 4

Report of Analysis

Client Sample ID:	FB(20190122)		
Lab Sample ID:	JC81681-1	**Date Sampled:**	01/22/19
Matrix:	AQ - Field Blank Soil	**Date Received:**	01/22/19
		Percent Solids:	n/a
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	< 0.010	0.010	mg/l	1	01/22/19 20:55	LS	SW846 7196A
Redox Potential Vs H2	266		mv	1	01/23/19 14:50	RB	ASTM D1498-76
pH [a]	5.33		su	1	01/22/19 15:40	SUB	SM4500H+ B-11

(a) Sample received out of holding time for pH analysis.

RL = Reporting Limit

Report of Analysis

Client Sample ID:	107-M028W		
Lab Sample ID:	JC81681-2	**Date Sampled:**	01/22/19
Matrix:	SO - Soil	**Date Received:**	01/22/19
		Percent Solids:	80.8
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	< 0.50 UJ-	0.50	mg/kg	1	01/23/19 15:10	DC	SW846 3060A/7196A
Redox Potential Vs H2	263		mv	1	01/23/19 16:09	RB	ASTM D1498-76M
Solids, Percent	80.8		%	1	01/23/19 08:40	EB	SM2540 G 18TH ED MOD
pH	7.07		su	1	01/23/19 15:33	RB	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-A15		
Lab Sample ID:	JC81681-3	**Date Sampled:**	01/22/19
Matrix:	SO - Soil	**Date Received:**	01/22/19
		Percent Solids:	84.5
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	< 0.47 UJ-	0.47	mg/kg	1	01/23/19 15:05	DC	SW846 3060A/7196A
Redox Potential Vs H2	258		mv	1	01/23/19 16:19	RB	ASTM D1498-76M
Solids, Percent	84.5		%	1	01/23/19 08:40	EB	SM2540 G 18TH ED MOD
pH	7.36		su	1	01/23/19 15:35	RB	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID:	107-M030E2		
Lab Sample ID:	JC81681-4	**Date Sampled:**	01/22/19
Matrix:	SO - Soil	**Date Received:**	01/22/19
		Percent Solids:	75.3
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	1.0 J-	0.53	mg/kg	1	01/23/19 15:10	DC	SW846 3060A/7196A
Redox Potential Vs H2	256		mv	1	01/23/19 16:25	RB	ASTM D1498-76M
Solids, Percent	75.3		%	1	01/23/19 08:40	EB	SM2540 G 18TH ED MOD
pH	7.18		su	1	01/23/19 16:09	RB	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-A16S		
Lab Sample ID:	JC81681-5	**Date Sampled:**	01/22/19
Matrix:	SO - Soil	**Date Received:**	01/22/19
		Percent Solids:	77.9
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	< 0.51 UJ-	0.51	mg/kg	1	01/23/19 15:10	DC	SW846 3060A/7196A
Redox Potential Vs H2	256		mv	1	01/23/19 16:30	RB	ASTM D1498-76M
Solids, Percent	77.9		%	1	01/23/19 08:40	EB	SM2540 G 18TH ED MOD
pH	7.11		su	1	01/23/19 16:15	RB	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID:	DUP-02(20190122)RR		
Lab Sample ID:	JC81681-6	**Date Sampled:**	01/22/19
Matrix:	SO - Soil	**Date Received:**	01/22/19
		Percent Solids:	81.8
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	< 0.49 UJ-	0.49	mg/kg	1	01/23/19 15:10	DC	SW846 3060A/7196A
Redox Potential Vs H2	255		mv	1	01/23/19 16:31	RB	ASTM D1498-76M
Solids, Percent	81.8		%	1	01/23/19 08:40	EB	SM2540 G 18TH ED MOD
pH	6.93		su	1	01/23/19 16:26	RB	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-A16I		
Lab Sample ID:	JC81681-7	**Date Sampled:**	01/22/19
Matrix:	SO - Soil	**Date Received:**	01/22/19
		Percent Solids:	86.0
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	0.99 J-	0.47	mg/kg	1	01/23/19 15:10	DC	SW846 3060A/7196A
Redox Potential Vs H2	254		mv	1	01/23/19 16:41	RB	ASTM D1498-76M
Solids, Percent	86		%	1	01/23/19 08:40	EB	SM2540 G 18TH ED MOD
pH	7.45		su	1	01/23/19 16:30	RB	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID:	107-M028W		
Lab Sample ID:	JC81681-2R	**Date Sampled:**	01/22/19
Matrix:	SO - Soil	**Date Received:**	01/22/19
		Percent Solids:	80.8
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	0.70	0.50	mg/kg	1	01/25/19 17:35	DC	SW846 3060A/7196A

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-A15		
Lab Sample ID:	JC81681-3R	**Date Sampled:**	01/22/19
Matrix:	SO - Soil	**Date Received:**	01/22/19
		Percent Solids:	84.5
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	< 0.47	0.47	mg/kg	1	01/25/19 17:30	DC	SW846 3060A/7196A

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-A15		
Lab Sample ID:	JC81681-3RT	**Date Sampled:**	01/22/19
Matrix:	SO - Soil	**Date Received:**	01/22/19
		Percent Solids:	84.5
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Iron, Ferrous	0.76 J	0.20	%	1	01/29/19 11:30	ST	ASTM D3872-86
Sulfide Screen	NEGATIVE			1	01/29/19	ST	SM4500S2- A-11
Total Organic Carbon	1730	120	mg/kg	1	01/28/19 20:54	CD	LLOYD KAHN 1988 MOD

RL = Reporting Limit

Report of Analysis

Client Sample ID:	107-M030E2		
Lab Sample ID:	JC81681-4R	**Date Sampled:**	01/22/19
Matrix:	SO - Soil	**Date Received:**	01/22/19
		Percent Solids:	75.3
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	0.56	0.53	mg/kg	1	01/25/19 17:35	DC	SW846 3060A/7196A

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-A16S		
Lab Sample ID:	JC81681-5R	**Date Sampled:**	01/22/19
Matrix:	SO - Soil	**Date Received:**	01/22/19
		Percent Solids:	77.9
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	0.76	0.51	mg/kg	1	01/25/19 17:35	DC	SW846 3060A/7196A

RL = Reporting Limit

Report of Analysis

Client Sample ID:	DUP-02(20190122)RR		
Lab Sample ID:	JC81681-6R	**Date Sampled:**	01/22/19
Matrix:	SO - Soil	**Date Received:**	01/22/19
		Percent Solids:	81.8
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	0.63	0.49	mg/kg	1	01/25/19 17:35	DC	SW846 3060A/7196A

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-A16I		
Lab Sample ID:	JC81681-7R	**Date Sampled:**	01/22/19
Matrix:	SO - Soil	**Date Received:**	01/22/19
		Percent Solids:	86.0
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	< 0.47	0.47	mg/kg	1	01/25/19 17:35	DC	SW846 3060A/7196A

RL = Reporting Limit

Report of Analysis

Client Sample ID: FB(20190122)
Lab Sample ID: JC81681-1A
Matrix: AQ - Field Blank Soil
Project: PPG Site 107, 18 Chapel Avenue, Jersey City, NJ

Date Sampled: 01/22/19
Date Received: 01/22/19
Percent Solids: n/a

Total Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 6.0	6.0	ug/l	1	01/23/19	01/23/19	ND	SW846 6010D [1]	SW846 3010A [2]
Chromium	< 10	10	ug/l	1	01/23/19	01/23/19	ND	SW846 6010D [1]	SW846 3010A [2]
Nickel	< 10	10	ug/l	1	01/23/19	01/23/19	ND	SW846 6010D [1]	SW846 3010A [2]
Thallium	< 10	10	ug/l	1	01/23/19	01/23/19	ND	SW846 6010D [1]	SW846 3010A [2]
Vanadium	< 50	50	ug/l	1	01/23/19	01/23/19	ND	SW846 6010D [1]	SW846 3010A [2]

(1) Instrument QC Batch: MA46026
(2) Prep QC Batch: MP12223

RL = Reporting Limit

Report of Analysis

Client Sample ID:	FB(20190122)		
Lab Sample ID:	JC81681-1A	**Date Sampled:**	01/22/19
Matrix:	AQ - Field Blank Soil	**Date Received:**	01/22/19
		Percent Solids:	n/a
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	< 0.020	0.020	mg/l	1	01/23/19 16:16	ND	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	107-M028W		
Lab Sample ID:	JC81681-2A	**Date Sampled:**	01/22/19
Matrix:	SO - Soil	**Date Received:**	01/22/19
		Percent Solids:	80.8
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 2.5 UJ-	2.5	mg/kg	1	01/22/19	01/23/19	ND	SW846 6010D [1]	SW846 3050B [2]
Chromium	18.1	1.3	mg/kg	1	01/22/19	01/23/19	ND	SW846 6010D [1]	SW846 3050B [2]
Nickel	11.2	5.1	mg/kg	1	01/22/19	01/23/19	ND	SW846 6010D [1]	SW846 3050B [2]
Thallium	< 1.3	1.3	mg/kg	1	01/22/19	01/23/19	ND	SW846 6010D [1]	SW846 3050B [2]
Vanadium	28.2	6.3	mg/kg	1	01/22/19	01/23/19	ND	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA46027
(2) Prep QC Batch: MP12220

RL = Reporting Limit

Report of Analysis

Client Sample ID:	107-M028W		
Lab Sample ID:	JC81681-2A	**Date Sampled:**	01/22/19
Matrix:	SO - Soil	**Date Received:**	01/22/19
		Percent Solids:	80.8
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	17.7	1.8	mg/kg	1	01/23/19 22:25	ND	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-A15		
Lab Sample ID:	JC81681-3A	**Date Sampled:**	01/22/19
Matrix:	SO - Soil	**Date Received:**	01/22/19
		Percent Solids:	84.5
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 2.4 UJ-	2.4	mg/kg	1	01/22/19	01/23/19	ND	SW846 6010D [1]	SW846 3050B [2]
Chromium	15.9	1.2	mg/kg	1	01/22/19	01/23/19	ND	SW846 6010D [1]	SW846 3050B [2]
Nickel	12.9	4.8	mg/kg	1	01/22/19	01/23/19	ND	SW846 6010D [1]	SW846 3050B [2]
Thallium	< 1.2	1.2	mg/kg	1	01/22/19	01/23/19	ND	SW846 6010D [1]	SW846 3050B [2]
Vanadium	25.9	6.0	mg/kg	1	01/22/19	01/23/19	ND	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA46027
(2) Prep QC Batch: MP12220

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-A15		
Lab Sample ID:	JC81681-3A	**Date Sampled:**	01/22/19
Matrix:	SO - Soil	**Date Received:**	01/22/19
		Percent Solids:	84.5
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	15.5	1.7	mg/kg	1	01/23/19 21:16	ND	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	107-M030E2		
Lab Sample ID:	JC81681-4A	**Date Sampled:**	01/22/19
Matrix:	SO - Soil	**Date Received:**	01/22/19
		Percent Solids:	75.3
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 2.8 UJ-	2.8	mg/kg	1	01/22/19	01/23/19	ND	SW846 6010D [1]	SW846 3050B [2]
Chromium	19.0	1.4	mg/kg	1	01/22/19	01/23/19	ND	SW846 6010D [1]	SW846 3050B [2]
Nickel	14.0	5.5	mg/kg	1	01/22/19	01/23/19	ND	SW846 6010D [1]	SW846 3050B [2]
Thallium	< 1.4	1.4	mg/kg	1	01/22/19	01/23/19	ND	SW846 6010D [1]	SW846 3050B [2]
Vanadium	29.4	6.9	mg/kg	1	01/22/19	01/23/19	ND	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA46027
(2) Prep QC Batch: MP12220

RL = Reporting Limit

Report of Analysis

Client Sample ID:	107-M030E2		
Lab Sample ID:	JC81681-4A	**Date Sampled:**	01/22/19
Matrix:	SO - Soil	**Date Received:**	01/22/19
		Percent Solids:	75.3
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	18.0	1.9	mg/kg	1	01/23/19 22:31	ND	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-A16S		
Lab Sample ID:	JC81681-5A	**Date Sampled:**	01/22/19
Matrix:	SO - Soil	**Date Received:**	01/22/19
		Percent Solids:	77.9
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 2.4 UJ-	2.4	mg/kg	1	01/22/19	01/23/19	ND	SW846 6010D [1]	SW846 3050B [2]
Chromium	12.7	1.2	mg/kg	1	01/22/19	01/23/19	ND	SW846 6010D [1]	SW846 3050B [2]
Nickel	11.6	4.9	mg/kg	1	01/22/19	01/23/19	ND	SW846 6010D [1]	SW846 3050B [2]
Thallium	< 1.2	1.2	mg/kg	1	01/22/19	01/23/19	ND	SW846 6010D [1]	SW846 3050B [2]
Vanadium	18.6	6.1	mg/kg	1	01/22/19	01/23/19	ND	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA46027
(2) Prep QC Batch: MP12220

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-A16S		
Lab Sample ID:	JC81681-5A	**Date Sampled:**	01/22/19
Matrix:	SO - Soil	**Date Received:**	01/22/19
		Percent Solids:	77.9
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	12.3	1.7	mg/kg	1	01/23/19 22:46	ND	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	DUP-02(20190122)RR		
Lab Sample ID:	JC81681-6A	**Date Sampled:**	01/22/19
Matrix:	SO - Soil	**Date Received:**	01/22/19
		Percent Solids:	81.8
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 2.4 UJ-	2.4	mg/kg	1	01/22/19	01/23/19	ND	SW846 6010D [1]	SW846 3050B [2]
Chromium	19.6	1.2	mg/kg	1	01/22/19	01/23/19	ND	SW846 6010D [1]	SW846 3050B [2]
Nickel	11.6	4.8	mg/kg	1	01/22/19	01/23/19	ND	SW846 6010D [1]	SW846 3050B [2]
Thallium [a]	< 2.4	2.4	mg/kg	2	01/22/19	01/23/19	ND	SW846 6010D [1]	SW846 3050B [2]
Vanadium	35.5	6.0	mg/kg	1	01/22/19	01/23/19	ND	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA46027
(2) Prep QC Batch: MP12220

(a) Elevated detection limit due to dilution required for high interfering element.

RL = Reporting Limit

Report of Analysis

Client Sample ID:	DUP-02(20190122)RR		
Lab Sample ID:	JC81681-6A	**Date Sampled:**	01/22/19
Matrix:	SO - Soil	**Date Received:**	01/22/19
		Percent Solids:	81.8
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	19.1	1.7	mg/kg	1	01/23/19 22:52	ND	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-A16I		
Lab Sample ID:	JC81681-7A	**Date Sampled:**	01/22/19
Matrix:	SO - Soil	**Date Received:**	01/22/19
		Percent Solids:	86.0
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 2.3 UJ-	2.3	mg/kg	1	01/22/19	01/23/19	ND	SW846 6010D [1]	SW846 3050B [2]
Chromium	13.3	1.2	mg/kg	1	01/22/19	01/23/19	ND	SW846 6010D [1]	SW846 3050B [2]
Nickel	11.7	4.7	mg/kg	1	01/22/19	01/23/19	ND	SW846 6010D [1]	SW846 3050B [2]
Thallium	< 1.2	1.2	mg/kg	1	01/22/19	01/23/19	ND	SW846 6010D [1]	SW846 3050B [2]
Vanadium	20.1	5.8	mg/kg	1	01/22/19	01/23/19	ND	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA46027
(2) Prep QC Batch: MP12220

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-A16I		
Lab Sample ID:	JC81681-7A	**Date Sampled:**	01/22/19
Matrix:	SO - Soil	**Date Received:**	01/22/19
		Percent Solids:	86.0
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	12.3	1.7	mg/kg	1	01/23/19 22:57	ND	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

ARCADIS Design & Consultancy for natural and built assets

PPG Industries

DATA QUALITY ASSESSMENT

Site 107 Fashionland

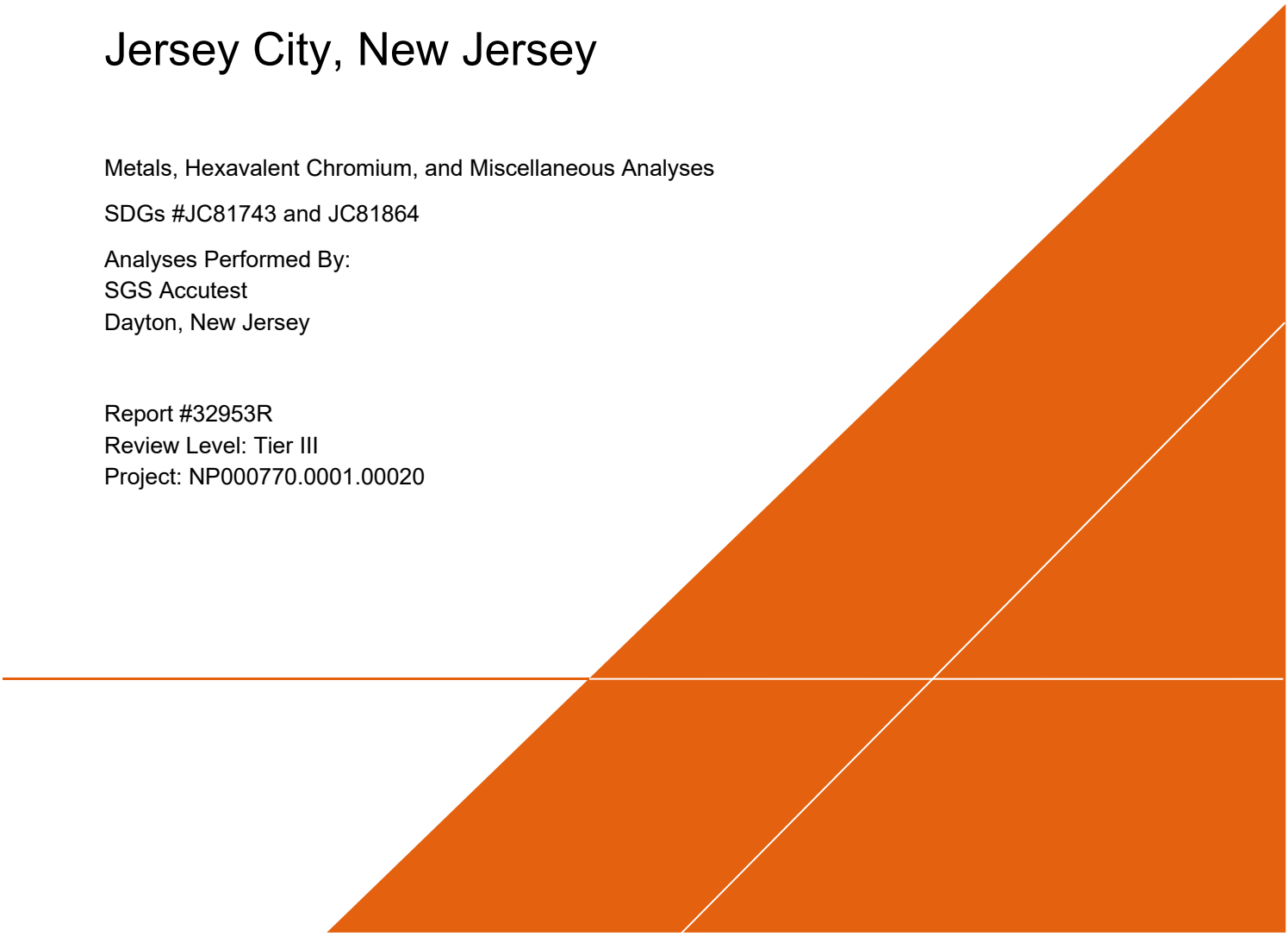
Jersey City, New Jersey

Metals, Hexavalent Chromium, and Miscellaneous Analyses

SDGs #JC81743 and JC81864

Analyses Performed By:
SGS Accutest
Dayton, New Jersey

Report #32953R
Review Level: Tier III
Project: NP000770.0001.00020



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Groups (SDGs) # JC81743 and JC81864 for samples collected in association with the PPG Industries Site 107 Fashionland, Jersey City, New Jersey Site. The review was conducted as a Tier III evaluation and included review of data package completeness. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

SDG	Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis		
						Cr VI	MET	MISC
JC81743	FB(20190123)	JC81743-1	Water	1/23/2019		X	X	X
	SW-A0 (8.0-8.5)	JC81743-2	Soil	1/23/2019		X	X	X
	BS-A0T	JC81743-3	Soil	1/23/2019		X	X	X
	BS-A1T	JC81743-4	Soil	1/23/2019		X	X	X
	BS-A2T	JC81743-5	Soil	1/23/2019		X	X	X
	BS-A1	JC81743-6	Soil	1/23/2019		X	X	X
	BS-A2	JC81743-7	Soil	1/23/2019		X	X	X
	SW-A11 (8.0-8.5)	JC81743-8	Soil	1/23/2019		X	X	X
	SW-A10 (8.0-8.5)	JC81743-9	Soil	1/23/2019		X	X	X
	SW-A11 (6.0-6.5)	JC81743-10	Soil	1/23/2019		X	X	X
	SW-A10 (6.0-6.5)	JC81742-11	Soil	1/23/2019		X	X	X
	BS-A3D	JC81743-12	Soil	1/23/2019		X	X	X
	BS-A3S	JC81743-13	Soil	1/23/2019		X	X	X
	BS-A3T	JC81743-14	Soil	1/23/2019		X	X	X
JC81864	FB(20190125)	JC81864-1	Water	1/25/2019		X	X	X
	BS-A18	JC81864-2	Soil	1/25/2019		X	X	X
	BS-A19	JC81864-3	Soil	1/25/2019		X	X	X
	BS-A17	JC81864-4	Soil	1/25/2019		X	X	X
	108_M016_1	JC81864-5	Soil	1/25/2019		X	X	X
	107_M034N	JC81864-6	Soil	1/25/2019		X	X	X
	108_M018N_1	JC81864-7	Soil	1/25/2019		X	X	X
	108_M018N	JC81864-8	Soil	1/25/2019		X	X	X

Notes:

1. Metals include antimony, chromium, nickel, thallium, and vanadium. Trivalent chromium is reported by calculation (Chromium) – (Hexavalent Chromium).

2. Cr VI is hexavalent chromium.
3. Miscellaneous parameters include pH and redox potential.

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of QA or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

Note:
QA - Quality Assurance

INORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Methods 6010C, 7196A, and 9045D; Standard Method (SM) 4500H+B; and ASTM D1498-76. Data were reviewed in accordance with USEPA Region 2 SOP HW-2b, Revision 15 (December 2012); New Jersey Division of Remediation Management and Response Standard Operating Procedure for Analytical Data Validation of Hexavalent Chromium (September 2009); New Jersey Department of Environmental Protection Data Quality Assessment and Data Usability Evaluation Technical Guidance (April 2014); Field Sampling Plan/Quality Assurance Project Plan, PPG Non-Residential and Residential Chromium Sites, Hudson County, New Jersey (AECOM, June 2010); and Arcadis Quality Assurance Project Plan – Addendum, Site 107 Fashionland, Jersey City, New Jersey (Arcadis, June 2018).

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and that it was already subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with the USEPA National Functional Guidelines:

- Concentration (C) Qualifiers
  - U The analyte was analyzed for but not detected. The associated value is the analyte instrument detection limit.
  - B The reported value was obtained from a reading less than the reporting limit (RL), but greater than or equal to the method detection limit (MDL).
- Quantitation (Q) Qualifiers
  - E The reported value is estimated due to the presence of interference.
  - N Spiked sample recovery is not within control limits.
  - * Duplicate analysis is not within control limits.
- Validation Qualifiers
  - J The analyte was positively identified; however, the associated numerical value is an estimated concentration only.
  - J+ The result is an estimated quantity, but the result may be biased high.
  - J- The result is an estimated quantity, but the result may be biased low.
  - UJ The analyte was not detected above the reporting limit. However, the reported limit is approximate and may or may not represent the actual limit of detection.
  - UB Analyte considered non-detect at the listed value due to associated blank contamination.
  - R The data are unusable. The sample results are rejected due to serious deficiencies in meeting Quality Control (QC) critieria. The analyte may or may not be present in the sample.

Two facts should be noted by all data users. First, the “R” flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. “R” values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

METALS ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 6010C	Water	180 days from collection to analysis	Preserved to a pH of less than 2; Cool to <6°C
	Soil	180 days from collection to analysis	Cool to <6°C

All samples were analyzed within the specified holding times.

2. Blank Contamination

Quality assurance (QA) blanks (i.e., method and rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank is calculated for QA blanks containing concentrations greater than the method detection limit (MDL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Analytes were not detected above the MDL in the associated blanks; therefore, detected sample results were not associated with blank contamination.

3. Calibration

Satisfactory instrument calibration is established to provide that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument's continuing performance is satisfactory.

3.1 Initial Calibration and Continuing Calibration

The correct number and type of standards were analyzed. The correlation coefficient of the initial calibration was greater than 0.998 and all initial calibration verification standard and continuing calibration verification standard recoveries were within control limits of 90% to 110%.

All continuing calibration verification standard recoveries were within the control limit.

3.2 Low-Level Calibration Verification

The low-level initial and continuing calibration check standard serves to verify the linearity of calibration of the analysis at the reporting limit.

All RL standard recoveries were within control limits of 70% to 130% (50% to 150% for antimony and thallium).

3.3 ICP Interference Control Sample (ICS)

The ICS verifies the laboratories interelement and background correction factors.

All ICS exhibited recoveries within the control limits of 80% to 120%.

4. Matrix Spike/Matrix Spike Duplicate (MS/MSD)/Laboratory Duplicate Analysis

MS/MSD and laboratory duplicate data are used to assess the precision and accuracy of the analytical method.

4.1 MS/MSD Analysis

All metal analytes must exhibit a percent recovery within the established acceptance limits of 75% to 125%. The MS/MSD recovery control limits do not apply for MS/MSD performed on sample locations where the analyte's concentration detected in the parent sample exceeds the MS/MSD concentration by a factor of four or greater.

The MS/MSD analysis performed on sample locations BS-A3T and BS-A18 exhibited recoveries within the control limits with the exception of the analytes presented in the table below.

Sample Location	Analyte	MS Recovery	MSD Recovery
BS-A3T	Antimony	59.6%	64.1%
BS-A18	Antimony	70.4%	73.5%

The criteria used to evaluate MS/MSD recoveries are presented in the following table. In the case of an MS/MSD deviation, the sample results are qualified. The qualifications are applied to all sample results associated with the sample preparation batch.

Control limit	Sample Result	Qualification
MS/MSD percent recovery 30% to 74%	Non-detect	UJ-
	Detect	J-
MS/MSD percent recovery < 30%	Non-detect	R
	Detect	J-
MS/MSD percent recovery > 125%	Non-detect	No Action
	Detect	J+

4.2 Laboratory Duplicate Analysis

The laboratory duplicate relative percent difference (RPD) criterion is applied when parent and duplicate sample concentrations are greater than or equal to 5 times the RL. A control limit of 20% for water matrices and 35% for soil matrices is applied when the criteria above is true. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of ± the RL is applied.

MS/MSD analysis was performed in replacement of the laboratory duplicate analysis using samples BS-A3T and BS-A18. The MS/MSD recoveries exhibited acceptable RPDs.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 50% for soil matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of three times the RL is applied for soil matrices.

Field duplicate samples were not collected in association with these SDGs.

6. Laboratory Control Sample (LCS) Analysis

The LCS analysis is used to assess the accuracy of the analytical method independent of matrix interferences. The analytes associated with the LCS analysis must exhibit a percent recovery between the control limits of 80% and 120%.

The LCS analysis exhibited recoveries and RPDs within the control limits.

7. Serial Dilution

The serial dilution analysis is used to assess if a significant physical or chemical interference exists due to sample matrix. Analytes exhibiting concentrations greater than 10 times the RL in the undiluted sample are evaluated to determine if matrix interference exists. These analytes are required to have less than a 10% difference (%D) between sample results from the undiluted (parent) sample and results associated with the same sample analyzed with a five-fold dilution.

The serial dilution performed on sample locations BS-A3T and BS-A18 exhibited %D within the control limit.

8. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR METALS

METALS: SW-846 6010C	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Inductively Coupled Plasma-Atomic Emission Spectrometry (ICP-AES)					
Tier II Validation					
Holding Times		X		X	
Reporting limits (units)		X		X	
Blanks					
A. Instrument Blanks		X		X	
B. Method Blanks		X		X	
C. Equipment/Field Blanks		X		X	
Laboratory Control Sample (LCS)		X		X	
Laboratory Control Sample Duplicate (LCSD)	X				X
LCS/LCSD Precision (RPD)	X				X
Matrix Spike (MS) %R		X	X		
Matrix Spike Duplicate (MSD) %R		X	X		
MS/MSD Precision (RPD)		X		X	
Field/Lab Duplicate (RPD)		X		X	
ICP Serial Dilution %D		X		X	
Total vs. Dissolved	X				X
Reporting Limit Verification		X		X	
Tier III Validation					
Initial Calibration Verification		X		X	
Continuing Calibration Verification		X		X	
CRDL Standard Recovery		X		X	
ICP Interference Check		X		X	
ICP-MS Internal Standards	X				X
Transcription/calculations acceptable		X		X	
Raw Data	X				X
Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%R Percent recovery

RPD Relative percent difference

%D Percent difference

HEXAVALENT CHROMIUM ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 7196A	Water	24 hours from collection to analysis	Cool to <6°C
SW-846 3060A/ 7196A	Soil	30 days from collection to extraction; 7 days from extraction to analysis	Cool to <6°C

All samples were analyzed within the specified holding times.

2. Blank Contamination

Quality assurance (QA) blanks (i.e., method and rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank is calculated for QA blanks containing concentrations greater than the method detection limit (MDL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Analytes were not detected above the MDL in the associated blanks; therefore, detected sample results were not associated with blank contamination.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

The correct number and type of standards were analyzed. The correlation coefficient of the initial calibration was greater than 0.995 and all calibration verification standard recoveries were within control limits of 90% to 110%.

4. Matrix Spike (MS)/Post-Digestion Spike (PDS)/Laboratory Duplicate Analysis

MS, PDS, and laboratory duplicate data are used to assess the precision and accuracy of the analytical method.

4.1 MS Analysis

Soluble and insoluble spike sample analyses are designed to provide information about the effect of the sample matrix on the digestion and measurement methodology. The insoluble spike is used to evaluate the dissolution during the digestion process. Hexavalent chromium must exhibit a percent recovery within

the established acceptance limits of 75% to 125% in both the soluble and insoluble spiked analyses. The control limits do not apply when the parent sample concentration exceeds the spike amount by a factor of four or greater.

SDG #JC81743: The MS analysis performed on sample location BS-A3T in association with the insoluble and soluble hexavalent chromium analysis exhibited recoveries within the control limits.

SDG #JC81864: The MS analysis performed on sample location BS-A18 in association with the insoluble hexavalent chromium analysis exhibited recoveries within the control limits.

SDG #JC81864: The MS analysis performed on sample location BS-A18 exhibited spike recoveries less than the lower control limits as presented in the table below.

Sample Location	Analyte	Initial Spike Recovery	Reanalysis Spike Recovery
BS-A18	Hexavalent Chromium, Soluble	68.4%	AC (91.8%)

Notes:

AC = Acceptable

The criteria used to evaluate spike recoveries are presented in the following table. The qualifications are applied to all sample results associated with the sample preparation batch. In the event of a recovery outside of the control limits, the MS must be reanalyzed.

Control limit	Sample Result	Qualification[1]
Spike recovery ≥ 50% but < 75%	Non-detect	UJ-
	Detect	J-
Spike recovery < 50%	Non-detect	R
	Detect	R
Spike recovery > 125%	Non-detect	No Action
Spike recovery > 125% but ≤ 150%	Detect	J+
Spike recovery > 150%	Detect	R

Notes:

[1] If recoveries are < 50% or > 150% for both insoluble and soluble spikes, associated data will be rejected (“R”); otherwise qualify associated data if one of the spikes is outside the < 50% or > 150% limits.

SDG #JC81864: The reanalysis of the field sample is usable. No qualification of the sample results was required.

4.2 Post-Digestion Spike (PDS) Analysis

The PDS analysis is designed to verify that neither a reducing condition nor a chemical interference is affecting the analysis. This is accomplished by analyzing a second aliquot of the pH-adjusted filtrate that has been spiked with hexavalent chromium. The PDS must exhibit a percent recovery within the method acceptance limits of 85% to 115%.

The PDS analysis performed on sample locations BS-A3T and BS-A18 exhibited recoveries within the control limits.

4.3 Laboratory Duplicate Analysis

The laboratory duplicate relative percent difference (RPD) criterion is applied when parent and duplicate sample concentrations are greater than or equal to four times the RL. A control limit of 20% is applied when the criteria above is true. In the instance when the parent and/or duplicate sample concentrations are less than or equal to four times the RL, a control limit of ± the RL is used.

The laboratory duplicate analysis performed on sample locations BS-A3T and BS-A18 exhibited results within the control limit.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 50% for soil matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of three times the RL is applied for soil matrices.

Field duplicate samples were not collected in association with these SDGs.

6. Laboratory Control Sample (LCS) Analysis

The LCS analysis is used to assess the precision and accuracy of the analytical method independent of matrix interferences. The analytes associated with the LCS analysis must exhibit a percent recovery between the control limits of 80% and 120%.

The LCS analysis exhibited recoveries within the control limits.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR HEXAVALENT CHROMIUM

HEXAVALENT CHROMIUM: SW-846 7196A	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Spectrophotometer					
Tier II Validation					
Holding Times		X		X	
Reporting limits (units)		X		X	
Blanks					
A. Instrument Blanks		X		X	
B. Method Blanks		X		X	
C. Equipment/Field Blanks		X		X	
Laboratory Control Sample (LCS)		X		X	
Matrix Spike (MS) %R		X	X		
Matrix Spike Duplicate (MSD) %R	X				X
MS/MSD Precision (RPD)	X				X
Post Digestion Spike %R		X		X	
Field/Lab Duplicate (RPD)		X		X	
Dilution Factor		X		X	
Tier III Validation					
Initial calibration %RSD or correlation coefficient		X		X	
Continuing calibration %R		X		X	
Raw Data		X		X	
Transcription/calculation errors present		X		X	
Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%R Percent recovery

RPD Relative percent difference

%RSD Relative percent deviation

GENERAL CHEMISTRY ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
pH by SM4500H+B	Water	QAPP: 24 hours of receipt at laboratory	Cool to <6°C
pH by SW846 9045D	Soil	QAPP: 24 hours of receipt at laboratory	Cool to <6°C
Oxidation-Reduction Potential by ASTM D1498-76	Water	Not applicable	Cool to <6°C
Oxidation-Reduction Potential (Redox) by ASTM D1498-76	Soil	Measure immediately after creating leachate	Cool to <6°C

The analyses that exceeded the holding are presented in the following table.

Sample Locations	Method	Holding Time	Criteria
BS-A18 BS-A19 BS-A17 108_M016_1 107_M034N 108_M018N_1 108_M018N	SW846 9045D	Analysis: 2 days	< 24 hours of receipt by laboratory

Sample results were qualified as specified in the table below. All other holding times were met.

Criteria	Qualification	
	Detected Analytes	Non-detect Analytes
Analysis completed less than two times holding time	J	UJ
Analysis completed greater than two times holding time	J	R

2. Blank Contamination

Quality assurance (QA) blanks (i.e., method and rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank is calculated for QA blanks containing concentrations greater than the method detection limit (MDL). The

BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Method blank analysis is not applicable for Redox and pH analyses.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

The correct number and type of standards were analyzed. All buffer check results were within acceptance limits.

4. Laboratory Duplicate Analysis

Laboratory duplicate data are used to assess the precision of the analytical method. The laboratory duplicate relative percent difference (RPD) criterion is applied when parent and duplicate sample concentrations are greater than or equal to 5 times the RL. A control limit of 20% for water matrices and 35% for soil matrices is applied when the criteria above is true. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of ± the RL is applied.

The laboratory duplicate analysis performed on sample locations BS-A3T and BS-A18 exhibited results within the control limit.

4. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 50% for soil matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of three times the RL is applied for soil matrices.

Field duplicate samples were not collected in association with these SDGs.

6. Laboratory Control Sample (LCS) Analysis

The LCS analysis is used to assess the precision and accuracy of the analytical method independent of matrix interferences. The analytes associated with the LCS analysis must exhibit a percent recovery between the control limits of 80% and 120%.

LCS results for redox potential, pH, and sulfide screen were not reported in the analytical report.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR GENERAL CHEMISTRY

General Chemistry: SM4500H+B, SW846 9045D, ASTM D1498-76	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Miscellaneous Instrumentation					
Tier II Validation					
Holding times		X	X		
Reporting limits (units)		X		X	
Blanks					
A. Instrument Blanks	X				X
B. Method blanks	X				X
C. Equipment blanks	X				X
Laboratory Control Sample (LCS) %R	X				X
Laboratory Control Sample Duplicate (LCSD) %R	X				X
LCS/LCSD Precision (RPD)	X				X
Matrix Spike (MS) %R	X				X
Matrix Spike Duplicate (MSD) %R	X				X
MS/MSD Precision (RPD)	X				X
Field/Lab Duplicate (RPD)		X		X	
Dilution Factor		X		X	
Tier III Validation					
Initial calibration %RSD or correlation coefficient	X				X
Continuing calibration %R	X				X
Raw Data		X		X	
Transcription/calculation errors present		X		X	
Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%R Percent recovery

RPD Relative percent difference

VALIDATION PERFORMED BY: Jennifer Singer

SIGNATURE: 

DATE: June 5, 2019

PEER REVIEW: Dennis Capria

DATE: June 27, 2019

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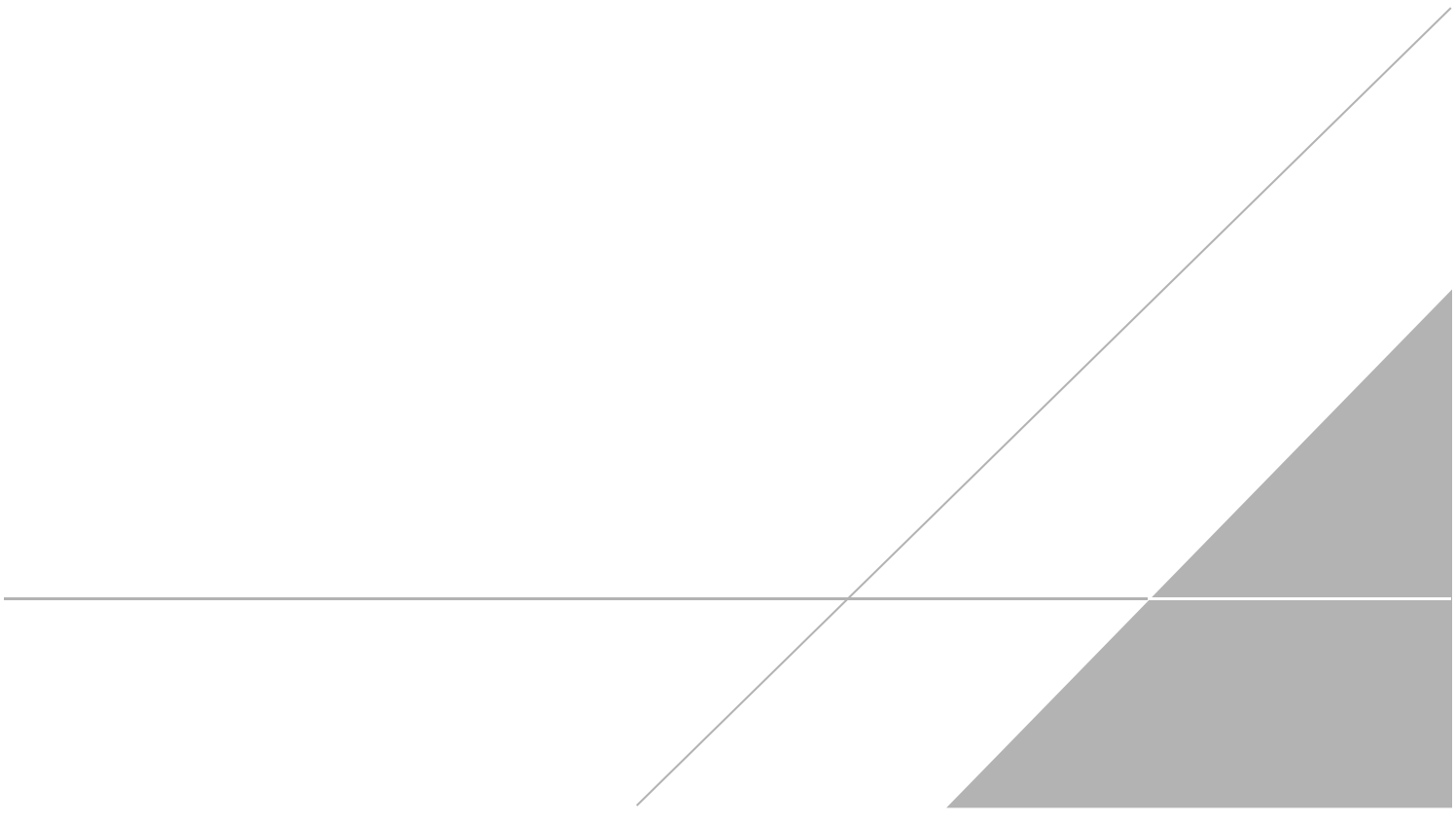
CORRECTED SAMPLE ANALYSIS DATA SHEETS



SO
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CHAIN OF CUSTODY

SGS North America Inc. - Dayton
2235 Route 130, Dayton, NJ 08810
TEL. 732-329-0200 FAX 732-329-3499
www.sgs.com/ehsusa

PAGE 1 OF 2

FED-EX Tracking #: | Bottle Order Control #:
SGS Quote #: | SGS Job #: JC81743

Client / Reporting Information

Company Name: Arcadis
Street Address: 10 Friends Lane Suite 200
City: Newtown State: PA Zip: 18940
Project Contact: Matt Bell E-mail:
Phone #: 646.762.5629 Fax #:
Sampler(s) Name(s): Christa Cifelli Phone #:

Project Information

Project Name: PPG Site 107 Jersey City
Street: 18 Chapel Ave.
City: Jersey City State: NJ
Project #: NF000770.0001.00008
Client Purchase Order #:
Project Manager: Jim McLaughlin

Billing Information (if different from Report to)

Company Name:
Street Address:
City: State: Zip:
Attention:

Requested Analysis (see TEST CODE sheet)

Matrix Codes: DW - Drinking Water; GW - Ground Water; WW - Water; SW - Surface Water; SO - Soil; SL- Sludge; SED-Sediment; OI - Oil; LIQ - Other Liquid; AIR - Air; SOL - Other Solid; WP - Wipe; FB-Field Blank; EB-Equipment Blank; RB- Rinse Blank; TB-Trip Blank

Lab Sample #	Field ID / Point of Collection	MEOH/DI Vial #	Collection Date	Collection Time	Sampled by	Matrix	# of bottles	Number of preserved bottles: HCl	NaOH	HNO3	H2SO4	NONE	DI Water	MEOH	ENCORE	Total Chromium	Hexavalent Chromium	Trivalent Chromium	Antimony	Nickel	Thallium	Vanadium	LAB USE ONLY
1	FB (20190123)		1/23/19	1130	CC	FB	2			1		1				X	X	X	X	X	X	X	A20
2	SW-A8(8.0-8.5)		1/23/19	0845	CC	SO	1					1				X	X	X	X	X	X	X	G10
3	BS-A8T		1/23/19	0900	CC	SO	1					1				X	X	X	X	X	X	X	D40
4	BS-A1T		1/23/19	0910	CC	SO	1					1				X	X	X	X	X	X	X	
5	BS-A2T		1/23/19	0920	CC	SO	1					1				X	X	X	X	X	X	X	
6	BS-A1S		1/23/19	0930	CC	SO	1					1				X	X	X	X	X	X	X	
7	BS-A2S		1/23/19	0940	CC	SO	1					1				X	X	X	X	X	X	X	
8	SW-11(8.0-8.5)		1/23/19	0950	CC	SO	1					1				X	X	X	X	X	X	X	
9	SW-10(8.0-8.5)		1/23/19	1000	CC	SO	1					1				X	X	X	X	X	X	X	
10	SW-11(6.0-6.5)		1/23/19	1230	CC	SO	1					1				X	X	X	X	X	X	X	
11	SW-10(6.0-6.5)		1/23/19	1300	CC	SO	1					1				X	X	X	X	X	X	X	

Turnaround Time (Business days)

- [ ] Std. 10 Business Days
- [ ] 5 Day RUSH
- [ ] 3 Day RUSH
- [x] 2 Day RUSH
- [ ] 1 Day RUSH
- [ ] other

Emergency & Rush T/A data available via LabLink

Approved by (SGS Project Manager)/Date:

Data Deliverable Information

- [ ] Commercial "A" (Level 1)
- [ ] Commercial "B" (Level 2)
- [ ] FULLT1 (Level 3+4)
- [ ] NJ Reduced
- [ ] Commercial "C"
- [ ] NJ Data of Known Quality Protocol Reporting
- [ ] NYASP Category A
- [ ] NYASP Category B
- [ ] State Forms
- [x] EDD Format Equis
- [ ] Other

Commercial "A" = Results Only; Commercial "B" = Results + QC Summary
NJ Reduced = Results + QC Summary + Partial Raw data

Comments / Special Instructions

INITIAL ASSESSMENT 3B (N)
LABEL VERIFICATION
Sample inventory is verified upon receipt in the Laboratory

Sample Custody must be documented below each time samples change possession, including courier delivery.

	Relinquished by Sampler:	Date Time:	Received By:	Relinquished By:	Date Time:	Received By:
1		1/23/19 1430	Robert Chambers		1/23/19 1618	
2				Robert Chambers	1.23.19	
3	Relinquished by Sampler:	Date Time:	Received By:	Relinquished By:	Date Time:	Received By:
4						
5	Relinquished by:	Date Time:	Received By:	Custody Seal # 14168	[ ] Intact [ ] Not intact	Preserved where applicable [ ]

On Ice [x] Cooler Temp 1.6 3.7oc

Form:SM088-03C (revised 2/12/18)

http://www.sgs.com/en/terms-and-conditions.

5.2 5

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FED-EX Tracking # | Bottle Order Control #
SGS Quote # | SGS Job # JC81743

Company Name: Arcadis
Street Address: 10 Friends Lane
City: Newtown State: PA Zip: 18940
Project Contact: Matt Bold E-mail:
Phone # Fax #
Sampler(s) Name(s): Christ Cofakis Phone #

Project Name: PPG Site 107 Jersey City
Street: 18 Chappel Ave
City: Jersey City State: NJ
Project #: NP270.1.8
Client Purchase Order #
Project Manager: T. McLaughlin

Billing Information (If different from Report to)
Company Name
Street Address
City State Zip
Attention:

Matrix Codes: DW - Drinking Water; GW - Ground Water; WW - Water; SW - Surface Water; SO - Soil; SL- Sludge; SED-Sediment; OI - Oil; LIQ - Other Liquid; AIR - Air; SOL - Other Solid; WP - Wipe; FB-Field Blank; EB-Equipment Blank; RB- Rinse Blank; TB-Trip Blank

Lab Sample #	Field ID / Point of Collection	MEOH/DI Vial #	Collection Date	Collection Time	Sampled by	Matrix	# of bottles	Number of preserved bottles: HCl	NaOH	HNO3	H2SO4	NONE	DI Water	MEOH	ENCORE	Total Chromium	Hexavalent Chromium	Trivalent Chromium	Antimony	Nickel	Thallium	Vanadium				LAB USE ONLY
12	BS-A3D		1/23/19	1400	CC	SO	1						1			X	X	X	X	X	X	X				
13	BS-A3S		1/23/19	1340	CC	SO	1						1			X	X	X	X	X	X	X				
14	BS-A3T		1/23/19	1350	CC	SO	1						1			X	X	X	X	X	X	X				

Turnaround Time (Business days)
- [ ] Std. 10 Business Days
- [ ] 5 Day RUSH
- [ ] 3 Day RUSH
- [x] 2 Day RUSH
- [ ] 1 Day RUSH
- [ ] other

Approved by (SGS Project Manager)/Date:

Emergency & Rush T/A data available via LabLink

Data Deliverable Information
- [ ] Commercial "A" (Level 1)
- [ ] Commercial "B" (Level 2)
- [ ] FULLT1 (Level 3+4)
- [ ] NJ Reduced
- [ ] Commercial "C"
- [ ] NJ Data of Known Quality Protocol Reporting
- [ ] NYASP Category A
- [ ] NYASP Category B
- [ ] State Forms
- [x] EDD Format Equis
- [ ] Other

Commercial "A" = Results Only; Commercial "B" = Results + QC Summary
NJ Reduced = Results + QC Summary + Partial Raw data

Comments / Special Instructions

Sample inventory is verified upon receipt in the Laboratory

Sample Custody must be documented below each time samples change possession, including courier delivery.

Relinquished by Sampler:	Date Time:	Received By:	Relinquished By:	Date Time:	Received By:
1	1/23/19 1430	1 Robert Chambers	2 Robert Chambers	1-23-19 1610	2
Relinquished by Sampler:	Date Time:	Received By:	Relinquished By:	Date Time:	Received By:
3		3	4		4
Relinquished by:	Date Time:	Received By:	Custody Seal # 14168 ☐ Intact ☐ Not intact	Preserved where applicable ☐	On Ice ☒ Cooler Temp. 1.6 3.2
5		5			

Form:SM088-03C (revised 2/12/18)

http://www.sgs.com/en/terms-and-conditions.

Report of Analysis

Client Sample ID:	FB (20190123)		
Lab Sample ID:	JC81743-1	**Date Sampled:**	01/23/19
Matrix:	AQ - Field Blank Soil	**Date Received:**	01/23/19
		Percent Solids:	n/a
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	< 0.010	0.010	mg/l	1	01/23/19 22:28	LS	SW846 7196A
Redox Potential Vs H2	330		mv	1	01/24/19 10:20	RI	ASTM D1498-76
pH [a]	5.70		su	1	01/23/19 16:20	SUB	SM4500H+ B-11

(a) Sample received out of holding time for pH analysis.

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A0 (8.0-8.5)		
Lab Sample ID:	JC81743-2	**Date Sampled:**	01/23/19
Matrix:	SO - Soil	**Date Received:**	01/23/19
		Percent Solids:	72.4
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	0.77	0.55	mg/kg	1	01/25/19 13:46	DC	SW846 3060A/7196A
Redox Potential Vs H2	272		mv	1	01/24/19 11:56	RI	ASTM D1498-76M
Solids, Percent	72.4		%	1	01/24/19 09:30	EB	SM2540 G 18TH ED MOD
pH	6.12		su	1	01/24/19 11:47	RI	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-A0T		
Lab Sample ID:	JC81743-3	**Date Sampled:**	01/23/19
Matrix:	SO - Soil	**Date Received:**	01/23/19
		Percent Solids:	85.0
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	0.56	0.47	mg/kg	1	01/25/19 13:46	DC	SW846 3060A/7196A
Redox Potential Vs H2	275		mv	1	01/24/19 12:02	RI	ASTM D1498-76M
Solids, Percent	85		%	1	01/24/19 09:30	EB	SM2540 G 18TH ED MOD
pH	6.64		su	1	01/24/19 11:50	RI	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-A1T		
Lab Sample ID:	JC81743-4	**Date Sampled:**	01/23/19
Matrix:	SO - Soil	**Date Received:**	01/23/19
		Percent Solids:	71.6
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	1.3	0.56	mg/kg	1	01/25/19 13:46	DC	SW846 3060A/7196A
Redox Potential Vs H2	263		mv	1	01/24/19 12:07	RI	ASTM D1498-76M
Solids, Percent	71.6		%	1	01/24/19 09:30	EB	SM2540 G 18TH ED MOD
pH	6.63		su	1	01/24/19 11:57	RI	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-A2T		
Lab Sample ID:	JC81743-5	**Date Sampled:**	01/23/19
Matrix:	SO - Soil	**Date Received:**	01/23/19
		Percent Solids:	88.2
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	< 0.45	0.45	mg/kg	1	01/25/19 13:46	DC	SW846 3060A/7196A
Redox Potential Vs H2	267		mv	1	01/24/19 12:11	RI	ASTM D1498-76M
Solids, Percent	88.2		%	1	01/24/19 09:30	EB	SM2540 G 18TH ED MOD
pH	7.20		su	1	01/24/19 12:02	RI	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-A1		
Lab Sample ID:	JC81743-6	**Date Sampled:**	01/23/19
Matrix:	SO - Soil	**Date Received:**	01/23/19
		Percent Solids:	89.9
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	0.64	0.44	mg/kg	1	01/25/19 13:46	DC	SW846 3060A/7196A
Redox Potential Vs H2	271		mv	1	01/24/19 12:14	RI	ASTM D1498-76M
Solids, Percent	89.9		%	1	01/24/19 09:30	EB	SM2540 G 18TH ED MOD
pH	8.35		su	1	01/24/19 12:07	RI	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-A2		
Lab Sample ID:	JC81743-7	**Date Sampled:**	01/23/19
Matrix:	SO - Soil	**Date Received:**	01/23/19
		Percent Solids:	90.3
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	< 0.44	0.44	mg/kg	1	01/25/19 13:46	DC	SW846 3060A/7196A
Redox Potential Vs H2	271		mv	1	01/24/19 12:19	RI	ASTM D1498-76M
Solids, Percent	90.3		%	1	01/24/19 09:30	EB	SM2540 G 18TH ED MOD
pH	8.24		su	1	01/24/19 12:11	RI	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A11 (8.0-8.5)		
Lab Sample ID:	JC81743-8	**Date Sampled:**	01/23/19
Matrix:	SO - Soil	**Date Received:**	01/23/19
		Percent Solids:	84.6
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	0.95	0.47	mg/kg	1	01/25/19 13:46	DC	SW846 3060A/7196A
Redox Potential Vs H2	289		mv	1	01/24/19 12:25	RI	ASTM D1498-76M
Solids, Percent	84.6		%	1	01/24/19 09:30	EB	SM2540 G 18TH ED MOD
pH	6.74		su	1	01/24/19 12:14	RI	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A10 (8.0-8.5)		
Lab Sample ID:	JC81743-9	**Date Sampled:**	01/23/19
Matrix:	SO - Soil	**Date Received:**	01/23/19
		Percent Solids:	89.7
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	0.46	0.45	mg/kg	1	01/25/19 13:46	DC	SW846 3060A/7196A
Redox Potential Vs H2	280		mv	1	01/24/19 12:37	RI	ASTM D1498-76M
Solids, Percent	89.7		%	1	01/24/19 09:30	EB	SM2540 G 18TH ED MOD
pH	7.72		su	1	01/24/19 12:20	RI	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A11 (6.0-6.5)		
Lab Sample ID:	JC81743-10	**Date Sampled:**	01/23/19
Matrix:	SO - Soil	**Date Received:**	01/23/19
		Percent Solids:	87.1
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	< 0.46	0.46	mg/kg	1	01/25/19 13:46	DC	SW846 3060A/7196A
Redox Potential Vs H2	270		mv	1	01/24/19 12:46	RI	ASTM D1498-76M
Solids, Percent	87.1		%	1	01/24/19 09:30	EB	SM2540 G 18TH ED MOD
pH	6.87		su	1	01/24/19 12:41	RI	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A10 (6.0-6.5)		
Lab Sample ID:	JC81743-11	**Date Sampled:**	01/23/19
Matrix:	SO - Soil	**Date Received:**	01/23/19
		Percent Solids:	88.4
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	< 0.45	0.45	mg/kg	1	01/25/19 13:46	DC	SW846 3060A/7196A
Redox Potential Vs H2	262		mv	1	01/24/19 13:10	RI	ASTM D1498-76M
Solids, Percent	88.4		%	1	01/24/19 09:30	EB	SM2540 G 18TH ED MOD
pH	7.68		su	1	01/24/19 12:44	RI	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-A3D		
Lab Sample ID:	JC81743-12	**Date Sampled:**	01/23/19
Matrix:	SO - Soil	**Date Received:**	01/23/19
		Percent Solids:	81.2
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	0.84	0.49	mg/kg	1	01/25/19 13:48	DC	SW846 3060A/7196A
Redox Potential Vs H2	261		mv	1	01/24/19 13:12	RI	ASTM D1498-76M
Solids, Percent	81.2		%	1	01/24/19 09:30	EB	SM2540 G 18TH ED MOD
pH	6.32		su	1	01/24/19 12:46	RI	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-A3S		
Lab Sample ID:	JC81743-13	**Date Sampled:**	01/23/19
Matrix:	SO - Soil	**Date Received:**	01/23/19
		Percent Solids:	89.7
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	2.6	0.45	mg/kg	1	01/25/19 13:48	DC	SW846 3060A/7196A
Redox Potential Vs H2	260		mv	1	01/24/19 13:17	RI	ASTM D1498-76M
Solids, Percent	89.7		%	1	01/24/19 09:30	EB	SM2540 G 18TH ED MOD
pH	7.73		su	1	01/24/19 13:09	RI	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-A3T		
Lab Sample ID:	JC81743-14	**Date Sampled:**	01/23/19
Matrix:	SO - Soil	**Date Received:**	01/23/19
		Percent Solids:	90.6
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	0.63	0.44	mg/kg	1	01/25/19 13:38	DC	SW846 3060A/7196A
Redox Potential Vs H2	302		mv	1	01/24/19 11:43	RI	ASTM D1498-76M
Solids, Percent	90.6		%	1	01/24/19 09:30	EB	SM2540 G 18TH ED MOD
pH	8.04		su	1	01/24/19 11:43	RI	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID: FB (20190123)
Lab Sample ID: JC81743-1A
Matrix: AQ - Field Blank Soil
Project: PPG Site 107, 18 Chapel Avenue, Jersey City, NJ

Date Sampled: 01/23/19
Date Received: 01/23/19
Percent Solids: n/a

Total Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 6.0	6.0	ug/l	1	01/23/19	01/24/19	ND	SW846 6010D [1]	SW846 3010A [2]
Chromium	< 10	10	ug/l	1	01/23/19	01/24/19	ND	SW846 6010D [1]	SW846 3010A [2]
Nickel	< 10	10	ug/l	1	01/23/19	01/24/19	ND	SW846 6010D [1]	SW846 3010A [2]
Thallium	< 10	10	ug/l	1	01/23/19	01/24/19	ND	SW846 6010D [1]	SW846 3010A [2]
Vanadium	< 50	50	ug/l	1	01/23/19	01/24/19	ND	SW846 6010D [1]	SW846 3010A [2]

(1) Instrument QC Batch: MA46035
(2) Prep QC Batch: MP12239

RL = Reporting Limit

Report of Analysis

Client Sample ID:	FB (20190123)		
Lab Sample ID:	JC81743-1A	**Date Sampled:**	01/23/19
Matrix:	AQ - Field Blank Soil	**Date Received:**	01/23/19
		Percent Solids:	n/a
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	< 0.020	0.020	mg/l	1	01/24/19 21:41	ND	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A0 (8.0-8.5)		
Lab Sample ID:	JC81743-2A	**Date Sampled:**	01/23/19
Matrix:	SO - Soil	**Date Received:**	01/23/19
		Percent Solids:	72.4
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 2.7 UJ-	2.7	mg/kg	1	01/23/19	01/24/19	ND	SW846 6010D [1]	SW846 3050B [2]
Chromium	26.0	1.3	mg/kg	1	01/23/19	01/24/19	ND	SW846 6010D [1]	SW846 3050B [2]
Nickel	44.1	5.3	mg/kg	1	01/23/19	01/24/19	ND	SW846 6010D [1]	SW846 3050B [2]
Thallium	< 1.3	1.3	mg/kg	1	01/23/19	01/24/19	ND	SW846 6010D [1]	SW846 3050B [2]
Vanadium	30.6	6.6	mg/kg	1	01/23/19	01/24/19	ND	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA46034
(2) Prep QC Batch: MP12248

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A0 (8.0-8.5)		
Lab Sample ID:	JC81743-2A	**Date Sampled:**	01/23/19
Matrix:	SO - Soil	**Date Received:**	01/23/19
		Percent Solids:	72.4
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	25.2	1.9	mg/kg	1	01/25/19 13:46	DC	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-A0T		
Lab Sample ID:	JC81743-3A	**Date Sampled:**	01/23/19
Matrix:	SO - Soil	**Date Received:**	01/23/19
		Percent Solids:	85.0
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 2.3 UJ-	2.3	mg/kg	1	01/23/19	01/24/19	ND	SW846 6010D [1]	SW846 3050B [2]
Chromium	16.2	1.1	mg/kg	1	01/23/19	01/24/19	ND	SW846 6010D [1]	SW846 3050B [2]
Nickel	12.8	4.6	mg/kg	1	01/23/19	01/24/19	ND	SW846 6010D [1]	SW846 3050B [2]
Thallium	< 1.1	1.1	mg/kg	1	01/23/19	01/24/19	ND	SW846 6010D [1]	SW846 3050B [2]
Vanadium	23.6	5.7	mg/kg	1	01/23/19	01/24/19	ND	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA46034
(2) Prep QC Batch: MP12248

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-A0T		
Lab Sample ID:	JC81743-3A	**Date Sampled:**	01/23/19
Matrix:	SO - Soil	**Date Received:**	01/23/19
		Percent Solids:	85.0
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	15.6	1.6	mg/kg	1	01/25/19 13:46	DC	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-A1T		
Lab Sample ID:	JC81743-4A	**Date Sampled:**	01/23/19
Matrix:	SO - Soil	**Date Received:**	01/23/19
		Percent Solids:	71.6
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 2.7 UJ-	2.7	mg/kg	1	01/23/19	01/24/19	ND	SW846 6010D [1]	SW846 3050B [2]
Chromium	16.8	1.4	mg/kg	1	01/23/19	01/24/19	ND	SW846 6010D [1]	SW846 3050B [2]
Nickel	15.7	5.4	mg/kg	1	01/23/19	01/24/19	ND	SW846 6010D [1]	SW846 3050B [2]
Thallium	< 1.4	1.4	mg/kg	1	01/23/19	01/24/19	ND	SW846 6010D [1]	SW846 3050B [2]
Vanadium	26.7	6.8	mg/kg	1	01/23/19	01/24/19	ND	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA46034
(2) Prep QC Batch: MP12248

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-A1T		
Lab Sample ID:	JC81743-4A	**Date Sampled:**	01/23/19
Matrix:	SO - Soil	**Date Received:**	01/23/19
		Percent Solids:	71.6
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	15.5	2.0	mg/kg	1	01/25/19 13:46	DC	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-A2T		
Lab Sample ID:	JC81743-5A	**Date Sampled:**	01/23/19
Matrix:	SO - Soil	**Date Received:**	01/23/19
		Percent Solids:	88.2
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 2.2 UJ-	2.2	mg/kg	1	01/23/19	01/24/19	ND	SW846 6010D [1]	SW846 3050B [2]
Chromium	15.6	1.1	mg/kg	1	01/23/19	01/24/19	ND	SW846 6010D [1]	SW846 3050B [2]
Nickel	11.8	4.4	mg/kg	1	01/23/19	01/24/19	ND	SW846 6010D [1]	SW846 3050B [2]
Thallium	< 1.1	1.1	mg/kg	1	01/23/19	01/24/19	ND	SW846 6010D [1]	SW846 3050B [2]
Vanadium	23.5	5.5	mg/kg	1	01/23/19	01/24/19	ND	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA46034
(2) Prep QC Batch: MP12248

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-A2T		
Lab Sample ID:	JC81743-5A	**Date Sampled:**	01/23/19
Matrix:	SO - Soil	**Date Received:**	01/23/19
		Percent Solids:	88.2
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	15.6	1.6	mg/kg	1	01/25/19 13:46	DC	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-A1		
Lab Sample ID:	JC81743-6A	**Date Sampled:**	01/23/19
Matrix:	SO - Soil	**Date Received:**	01/23/19
		Percent Solids:	89.9
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 2.3 UJ-	2.3	mg/kg	1	01/23/19	01/24/19	ND	SW846 6010D [1]	SW846 3050B [2]
Chromium	22.3	1.2	mg/kg	1	01/23/19	01/24/19	ND	SW846 6010D [1]	SW846 3050B [2]
Nickel	19.8	4.7	mg/kg	1	01/23/19	01/24/19	ND	SW846 6010D [1]	SW846 3050B [2]
Thallium	< 1.2	1.2	mg/kg	1	01/23/19	01/24/19	ND	SW846 6010D [1]	SW846 3050B [2]
Vanadium	25.1	5.9	mg/kg	1	01/23/19	01/24/19	ND	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA46034
(2) Prep QC Batch: MP12248

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-A1		
Lab Sample ID:	JC81743-6A	**Date Sampled:**	01/23/19
Matrix:	SO - Soil	**Date Received:**	01/23/19
		Percent Solids:	89.9
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	21.7	1.6	mg/kg	1	01/25/19 13:46	DC	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-A2		
Lab Sample ID:	JC81743-7A	**Date Sampled:**	01/23/19
Matrix:	SO - Soil	**Date Received:**	01/23/19
		Percent Solids:	90.3
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 2.2 UJ-	2.2	mg/kg	1	01/23/19	01/24/19	ND	SW846 6010D [1]	SW846 3050B [2]
Chromium	17.3	1.1	mg/kg	1	01/23/19	01/24/19	ND	SW846 6010D [1]	SW846 3050B [2]
Nickel	12.7	4.4	mg/kg	1	01/23/19	01/24/19	ND	SW846 6010D [1]	SW846 3050B [2]
Thallium	< 1.1	1.1	mg/kg	1	01/23/19	01/24/19	ND	SW846 6010D [1]	SW846 3050B [2]
Vanadium	22.9	5.5	mg/kg	1	01/23/19	01/24/19	ND	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA46034
(2) Prep QC Batch: MP12248

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-A2		
Lab Sample ID:	JC81743-7A	**Date Sampled:**	01/23/19
Matrix:	SO - Soil	**Date Received:**	01/23/19
		Percent Solids:	90.3
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	16.9	1.5	mg/kg	1	01/25/19 13:46	DC	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A11 (8.0-8.5)		
Lab Sample ID:	JC81743-8A	**Date Sampled:**	01/23/19
Matrix:	SO - Soil	**Date Received:**	01/23/19
		Percent Solids:	84.6
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 2.3 UJ-	2.3	mg/kg	1	01/23/19	01/24/19	ND	SW846 6010D [1]	SW846 3050B [2]
Chromium	21.8	1.1	mg/kg	1	01/23/19	01/24/19	ND	SW846 6010D [1]	SW846 3050B [2]
Nickel	16.4	4.5	mg/kg	1	01/23/19	01/24/19	ND	SW846 6010D [1]	SW846 3050B [2]
Thallium	< 1.1	1.1	mg/kg	1	01/23/19	01/24/19	ND	SW846 6010D [1]	SW846 3050B [2]
Vanadium	32.1	5.6	mg/kg	1	01/23/19	01/24/19	ND	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA46034
(2) Prep QC Batch: MP12248

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A11 (8.0-8.5)		
Lab Sample ID:	JC81743-8A	**Date Sampled:**	01/23/19
Matrix:	SO - Soil	**Date Received:**	01/23/19
		Percent Solids:	84.6
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	20.9	1.6	mg/kg	1	01/25/19 13:46	DC	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A10 (8.0-8.5)		
Lab Sample ID:	JC81743-9A	**Date Sampled:**	01/23/19
Matrix:	SO - Soil	**Date Received:**	01/23/19
		Percent Solids:	89.7
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 2.2 UJ-	2.2	mg/kg	1	01/23/19	01/24/19	ND	SW846 6010D [1]	SW846 3050B [2]
Chromium	15.6	1.1	mg/kg	1	01/23/19	01/24/19	ND	SW846 6010D [1]	SW846 3050B [2]
Nickel	14.2	4.3	mg/kg	1	01/23/19	01/24/19	ND	SW846 6010D [1]	SW846 3050B [2]
Thallium	< 1.1	1.1	mg/kg	1	01/23/19	01/24/19	ND	SW846 6010D [1]	SW846 3050B [2]
Vanadium	20.9	5.4	mg/kg	1	01/23/19	01/24/19	ND	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA46034
(2) Prep QC Batch: MP12248

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A10 (8.0-8.5)		
Lab Sample ID:	JC81743-9A	**Date Sampled:**	01/23/19
Matrix:	SO - Soil	**Date Received:**	01/23/19
		Percent Solids:	89.7
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	15.1	1.6	mg/kg	1	01/25/19 13:46	DC	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A11 (6.0-6.5)		
Lab Sample ID:	JC81743-10A	**Date Sampled:**	01/23/19
Matrix:	SO - Soil	**Date Received:**	01/23/19
		Percent Solids:	87.1
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 2.3 UJ-	2.3	mg/kg	1	01/23/19	01/24/19	ND	SW846 6010D [1]	SW846 3050B [2]
Chromium	17.0	1.1	mg/kg	1	01/23/19	01/24/19	ND	SW846 6010D [1]	SW846 3050B [2]
Nickel	14.1	4.5	mg/kg	1	01/23/19	01/24/19	ND	SW846 6010D [1]	SW846 3050B [2]
Thallium	< 1.1	1.1	mg/kg	1	01/23/19	01/24/19	ND	SW846 6010D [1]	SW846 3050B [2]
Vanadium	27.6	5.7	mg/kg	1	01/23/19	01/24/19	ND	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA46034
(2) Prep QC Batch: MP12248

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A11 (6.0-6.5)		
Lab Sample ID:	JC81743-10A	**Date Sampled:**	01/23/19
Matrix:	SO - Soil	**Date Received:**	01/23/19
		Percent Solids:	87.1
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	17.0	1.6	mg/kg	1	01/25/19 13:46	DC	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A10 (6.0-6.5)		
Lab Sample ID:	JC81743-11A	**Date Sampled:**	01/23/19
Matrix:	SO - Soil	**Date Received:**	01/23/19
		Percent Solids:	88.4
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 2.3 UJ-	2.3	mg/kg	1	01/23/19	01/24/19	ND	SW846 6010D [1]	SW846 3050B [2]
Chromium	17.3	1.2	mg/kg	1	01/23/19	01/24/19	ND	SW846 6010D [1]	SW846 3050B [2]
Nickel	14.8	4.6	mg/kg	1	01/23/19	01/24/19	ND	SW846 6010D [1]	SW846 3050B [2]
Thallium	< 1.2	1.2	mg/kg	1	01/23/19	01/24/19	ND	SW846 6010D [1]	SW846 3050B [2]
Vanadium	23.6	5.8	mg/kg	1	01/23/19	01/24/19	ND	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA46034
(2) Prep QC Batch: MP12248

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A10 (6.0-6.5)		
Lab Sample ID:	JC81743-11A	**Date Sampled:**	01/23/19
Matrix:	SO - Soil	**Date Received:**	01/23/19
		Percent Solids:	88.4
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	17.3	1.7	mg/kg	1	01/25/19 13:46	DC	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-A3D		
Lab Sample ID:	JC81743-12A	**Date Sampled:**	01/23/19
Matrix:	SO - Soil	**Date Received:**	01/23/19
		Percent Solids:	81.2
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 2.5 UJ-	2.5	mg/kg	1	01/23/19	01/24/19	ND	SW846 6010D [1]	SW846 3050B [2]
Chromium	66.4	1.3	mg/kg	1	01/23/19	01/24/19	ND	SW846 6010D [1]	SW846 3050B [2]
Nickel	24.7	5.0	mg/kg	1	01/23/19	01/24/19	ND	SW846 6010D [1]	SW846 3050B [2]
Thallium	< 1.3	1.3	mg/kg	1	01/23/19	01/24/19	ND	SW846 6010D [1]	SW846 3050B [2]
Vanadium	31.3	6.3	mg/kg	1	01/23/19	01/24/19	ND	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA46034
(2) Prep QC Batch: MP12248

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-A3D		
Lab Sample ID:	JC81743-12A	**Date Sampled:**	01/23/19
Matrix:	SO - Soil	**Date Received:**	01/23/19
		Percent Solids:	81.2
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	65.6	1.8	mg/kg	1	01/25/19 13:48	DC	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-A3S		
Lab Sample ID:	JC81743-13A	**Date Sampled:**	01/23/19
Matrix:	SO - Soil	**Date Received:**	01/23/19
		Percent Solids:	89.7
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 2.3 UJ-	2.3	mg/kg	1	01/23/19	01/24/19	ND	SW846 6010D [1]	SW846 3050B [2]
Chromium	69.5	1.2	mg/kg	1	01/23/19	01/24/19	ND	SW846 6010D [1]	SW846 3050B [2]
Nickel	12.6	4.7	mg/kg	1	01/23/19	01/24/19	ND	SW846 6010D [1]	SW846 3050B [2]
Thallium	< 1.2	1.2	mg/kg	1	01/23/19	01/24/19	ND	SW846 6010D [1]	SW846 3050B [2]
Vanadium	22.7	5.9	mg/kg	1	01/23/19	01/24/19	ND	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA46034
(2) Prep QC Batch: MP12248

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-A3S		
Lab Sample ID:	JC81743-13A	**Date Sampled:**	01/23/19
Matrix:	SO - Soil	**Date Received:**	01/23/19
		Percent Solids:	89.7
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	66.9	1.7	mg/kg	1	01/25/19 13:48	DC	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-A3T		
Lab Sample ID:	JC81743-14A	**Date Sampled:**	01/23/19
Matrix:	SO - Soil	**Date Received:**	01/23/19
		Percent Solids:	90.6
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 2.2 UJ-	2.2	mg/kg	1	01/23/19	01/24/19	ND	SW846 6010D [1]	SW846 3050B [2]
Chromium	25.9	1.1	mg/kg	1	01/23/19	01/24/19	ND	SW846 6010D [1]	SW846 3050B [2]
Nickel	16.5	4.4	mg/kg	1	01/23/19	01/24/19	ND	SW846 6010D [1]	SW846 3050B [2]
Thallium	< 1.1	1.1	mg/kg	1	01/23/19	01/24/19	ND	SW846 6010D [1]	SW846 3050B [2]
Vanadium	23.1	5.5	mg/kg	1	01/23/19	01/24/19	ND	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA46034
(2) Prep QC Batch: MP12248

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-A3T		
Lab Sample ID:	JC81743-14A	**Date Sampled:**	01/23/19
Matrix:	SO - Soil	**Date Received:**	01/23/19
		Percent Solids:	90.6
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	25.3	1.5	mg/kg	1	01/25/19 13:38	DC	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

CHAIN OF CUSTODY

SGS North America Inc. - Dayton
2235 Route 130, Dayton, NJ 08810
TEL. 732-329-0200 FAX 732-329-3499
www.sgs.com/ehsusa

PAGE 1 OF 1

SO FB

FED-EX Tracking # | Bottle Order Control #
SGS Quote # | SGS Job # JC81864

Client / Reporting Information

Company Name: Arcadis
Street Address: 10 Friends Lane Suite 200
City: Newtown State: PA Zip: 18940
Project Contact: Matt Bell E-mail:
Phone #: 646.762.5629 Fax #:
Sampler(s) Name(s): Christa Cifelli Phone #:

Project Information

Project Name: PPG Jersey City Site 107
Street: 18 Chapel Ave
City: Jersey City State: NJ
Project #: NJ000770.0001.00008
Client Purchase Order #:
Project Manager: Jim McLaughlin

Billing Information (if different from Report to)

Company Name:
Street Address:
City: State: Zip:
Attention:

Requested Analysis (see TEST CODE sheet)

Matrix Codes: DW - Drinking Water; GW - Ground Water; WW - Water; SW - Surface Water; SO - Soil; SL - Sludge; SED-Sediment; OI - Oil; LIQ - Other Liquid; AIR - Air; SOL - Other Solid; WP - Wipe; FB-Field Blank; EB-Equipment Blank; RB- Rinse Blank; TB-Trip Blank

Lab Sample #	Field ID / Point of Collection	MEOH/DI Vial #	Collection Date	Collection Time	Sampled by	Matrix	# of bottles	Number of preserved bottles: HCl	NaOH	HNO3	H2SO4	NONE	DI Water	MEOH	ENCORE	Total Chromium	Hexavalent Chromium	Trivalent Chromium	Antimony	Nickel	Thallium	Vanadium	LAB USE ONLY
1	FB(20190125)		1/25/19	1400	CC	FB	2			1		1				X	X	X	X	X	X	X	
2	BS-A18		1/25/19	0930	CC	SO	1					1				X	X	X	X	X	X	X	
3	BS-A19		1/25/19	0945	CC	SO	1					1				X	X	X	X	X	X	X	A20
4	BS-A17		1/25/19	1000	CC	SO	1					1				X	X	X	X	X	X	X	C27
5	108_M016_1		1/25/19	1200	CC	SO	1					1				X	X	X	X	X	X	X	B9
6	107-M034N		1/25/19	1315	CC	SO	1					1				X	X	X	X	X	X	X	
7	108-M018N_1		1/25/19	1215	CC	SO	1					1				X	X	X	X	X	X	X	
8	108-M018N		1/25/19	1230	CC	SO	1					1				X	X	X	X	X	X	X	
	~~107-M034N~~		~~1/25/19~~																				
	107_1																						

Turnaround Time (Business days)

Approved by (SGS Project Manager)/Date:

- [ ] Std. 10 Business Days
- [ ] 5 Day RUSH
- [ ] 3 Day RUSH
- [x] 2 Day RUSH
- [ ] 1 Day RUSH
- [ ] other

Emergency & Rush T/A data available via LabLink

Data Deliverable Information

- [ ] Commercial "A" (Level 1)
- [ ] Commercial "B" (Level 2)
- [ ] FULLT1 (Level 3+4)
- [ ] NJ Reduced
- [ ] Commercial "C"
- [ ] NJ Data of Known Quality Protocol Reporting
- [ ] NYASP Category A
- [ ] NYASP Category B
- [ ] State Forms
- [x] EDD Format Equis
- [ ] Other

Commercial "A" = Results Only; Commercial "B" = Results + QC Summary
NJ Reduced = Results + QC Summary + Partial Raw data

Comments / Special Instructions

INITIAL ASESSMENT 3B TK
LABEL VERIFICATION

Sample inventory is verified upon receipt in the Laboratory

Sample Custody must be documented below each time samples change possession, including courier delivery.

1 Relinquished by Sampler:	Date Time: 1/25/19 1429	1 Received By: Robert Greenberg	2 Relinquished By: Robert Greenberg	Date Time: 1/25/19 1604	2 Received By:		
3 Relinquished by Sampler:	Date Time:	3 Received By:	4 Relinquished By:	Date Time:	4 Received By:		
5 Relinquished by:	Date Time:	5 Received By:	Custody Seal # 31042	[ ] Intact [ ] Not intact	Preserved where applicable	On Ice: Y	Cooler Temp: IG 3.2°

Form:SM088-03C (revised 2/12/18)

http://www.sgs.com/en/terms-and-conditions.

Report of Analysis

Client Sample ID:	FB(20190125)		
Lab Sample ID:	JC81864-1	**Date Sampled:**	01/25/19
Matrix:	AQ - Field Blank Soil	**Date Received:**	01/25/19
		Percent Solids:	n/a
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	< 0.010	0.010	mg/l	1	01/25/19 18:28	DC	SW846 7196A
Redox Potential Vs H2	372		mv	1	01/27/19 15:10	RB	ASTM D1498-76
pH [a]	5.36		su	1	01/25/19 16:36	SUB	SM4500H+ B-11

(a) Sample received out of holding time for pH analysis.

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-A18		
Lab Sample ID:	JC81864-2	**Date Sampled:**	01/25/19
Matrix:	SO - Soil	**Date Received:**	01/25/19
		Percent Solids:	88.1
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
~~Chromium, Hexavalent~~	~~0.89~~	~~0.45~~	~~mg/kg~~	~~1~~	~~01/28/19 14:58~~	~~DC~~	~~SW846 3060A/7196A~~
Redox Potential Vs H2	326		mv	1	01/27/19 08:52	RB	ASTM D1498-76M
Solids, Percent	88.1		%	1	01/28/19 08:26	RC	SM2540 G 18TH ED MOD
pH	7.71 J		su	1	01/27/19 09:55	RB	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-A19		
Lab Sample ID:	JC81864-3	**Date Sampled:**	01/25/19
Matrix:	SO - Soil	**Date Received:**	01/25/19
		Percent Solids:	87.1
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
~~Chromium, Hexavalent~~	~~0.63~~	~~0.46~~	~~mg/kg~~	~~1~~	~~01/28/19 15:02~~	~~DC~~	~~SW846 3060A/7196A~~
Redox Potential Vs H2	323		mv	1	01/27/19 08:55	RB	ASTM D1498-76M
Solids, Percent	87.1		%	1	01/28/19 08:26	RC	SM2540 G 18TH ED MOD
pH	7.80 J		su	1	01/27/19 09:59	RB	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-A17		
Lab Sample ID:	JC81864-4	**Date Sampled:**	01/25/19
Matrix:	SO - Soil	**Date Received:**	01/25/19
		Percent Solids:	79.0
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
~~Chromium, Hexavalent~~	~~< 0.51~~	~~0.51~~	~~mg/kg~~	~~1~~	~~01/28/19 15:02~~	~~DC~~	~~SW846 3060A/7196A~~
Redox Potential Vs H2	320		mv	1	01/27/19 08:57	RB	ASTM D1498-76M
Solids, Percent	79		%	1	01/28/19 08:26	RC	SM2540 G 18TH ED MOD
pH	7.27 J		su	1	01/27/19 10:12	RB	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID:	108_M016_1		
Lab Sample ID:	JC81864-5	**Date Sampled:**	01/25/19
Matrix:	SO - Soil	**Date Received:**	01/25/19
		Percent Solids:	83.9
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
~~Chromium, Hexavalent~~	~~2.4~~	~~0.48~~	~~mg/kg~~	~~1~~	~~01/28/19 15:02~~	~~DC~~	~~SW846 3060A/7196A~~
Redox Potential Vs H2	304		mv	1	01/27/19 09:01	RB	ASTM D1498-76M
Solids, Percent	83.9		%	1	01/28/19 08:26	RC	SM2540 G 18TH ED MOD
pH	7.97 J		su	1	01/27/19 10:17	RB	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID:	107_M034N		
Lab Sample ID:	JC81864-6	**Date Sampled:**	01/25/19
Matrix:	SO - Soil	**Date Received:**	01/25/19
		Percent Solids:	87.3
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
~~Chromium, Hexavalent~~	~~0.73~~	~~0.46~~	~~mg/kg~~	~~1~~	~~01/28/19 15:02~~	~~DC~~	~~SW846 3060A/7196A~~
Redox Potential Vs H2	302		mv	1	01/27/19 09:05	RB	ASTM D1498-76M
Solids, Percent	87.3		%	1	01/28/19 08:26	RC	SM2540 G 18TH ED MOD
pH	8.00 J		su	1	01/27/19 10:26	RB	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID:	108_M018N_1		
Lab Sample ID:	JC81864-7	**Date Sampled:**	01/25/19
Matrix:	SO - Soil	**Date Received:**	01/25/19
		Percent Solids:	90.3
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
~~Chromium, Hexavalent~~	~~3.1~~	~~0.44~~	~~mg/kg~~	~~1~~	~~01/28/19 15:02~~	~~DC~~	~~SW846 3060A/7196A~~
Redox Potential Vs H2	299		mv	1	01/27/19 09:11	RB	ASTM D1498-76M
Solids, Percent	90.3		%	1	01/28/19 08:26	RC	SM2540 G 18TH ED MOD
pH	8.08 J		su	1	01/27/19 10:30	RB	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID:	108_M018N		
Lab Sample ID:	JC81864-8	**Date Sampled:**	01/25/19
Matrix:	SO - Soil	**Date Received:**	01/25/19
		Percent Solids:	87.6
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
~~Chromium, Hexavalent~~	~~6.0~~	~~0.46~~	~~mg/kg~~	~~1~~	~~01/28/19 15:02~~	~~DC~~	~~SW846 3060A/7196A~~
Redox Potential Vs H2	280		mv	1	01/27/19 09:20	RB	ASTM D1498-76M
Solids, Percent	87.6		%	1	01/28/19 08:26	RC	SM2540 G 18TH ED MOD
pH	8.30 J		su	1	01/27/19 10:47	RB	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-A18		
Lab Sample ID:	JC81864-2R	**Date Sampled:**	01/25/19
Matrix:	SO - Soil	**Date Received:**	01/25/19
		Percent Solids:	88.1
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	1.3	0.45	mg/kg	1	01/31/19 13:27	DC	SW846 3060A/7196A

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-A19		
Lab Sample ID:	JC81864-3R	**Date Sampled:**	01/25/19
Matrix:	SO - Soil	**Date Received:**	01/25/19
		Percent Solids:	87.1
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	< 0.46	0.46	mg/kg	1	01/31/19 13:32	DC	SW846 3060A/7196A

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-A17		
Lab Sample ID:	JC81864-4R	**Date Sampled:**	01/25/19
Matrix:	SO - Soil	**Date Received:**	01/25/19
		Percent Solids:	79.0
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	0.64	0.51	mg/kg	1	01/31/19 13:32	DC	SW846 3060A/7196A

RL = Reporting Limit

Report of Analysis

Client Sample ID:	108_M016_1		
Lab Sample ID:	JC81864-5R	**Date Sampled:**	01/25/19
Matrix:	SO - Soil	**Date Received:**	01/25/19
		Percent Solids:	83.9
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	1.3	0.48	mg/kg	1	01/31/19 13:32	DC	SW846 3060A/7196A

RL = Reporting Limit

Report of Analysis

Client Sample ID:	107_M034N		
Lab Sample ID:	JC81864-6R	**Date Sampled:**	01/25/19
Matrix:	SO - Soil	**Date Received:**	01/25/19
		Percent Solids:	87.3
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	< 0.46	0.46	mg/kg	1	01/31/19 13:32	DC	SW846 3060A/7196A

RL = Reporting Limit

Report of Analysis

Client Sample ID:	108_M018N_1		
Lab Sample ID:	JC81864-7R	**Date Sampled:**	01/25/19
Matrix:	SO - Soil	**Date Received:**	01/25/19
		Percent Solids:	90.3
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	2.3	0.44	mg/kg	1	01/31/19 13:32	DC	SW846 3060A/7196A

RL = Reporting Limit

Report of Analysis

Client Sample ID:	108_M018N		
Lab Sample ID:	JC81864-8R	**Date Sampled:**	01/25/19
Matrix:	SO - Soil	**Date Received:**	01/25/19
		Percent Solids:	87.6
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	6.1	0.46	mg/kg	1	01/31/19 13:32	DC	SW846 3060A/7196A

RL = Reporting Limit

Report of Analysis

Client Sample ID: FB(20190125)
Lab Sample ID: JC81864-1A
Matrix: AQ - Field Blank Soil
Project: PPG Site 107, 18 Chapel Avenue, Jersey City, NJ

Date Sampled: 01/25/19
Date Received: 01/25/19
Percent Solids: n/a

Total Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 6.0	6.0	ug/l	1	01/26/19	01/28/19	PP	SW846 6010D [1]	SW846 3010A [2]
Chromium	< 10	10	ug/l	1	01/26/19	01/28/19	PP	SW846 6010D [1]	SW846 3010A [2]
Nickel	< 10	10	ug/l	1	01/26/19	01/28/19	PP	SW846 6010D [1]	SW846 3010A [2]
Thallium	< 10	10	ug/l	1	01/26/19	01/28/19	PP	SW846 6010D [1]	SW846 3010A [2]
Vanadium	< 50	50	ug/l	1	01/26/19	01/28/19	PP	SW846 6010D [1]	SW846 3010A [2]

(1) Instrument QC Batch: MA46051
(2) Prep QC Batch: MP12282

RL = Reporting Limit

Report of Analysis

Client Sample ID:	FB(20190125)		
Lab Sample ID:	JC81864-1A	**Date Sampled:**	01/25/19
Matrix:	AQ - Field Blank Soil	**Date Received:**	01/25/19
		Percent Solids:	n/a
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	< 0.020	0.020	mg/l	1	01/28/19 10:45	PP	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-A18		
Lab Sample ID:	JC81864-2A	**Date Sampled:**	01/25/19
Matrix:	SO - Soil	**Date Received:**	01/25/19
		Percent Solids:	88.1
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony [a]	< 4.5 UJ-	4.5	mg/kg	2	01/25/19	01/28/19	PP	SW846 6010D [1]	SW846 3050B [2]
Chromium	33.3	1.1	mg/kg	1	01/25/19	01/28/19	PP	SW846 6010D [1]	SW846 3050B [2]
Nickel	18.1	4.5	mg/kg	1	01/25/19	01/28/19	PP	SW846 6010D [1]	SW846 3050B [2]
Thallium	< 1.1	1.1	mg/kg	1	01/25/19	01/28/19	PP	SW846 6010D [1]	SW846 3050B [2]
Vanadium	50.9	5.7	mg/kg	1	01/25/19	01/28/19	PP	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA46051
(2) Prep QC Batch: MP12281

(a) Elevated detection limit due to dilution required for high interfering element.

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-A18		
Lab Sample ID:	JC81864-2A	**Date Sampled:**	01/25/19
Matrix:	SO - Soil	**Date Received:**	01/25/19
		Percent Solids:	88.1
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	~~32.4~~ 32.0	1.6	mg/kg	1	01/28/19 14:58	DC	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-A19		
Lab Sample ID:	JC81864-3A	**Date Sampled:**	01/25/19
Matrix:	SO - Soil	**Date Received:**	01/25/19
		Percent Solids:	87.1
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 2.3 UJ-	2.3	mg/kg	1	01/25/19	01/28/19	PP	SW846 6010D [1]	SW846 3050B [2]
Chromium	18.0	1.2	mg/kg	1	01/25/19	01/28/19	PP	SW846 6010D [1]	SW846 3050B [2]
Nickel	14.9	4.6	mg/kg	1	01/25/19	01/28/19	PP	SW846 6010D [1]	SW846 3050B [2]
Thallium	< 1.2	1.2	mg/kg	1	01/25/19	01/28/19	PP	SW846 6010D [1]	SW846 3050B [2]
Vanadium	30.4	5.8	mg/kg	1	01/25/19	01/28/19	PP	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA46051
(2) Prep QC Batch: MP12281

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-A19		
Lab Sample ID:	JC81864-3A	**Date Sampled:**	01/25/19
Matrix:	SO - Soil	**Date Received:**	01/25/19
		Percent Solids:	87.1
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	~~17.4~~ 18.0	1.7	mg/kg	1	01/28/19 15:02	DC	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-A17		
Lab Sample ID:	JC81864-4A	**Date Sampled:**	01/25/19
Matrix:	SO - Soil	**Date Received:**	01/25/19
		Percent Solids:	79.0
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 2.4 UJ-	2.4	mg/kg	1	01/25/19	01/28/19	PP	SW846 6010D [1]	SW846 3050B [2]
Chromium	13.8	1.2	mg/kg	1	01/25/19	01/28/19	PP	SW846 6010D [1]	SW846 3050B [2]
Nickel	13.1	4.9	mg/kg	1	01/25/19	01/28/19	PP	SW846 6010D [1]	SW846 3050B [2]
Thallium	< 1.2	1.2	mg/kg	1	01/25/19	01/28/19	PP	SW846 6010D [1]	SW846 3050B [2]
Vanadium	22.2	6.1	mg/kg	1	01/25/19	01/28/19	PP	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA46051
(2) Prep QC Batch: MP12281

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-A17		
Lab Sample ID:	JC81864-4A	**Date Sampled:**	01/25/19
Matrix:	SO - Soil	**Date Received:**	01/25/19
		Percent Solids:	79.0
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	~~13.8~~ 13.2	1.7	mg/kg	1	01/28/19 15:02	DC	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	108_M016_1		
Lab Sample ID:	JC81864-5A	**Date Sampled:**	01/25/19
Matrix:	SO - Soil	**Date Received:**	01/25/19
		Percent Solids:	83.9
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 2.4 UJ-	2.4	mg/kg	1	01/25/19	01/28/19	PP	SW846 6010D [1]	SW846 3050B [2]
Chromium	37.4	1.2	mg/kg	1	01/25/19	01/28/19	PP	SW846 6010D [1]	SW846 3050B [2]
Nickel	16.5	4.8	mg/kg	1	01/25/19	01/28/19	PP	SW846 6010D [1]	SW846 3050B [2]
Thallium	< 1.2	1.2	mg/kg	1	01/25/19	01/28/19	PP	SW846 6010D [1]	SW846 3050B [2]
Vanadium	24.7	6.0	mg/kg	1	01/25/19	01/28/19	PP	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA46051
(2) Prep QC Batch: MP12281

RL = Reporting Limit

Report of Analysis

Client Sample ID:	108_M016_1		
Lab Sample ID:	JC81864-5A	**Date Sampled:**	01/25/19
Matrix:	SO - Soil	**Date Received:**	01/25/19
		Percent Solids:	83.9
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	~~35.0~~ 36.1	1.7	mg/kg	1	01/28/19 15:02	DC	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID: 107_M034N
Lab Sample ID: JC81864-6A
Matrix: SO - Soil
Project: PPG Site 107, 18 Chapel Avenue, Jersey City, NJ

Date Sampled: 01/25/19
Date Received: 01/25/19
Percent Solids: 87.3

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 2.2 UJ-	2.2	mg/kg	1	01/25/19	01/28/19	PP	SW846 6010D [1]	SW846 3050B [2]
Chromium	18.8	1.1	mg/kg	1	01/25/19	01/28/19	PP	SW846 6010D [1]	SW846 3050B [2]
Nickel	16.6	4.4	mg/kg	1	01/25/19	01/28/19	PP	SW846 6010D [1]	SW846 3050B [2]
Thallium	< 1.1	1.1	mg/kg	1	01/25/19	01/28/19	PP	SW846 6010D [1]	SW846 3050B [2]
Vanadium	25.7	5.5	mg/kg	1	01/25/19	01/28/19	PP	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA46051
(2) Prep QC Batch: MP12281

RL = Reporting Limit

Report of Analysis

Client Sample ID:	107_M034N		
Lab Sample ID:	JC81864-6A	**Date Sampled:**	01/25/19
Matrix:	SO - Soil	**Date Received:**	01/25/19
		Percent Solids:	87.3
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	~~18.1~~ 18.8	1.6	mg/kg	1	01/28/19 15:02	DC	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID: 108_M018N_1
Lab Sample ID: JC81864-7A
Matrix: SO - Soil
Project: PPG Site 107, 18 Chapel Avenue, Jersey City, NJ

Date Sampled: 01/25/19
Date Received: 01/25/19
Percent Solids: 90.3

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 2.3 UJ-	2.3	mg/kg	1	01/25/19	01/28/19	PP	SW846 6010D [1]	SW846 3050B [2]
Chromium	64.2	1.2	mg/kg	1	01/25/19	01/28/19	PP	SW846 6010D [1]	SW846 3050B [2]
Nickel	26.0	4.7	mg/kg	1	01/25/19	01/28/19	PP	SW846 6010D [1]	SW846 3050B [2]
Thallium	< 1.2	1.2	mg/kg	1	01/25/19	01/28/19	PP	SW846 6010D [1]	SW846 3050B [2]
Vanadium	29.1	5.8	mg/kg	1	01/25/19	01/28/19	PP	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA46051
(2) Prep QC Batch: MP12281

RL = Reporting Limit

Report of Analysis

Client Sample ID:	108_M018N_1		
Lab Sample ID:	JC81864-7A	**Date Sampled:**	01/25/19
Matrix:	SO - Soil	**Date Received:**	01/25/19
		Percent Solids:	90.3
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	~~61.1~~ 61.9	1.6	mg/kg	1	01/28/19 15:02	DC	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	108_M018N		
Lab Sample ID:	JC81864-8A	**Date Sampled:**	01/25/19
Matrix:	SO - Soil	**Date Received:**	01/25/19
		Percent Solids:	87.6
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 2.3 UJ-	2.3	mg/kg	1	01/25/19	01/28/19	PP	SW846 6010D [1]	SW846 3050B [2]
Chromium	30.6	1.2	mg/kg	1	01/25/19	01/28/19	PP	SW846 6010D [1]	SW846 3050B [2]
Nickel	14.8	4.6	mg/kg	1	01/25/19	01/28/19	PP	SW846 6010D [1]	SW846 3050B [2]
Thallium	< 1.2	1.2	mg/kg	1	01/25/19	01/28/19	PP	SW846 6010D [1]	SW846 3050B [2]
Vanadium	25.5	5.8	mg/kg	1	01/25/19	01/28/19	PP	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA46051
(2) Prep QC Batch: MP12281

RL = Reporting Limit

Report of Analysis

Client Sample ID:	108_M018N		
Lab Sample ID:	JC81864-8A	**Date Sampled:**	01/25/19
Matrix:	SO - Soil	**Date Received:**	01/25/19
		Percent Solids:	87.6
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	~~24.6~~ 24.5	1.7	mg/kg	1	01/28/19 15:02	DC	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

ARCADIS Design & Consultancy for natural and built assets

PPG Industries

DATA QUALITY ASSESSMENT

Site 107 Fashionland

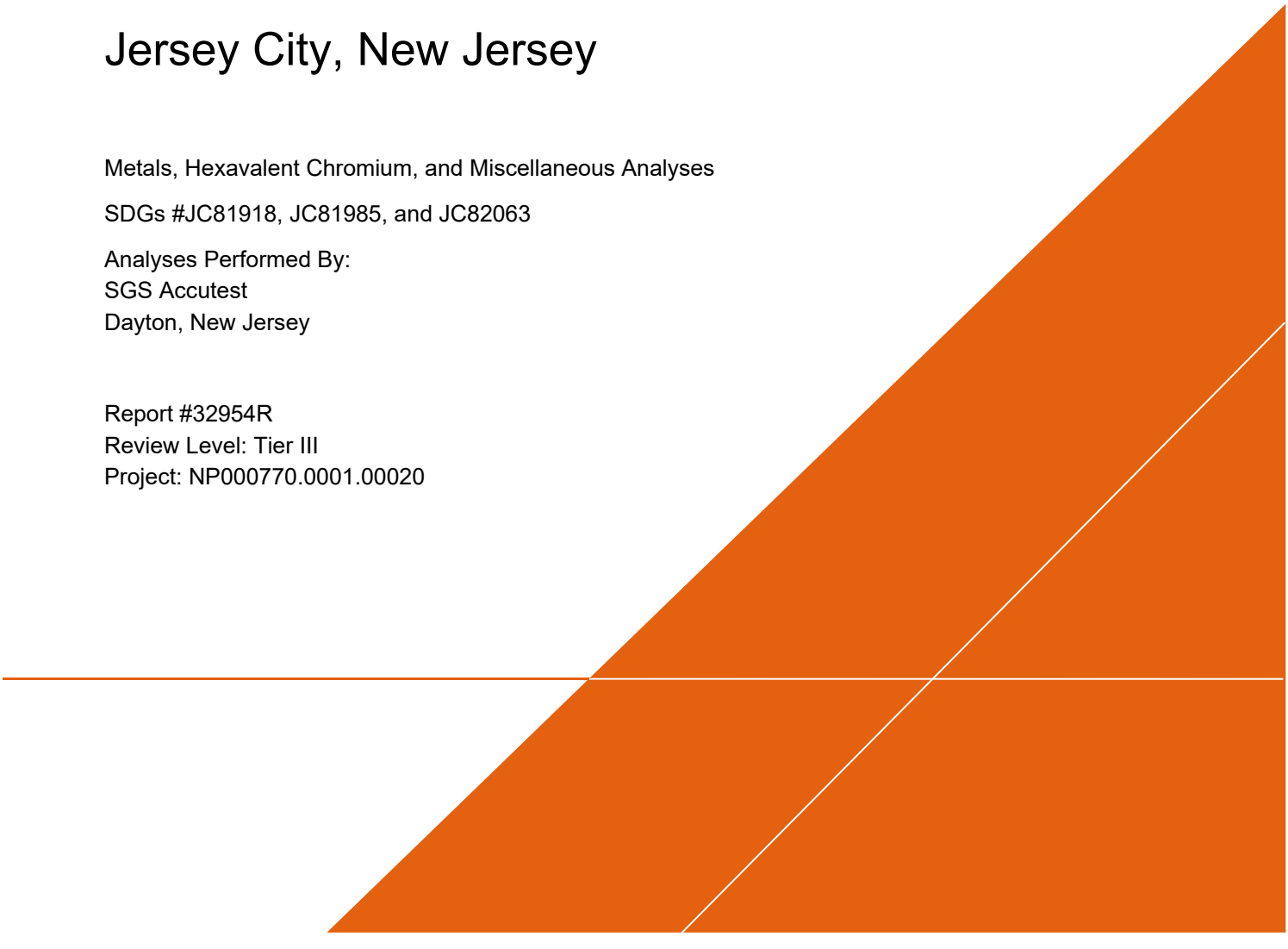
Jersey City, New Jersey

Metals, Hexavalent Chromium, and Miscellaneous Analyses

SDGs #JC81918, JC81985, and JC82063

Analyses Performed By:
SGS Accutest
Dayton, New Jersey

Report #32954R
Review Level: Tier III
Project: NP000770.0001.00020



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Groups (SDGs) # JC81918, JC81985, and JC82063 for samples collected in association with the PPG Industries Site 107 Fashionland, Jersey City, New Jersey Site. The review was conducted as a Tier III evaluation and included review of data package completeness. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

SDG	Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis		
						Cr VI	MET	MISC
JC81918	FB(20190128)	JC81918-1	Water	1/28/2019		X	X	X
	BS-A4	JC81918-2	Soil	1/28/2019		X	X	X
JC81985	FB(20190129)	JC81985-1	Water	1/29/2019		X	X	X
	SW-A12(0.0-0.5)	JC81985-2	Soil	1/29/2019		X	X	X
	SW-A12(1.0-1.5)	JC81985-3	Soil	1/29/2019		X	X	X
	SW-A13(0.0-0.5)	JC81985-4	Soil	1/29/2019		X	X	X
	SW-A13(2.0-2.5)	JC81985-5	Soil	1/29/2019		X	X	X
	SW-A14(0.0-0.5)	JC81985-6	Soil	1/29/2019		X	X	X
	SW-A14(2.0-2.5)	JC81985-7	Soil	1/29/2019		X	X	X
	SW-A15(0.0-0.5)	JC81985-8	Soil	1/29/2019		X	X	X
	SW-A15(2.0-2.5)	JC81985-9	Soil	1/29/2019		X	X	X
	SW-A16(0.0-0.5)	JC81985-10	Soil	1/29/2019		X	X	X
	SW-A16(2.0-2.5)	JC81985-11	Soil	1/29/2019		X	X	X
	SW-A17(0.0-0.5)	JC81985-12	Soil	1/29/2019		X	X	X
	SW-A17(2.0-2.5)	JC81985-13	Soil	1/29/2019		X	X	X
	BS-A20	JC81985-14	Soil	1/29/2019		X	X	X
JC82063	FB(20190129)-108	JC82063-1	Water	1/29/2019		X	X	X
	BS-A3	JC82063-2	Soil	1/29/2019		X	X	X
	BS-A3TT	JC82063-3	Soil	1/29/2019		X	X	X
	108_M018N	JC82063-4	Soil	1/29/2019		X	X	X
	108_M018N_1	JC82063-5	Soil	1/29/2019		X	X	X
	BS-A4	JC82063-6	Soil	1/29/2019		X	X	X

Notes:

1. Metals include antimony, chromium, nickel, thallium, and vanadium. Trivalent chromium is reported by calculation (Chromium) – (Hexavalent Chromium).

2. Cr VI is hexavalent chromium.
3. Miscellaneous parameters include pH and redox potential.
4. SDG #JC81985: Miscellaneous parameters for sample SW-A16(0.0-0.5) also include ferrous iron, sulfide screen, and total organic carbon (TOC).

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of QA or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

Note:
QA - Quality Assurance

INORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Methods 6010C, 7196A, and 9045D; Standard Methods (SM) 4500H+B and SM4500S2-A; Lloyd Kahn; and ASTM D1498-76 and D3872-86. Data were reviewed in accordance with USEPA Region 2 SOP HW-2b, Revision 15 (December 2012); New Jersey Division of Remediation Management and Response Standard Operating Procedure for Analytical Data Validation of Hexavalent Chromium (September 2009); New Jersey Department of Environmental Protection Data Quality Assessment and Data Usability Evaluation Technical Guidance (April 2014); Field Sampling Plan/Quality Assurance Project Plan, PPG Non-Residential and Residential Chromium Sites, Hudson County, New Jersey (AECOM, June 2010); and Arcadis Quality Assurance Project Plan – Addendum, Site 107 Fashionland, Jersey City, New Jersey (Arcadis, June 2018).

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and that it was already subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with the USEPA National Functional Guidelines:

- Concentration (C) Qualifiers
  - U The analyte was analyzed for but not detected. The associated value is the analyte instrument detection limit.
  - B The reported value was obtained from a reading less than the reporting limit (RL), but greater than or equal to the method detection limit (MDL).
- Quantitation (Q) Qualifiers
  - E The reported value is estimated due to the presence of interference.
  - N Spiked sample recovery is not within control limits.
  - * Duplicate analysis is not within control limits.
- Validation Qualifiers
  - J The analyte was positively identified; however, the associated numerical value is an estimated concentration only.
  - J+ The result is an estimated quantity, but the result may be biased high.
  - J- The result is an estimated quantity, but the result may be biased low.
  - UJ The analyte was not detected above the reporting limit. However, the reported limit is approximate and may or may not represent the actual limit of detection.
  - UB Analyte considered non-detect at the listed value due to associated blank contamination.
  - R The data are unusable. The sample results are rejected due to serious deficiencies in meeting Quality Control (QC) critieria. The analyte may or may not be present in the sample.

Two facts should be noted by all data users. First, the “R” flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. “R” values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

METALS ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 6010C	Water	180 days from collection to analysis	Preserved to a pH of less than 2; Cool to <6°C
	Soil	180 days from collection to analysis	Cool to <6°C

All samples were analyzed within the specified holding times.

2. Blank Contamination

Quality assurance (QA) blanks (i.e., method and rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank is calculated for QA blanks containing concentrations greater than the method detection limit (MDL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Analytes were not detected above the MDL in the associated blanks; therefore, detected sample results were not associated with blank contamination.

3. Calibration

Satisfactory instrument calibration is established to provide that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument's continuing performance is satisfactory.

3.1 Initial Calibration and Continuing Calibration

The correct number and type of standards were analyzed. The correlation coefficient of the initial calibration was greater than 0.998 and all initial calibration verification standard and continuing calibration verification standard recoveries were within control limits of 90% to 110%.

All continuing calibration verification standard recoveries were within the control limit.

3.2 Low-Level Calibration Verification

The low-level initial and continuing calibration check standard serves to verify the linearity of calibration of the analysis at the reporting limit.

All RL standard recoveries were within control limits of 70% to 130% (50% to 150% for antimony and thallium).

3.3 ICP Interference Control Sample (ICS)

The ICS verifies the laboratories interelement and background correction factors.

All ICS exhibited recoveries within the control limits of 80% to 120%.

4. Matrix Spike/Matrix Spike Duplicate (MS/MSD)/Laboratory Duplicate Analysis

MS/MSD and laboratory duplicate data are used to assess the precision and accuracy of the analytical method.

4.1 MS/MSD Analysis

All metal analytes must exhibit a percent recovery within the established acceptance limits of 75% to 125%. The MS/MSD recovery control limits do not apply for MS/MSD performed on sample locations where the analyte's concentration detected in the parent sample exceeds the MS/MSD concentration by a factor of four or greater.

The MS/MSD analysis was not performed using a sample from these SDGs.

4.2 Laboratory Duplicate Analysis

The laboratory duplicate relative percent difference (RPD) criterion is applied when parent and duplicate sample concentrations are greater than or equal to 5 times the RL. A control limit of 20% for water matrices and 35% for soil matrices is applied when the criteria above is true. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of ± the RL is applied.

The laboratory duplicate analysis was not performed using a sample from these SDGs.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 50% for soil matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of three times the RL is applied for soil matrices.

A field duplicate sample was not collected in association with these SDGs.

6. Laboratory Control Sample (LCS) Analysis

The LCS analysis is used to assess the accuracy of the analytical method independent of matrix interferences. The analytes associated with the LCS analysis must exhibit a percent recovery between the control limits of 80% and 120%.

The LCS analysis exhibited recoveries and RPDs within the control limits.

7. Serial Dilution

The serial dilution analysis is used to assess if a significant physical or chemical interference exists due to sample matrix. Analytes exhibiting concentrations greater than 10 times the RL in the undiluted sample are evaluated to determine if matrix interference exists. These analytes are required to have less than a

10% difference (%D) between sample results from the undiluted (parent) sample and results associated with the same sample analyzed with a five-fold dilution.

The serial dilution analysis was not performed using a sample from these SDGs.

8. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR METALS

METALS: SW-846 6010C	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Inductively Coupled Plasma-Atomic Emission Spectrometry (ICP-AES)					
Tier II Validation					
Holding Times		X		X	
Reporting limits (units)		X		X	
Blanks					
A. Instrument Blanks		X		X	
B. Method Blanks		X		X	
C. Equipment/Field Blanks		X		X	
Laboratory Control Sample (LCS)		X		X	
Laboratory Control Sample Duplicate (LCSD)	X				X
LCS/LCSD Precision (RPD)	X				X
Matrix Spike (MS) %R	X				X
Matrix Spike Duplicate (MSD) %R	X				X
MS/MSD Precision (RPD)	X				X
Field/Lab Duplicate (RPD)	X				X
ICP Serial Dilution %D	X				X
Total vs. Dissolved	X				X
Reporting Limit Verification		X		X	
Tier III Validation					
Initial Calibration Verification		X		X	
Continuing Calibration Verification		X		X	
CRDL Standard Recovery		X		X	
ICP Interference Check		X		X	
ICP-MS Internal Standards	X				X
Transcription/calculations acceptable		X		X	
Raw Data	X				X
Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%R Percent recovery

RPD Relative percent difference

%D Percent difference

HEXAVALENT CHROMIUM ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 7196A	Water	24 hours from collection to analysis	Cool to <6°C
SW-846 3060A/ 7196A	Soil	30 days from collection to extraction; 7 days from extraction to analysis	Cool to <6°C

The analyses that exceeded the holding are presented in the following table.

Sample Locations	Method	Holding Time	Criteria
FB(20190129)-108	SW-846 7196A	29.5 hours	< 24 hours from collection

Sample results were qualified as specified in the table below. All other holding times were met.

Criteria	Qualification	
	Detected Analytes	Non-detect Analytes
Analysis completed less than two times holding time	J	UJ

2. Blank Contamination

Quality assurance (QA) blanks (i.e., method and rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank is calculated for QA blanks containing concentrations greater than the method detection limit (MDL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Analytes were not detected above the MDL in the associated blanks; therefore, detected sample results were not associated with blank contamination.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

The correct number and type of standards were analyzed. The correlation coefficient of the initial calibration was greater than 0.995 and all calibration verification standard recoveries were within control limits of 90% to 110%.

4. Matrix Spike (MS)/Post-Digestion Spike (PDS)/Laboratory Duplicate Analysis

MS, PDS, and laboratory duplicate data are used to assess the precision and accuracy of the analytical method.

4.1 MS Analysis

Soluble and insoluble spike sample analyses are designed to provide information about the effect of the sample matrix on the digestion and measurement methodology. The insoluble spike is used to evaluate the dissolution during the digestion process. Hexavalent chromium must exhibit a percent recovery within the established acceptance limits of 75% to 125% in both the soluble and insoluble spiked analyses. The control limits do not apply when the parent sample concentration exceeds the spike amount by a factor of four or greater.

SDG #JC81918: The MS analysis performed on sample location BS-A4 in association with the insoluble and soluble hexavalent chromium analysis exhibited recoveries within the control limits.

SDGs #JC81985: The MS analysis performed on sample locations SW-A16(0.0-0.5) in association with the insoluble hexavalent chromium analysis exhibited recoveries within the control limits.

SDGs #JC82063: The MS analysis performed on sample locations BS-A3 in association with the soluble hexavalent chromium analysis exhibited recoveries within the control limits.

SDGs #JC81985 and JC82063: The MS analysis performed on sample locations SW-A16(0.0-0.5) and BS-A3 exhibited spike recoveries less than the lower control limits as presented in the table below.

Sample Location	Analyte	Initial Spike Recovery	Reanalysis Spike Recovery
SW-A16(0.0-0.5)	Hexavalent Chromium, Soluble	60.7%	< 50%
BS-A3	Hexavalent Chromium, Insoluble	> 125% but < 150%	AC (99.7%)

Notes:

AC = Acceptable

The criteria used to evaluate spike recoveries are presented in the following table. The qualifications are applied to all sample results associated with the sample preparation batch. In the event of a recovery outside of the control limits, the MS must be reanalyzed.

Control limit	Sample Result	Qualification[1]
Spike recovery ≥ 50% but < 75%	Non-detect	UJ-
	Detect	J-
Spike recovery < 50%	Non-detect	R
	Detect	R
Spike recovery > 125%	Non-detect	No Action
Spike recovery > 125% but ≤ 150%	Detect	J+
Spike recovery > 150%	Detect	R

Notes:

[1] If recoveries are < 50% or > 150% for both insoluble and soluble spikes, associated data will be rejected ("R"); otherwise qualify associated data if one of the spikes is outside the < 50% or > 150% limits.

SDG #JC82063: The reanalysis of the field sample is usable. No qualification of the sample results was required.

SDG #JC81985: The original analyses of the field samples are usable with appropriate qualification. No sample results were rejected.

4.2 Post-Digestion Spike (PDS) Analysis

The PDS analysis is designed to verify that neither a reducing condition nor a chemical interference is affecting the analysis. This is accomplished by analyzing a second aliquot of the pH-adjusted filtrate that has been spiked with hexavalent chromium. The PDS must exhibit a percent recovery within the method acceptance limits of 85% to 115%.

The PDS analysis performed on sample locations BS-A4, SW-A16(0.0-0.5), and BS-A3 exhibited recoveries within the control limits.

4.3 Laboratory Duplicate Analysis

The laboratory duplicate relative percent difference (RPD) criterion is applied when parent and duplicate sample concentrations are greater than or equal to four times the RL. A control limit of 20% is applied when the criteria above is true. In the instance when the parent and/or duplicate sample concentrations are less than or equal to four times the RL, a control limit of ± the RL is used.

The laboratory duplicate analysis performed on sample locations BS-A4, SW-A16(0.0-0.5), and BS-A3 exhibited results within the control limit.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 50% for soil matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of three times the RL is applied for soil matrices.

A field duplicate sample was not collected in association with these SDGs.

6. Laboratory Control Sample (LCS) Analysis

The LCS analysis is used to assess the precision and accuracy of the analytical method independent of matrix interferences. The analytes associated with the LCS analysis must exhibit a percent recovery between the control limits of 80% and 120%.

The LCS analysis exhibited recoveries within the control limits.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR HEXAVALENT CHROMIUM

HEXAVALENT CHROMIUM: SW-846 7196A	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Spectrophotometer					
Tier II Validation					
Holding Times		X	X		
Reporting limits (units)		X		X	
Blanks					
A. Instrument Blanks		X		X	
B. Method Blanks		X		X	
C. Equipment/Field Blanks		X		X	
Laboratory Control Sample (LCS)		X		X	
Matrix Spike (MS) %R		X	X		
Matrix Spike Duplicate (MSD) %R	X				X
MS/MSD Precision (RPD)	X				X
Post Digestion Spike %R		X		X	
Field/Lab Duplicate (RPD)		X		X	
Dilution Factor		X		X	
Tier III Validation					
Initial calibration %RSD or correlation coefficient		X		X	
Continuing calibration %R		X		X	
Raw Data		X		X	
Transcription/calculation errors present		X		X	
Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%R Percent recovery

RPD Relative percent difference

%RSD Relative percent deviation

GENERAL CHEMISTRY ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
pH by SM4500H+B	Water	QAPP: 24 hours of receipt at laboratory	Cool to <6°C
pH by SW846 9045D	Soil	QAPP: 24 hours of receipt at laboratory	Cool to <6°C
Oxidation-Reduction Potential by ASTM D1498-76	Water	Not applicable	Cool to <6°C
Oxidation-Reduction Potential (Redox) by ASTM D1498-76	Soil	Measure immediately after creating leachate	Cool to <6°C
Ferrous Iron by ASTM D3872-86	Soil	24 hours from collection to analysis	Cool to <6°C
Sulfide Screen by SM4500S2-A	Soil	7 days from collection to analysis	Cool to <6°C
Total Organic Carbon (TOC) by Lloyd Kahn	Soil	14 days from collection to analysis	Cool to <6°C

The analyses that exceeded the holding are presented in the following table.

Sample Locations	Method	Holding Time	Criteria
BS-A3 BS-A3TT 108_M018N 108_M018N_1 BS-A4	SW846 9045D	Analysis: 2 days	< 24 hours of receipt by laboratory
SW-A16(0.0-0.5)	ASTM D3872-86	Analysis: 9 days	< 24 hours from collection
SW-A16(0.0-0.5)	SM4500S2-A	Analysis: 9 days	< 7 days from collection

Sample results were qualified as specified in the table below. All other holding times were met.

Criteria	Qualification	
	Detected Analytes	Non-detect Analytes
Analysis completed less than two times holding time	J	UJ
Analysis completed greater than two times holding time	J	R

2. Blank Contamination

Quality assurance (QA) blanks (i.e., method and rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank is calculated for QA blanks containing concentrations greater than the method detection limit (MDL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Method blank analysis is not applicable for Redox and pH analyses.

Ferrous iron, sulfide, and TOC were not detected above the MDL in the associated blanks; therefore, detected sample results were not associated with blank contamination.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

The correct number and type of standards were analyzed. All buffer check results were within acceptance limits.

4. Laboratory Duplicate Analysis

Laboratory duplicate data are used to assess the precision of the analytical method. The laboratory duplicate relative percent difference (RPD) criterion is applied when parent and duplicate sample concentrations are greater than or equal to 5 times the RL. A control limit of 20% for water matrices and 35% for soil matrices is applied when the criteria above is true. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of ± the RL is applied.

SDGs #JC81918 and JC82063: The laboratory duplicate analysis was not performed using a sample from these SDGs.

SDG #JC81985: The laboratory duplicate analysis performed on sample locations SW-A12(0.0-0.5) and SW-A16(0.0-0.5) exhibited results within the control limit.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 50% for soil matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of three times the RL is applied for soil matrices.

A field duplicate sample was not collected in association with these SDGs.

6. Laboratory Control Sample (LCS) Analysis

The LCS analysis is used to assess the precision and accuracy of the analytical method independent of matrix interferences. The analytes associated with the LCS analysis must exhibit a percent recovery between the control limits of 80% and 120%.

LCS results for redox potential, pH, and sulfide screen were not reported in the analytical report.

The LCS analysis performed in association with ferrous iron and TOC exhibited recoveries within the control limits.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR GENERAL CHEMISTRY

General Chemistry: SM4500H+B, SW846 9045D, ASTM D1498-76	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Miscellaneous Instrumentation					
Tier II Validation					
Holding times		X	X		
Reporting limits (units)		X		X	
Blanks					
A. Instrument Blanks		X		X	
B. Method blanks		X		X	
C. Equipment blanks		X		X	
Laboratory Control Sample (LCS) %R		X		X	
Laboratory Control Sample Duplicate (LCSD) %R	X				X
LCS/LCSD Precision (RPD)	X				X
Matrix Spike (MS) %R	X				X
Matrix Spike Duplicate (MSD) %R	X				X
MS/MSD Precision (RPD)	X				X
Field/Lab Duplicate (RPD)		X		X	
Dilution Factor		X		X	
Tier III Validation					
Initial calibration %RSD or correlation coefficient	X				X
Continuing calibration %R	X				X
Raw Data		X		X	
Transcription/calculation errors present		X		X	
Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%R Percent recovery

RPD Relative percent difference

VALIDATION PERFORMED BY: Jennifer Singer

SIGNATURE: 

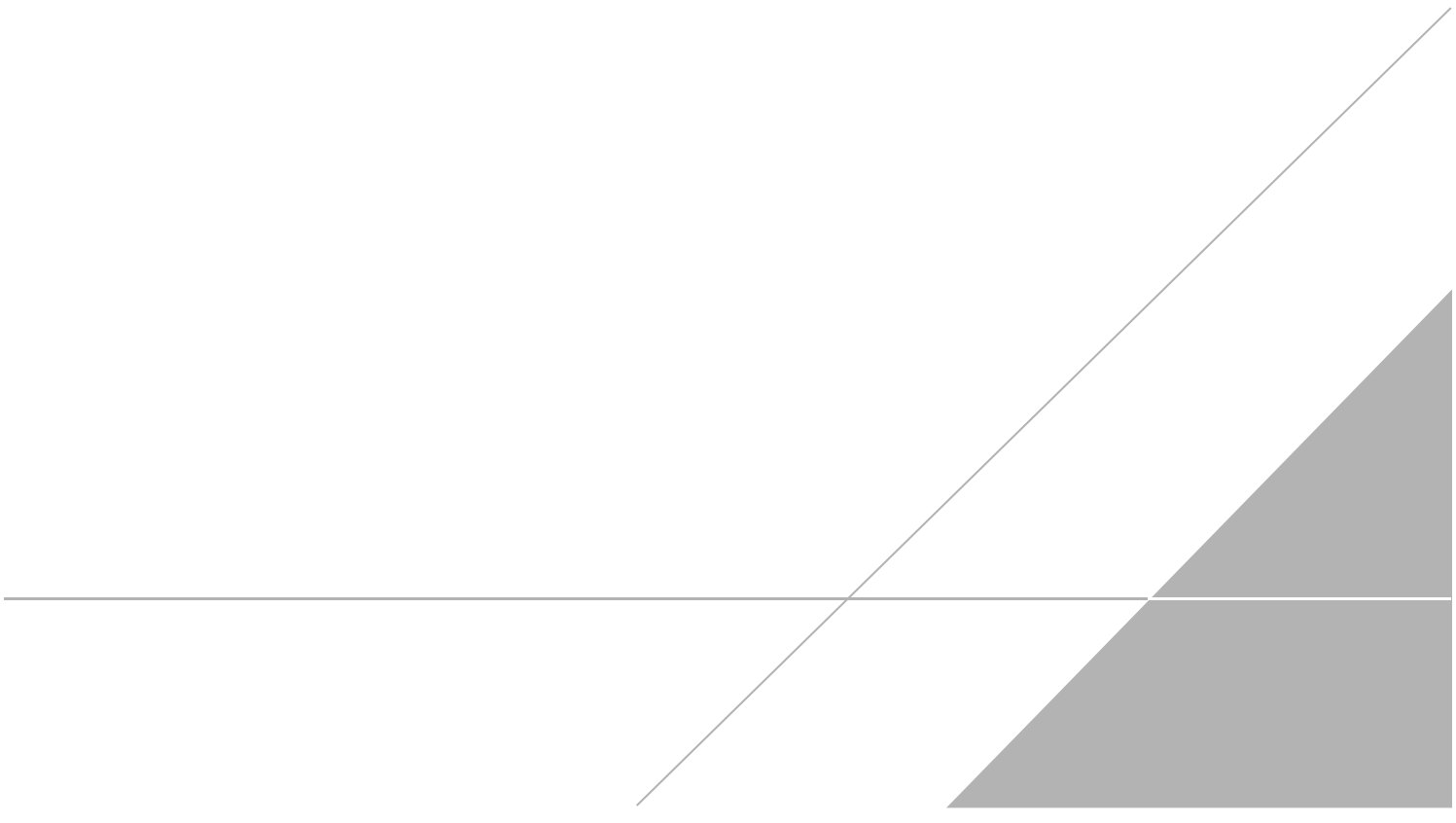
DATE: June 5, 2019

PEER REVIEW: Dennis Capria

DATE: June 27, 2019

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS



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PAGE 1 OF 1

FED-EX Tracking #
SGS Quote #
Bottle Order Control #
SGS Job # JC81918

Client / Reporting Information

Company Name: Arcadis
Street Address: 10 Friends Lane Suite 200
City: Newtown State: PA Zip: 18940
Project Contact: Matt Bell E-mail:
Phone #: 646.762.5629 Fax #:
Sampler(s) Name(s): Christa Cifelli Phone #: 201.264.8065

Project Information

Project Name: PPG Jersey City Site 107
Street: 18 Chapel Avenue
City: Jersey City State: NJ
Project #: NP000770.0001.00008
Client Purchase Order #:
Project Manager: Jim McLaughlin

Billing Information (if different from Report to)

Company Name:
Street Address:
City State Zip:
Attention:

Requested Analysis (see TEST CODE sheet)

Matrix Codes: DW - Drinking Water; GW - Ground Water; WW - Water; SW - Surface Water; SO - Soil; SL- Sludge; SED-Sediment; OI - Oil; LIQ - Other Liquid; AIR - Air; SOL - Other Solid; WP - Wipe; FB-Field Blank; EB-Equipment Blank; RB- Rinse Blank; TB-Trip Blank

Lab Sample #	Field ID / Point of Collection	MEOH/DI Vial #	Collection Date	Collection Time	Sampled by	Matrix	# of bottles	Number of preserved bottles: HCl	NaOH	HNO3	H2SO4	NONE	DI Water	MEOH	ENCORE	Total Chromium	Hexavalent Chromium	Trivalent Chromium	Antimony	Nickel	Thallium	Vanadium	LAB USE ONLY
1	FB(20190128)		1/28/19	1200	CC	FB	2			1		1				X	X	X	X	X	X	X	
2	BS-A4		1/28/19	1200	CC	SO	1					1				X	X	X	X	X	X	X	A20 C29 C60

Turnaround Time (Business days)

- [ ] Std. 10 Business Days
- [ ] 5 Day RUSH
- [ ] 3 Day RUSH
- [X] 2 Day RUSH
- [ ] 1 Day RUSH
- [ ] other

Approved by (SGS Project Manager)/Date:

Emergency & Rush T/A data available via LabLink

Data Deliverable Information

- [ ] Commercial "A" (Level 1)
- [ ] Commercial "B" (Level 2)
- [ ] FULLT1 (Level 3+4)
- [ ] NJ Reduced
- [ ] Commercial "C"
- [ ] NJ Data of Known Quality Protocol Reporting
- [ ] NYASP Category A
- [ ] NYASP Category B
- [ ] State Forms
- [X] EDD Format Equis
- [ ] Other

Commercial "A" = Results Only; Commercial "B" = Results + QC Summary
NJ Reduced = Results + QC Summary + Partial Raw data

Comments / Special Instructions

INITIAL ASESSMENT
FINAL VERIFICATION
Sample inventory is verified upon receipt in the Laboratory

Sample Custody must be documented below each time samples change possession, including courier delivery.

	Relinquished by Sampler:	Date Time:	Received By:	Relinquished By:	Date Time:	Received By:
1		1/28/19 1358	1	2	1-28-19 1622	2
3			3	4		4
5			5	Custody Seal # 14184 ☐ Intact ☐ Not intact	Preserved where applicable ☐	On Ice X Cooler Temp 1.6 3.2.0C

Form:SM088-03C (revised 2/12/18)

http://www.sgs.com/en/terms-and-conditions.

JC81918: Chain of Custody
Page 1 of 2

Report of Analysis

Client Sample ID:	FB(20190128)		
Lab Sample ID:	JC81918-1	**Date Sampled:**	01/28/19
Matrix:	AQ - Field Blank Soil	**Date Received:**	01/28/19
		Percent Solids:	n/a
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	< 0.010	0.010	mg/l	1	01/28/19 19:43	DC	SW846 7196A
Redox Potential Vs H2	345		mv	1	01/29/19 11:19	ST	ASTM D1498-76
pH [a]	5.70		su	1	01/28/19 17:10	FR	SM4500H+ B-11

(a) Sample received out of holding time for pH analysis.

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-A4		
Lab Sample ID:	JC81918-2	**Date Sampled:**	01/28/19
Matrix:	SO - Soil	**Date Received:**	01/28/19
		Percent Solids:	86.3
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	2.9	0.46	mg/kg	1	01/29/19 17:26	NV	SW846 3060A/7196A
Redox Potential Vs H2	311		mv	1	01/29/19	ST	ASTM D1498-76M
Solids, Percent	86.3		%	1	01/29/19 12:39	BG	SM2540 G 18TH ED MOD
pH	7.89		su	1	01/29/19 13:10	ST	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID: FB(20190128)
Lab Sample ID: JC81918-1A
Matrix: AQ - Field Blank Soil
Project: PPG Site 107, 18 Chapel Avenue, Jersey City, NJ

Date Sampled: 01/28/19
Date Received: 01/28/19
Percent Solids: n/a

Total Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 6.0	6.0	ug/l	1	01/29/19	01/29/19	GT	SW846 6010D [1]	SW846 3010A [2]
Chromium	< 10	10	ug/l	1	01/29/19	01/29/19	GT	SW846 6010D [1]	SW846 3010A [2]
Nickel	< 10	10	ug/l	1	01/29/19	01/29/19	GT	SW846 6010D [1]	SW846 3010A [2]
Thallium	< 10	10	ug/l	1	01/29/19	01/29/19	GT	SW846 6010D [1]	SW846 3010A [2]
Vanadium	< 50	50	ug/l	1	01/29/19	01/29/19	GT	SW846 6010D [1]	SW846 3010A [2]

(1) Instrument QC Batch: MA46055
(2) Prep QC Batch: MP12303

RL = Reporting Limit

Report of Analysis

Client Sample ID:	FB(20190128)		
Lab Sample ID:	JC81918-1A	**Date Sampled:**	01/28/19
Matrix:	AQ - Field Blank Soil	**Date Received:**	01/28/19
		Percent Solids:	n/a
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	< 0.020	0.020	mg/l	1	01/29/19 18:18	GT	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-A4		
Lab Sample ID:	JC81918-2A	**Date Sampled:**	01/28/19
Matrix:	SO - Soil	**Date Received:**	01/28/19
		Percent Solids:	86.3
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 2.2	2.2	mg/kg	1	01/28/19	01/29/19	GT	SW846 6010D [1]	SW846 3050B [2]
Chromium	21.7	1.1	mg/kg	1	01/28/19	01/29/19	GT	SW846 6010D [1]	SW846 3050B [2]
Nickel	14.3	4.5	mg/kg	1	01/28/19	01/29/19	GT	SW846 6010D [1]	SW846 3050B [2]
Thallium	< 1.1	1.1	mg/kg	1	01/28/19	01/29/19	GT	SW846 6010D [1]	SW846 3050B [2]
Vanadium	20.8	5.6	mg/kg	1	01/28/19	01/29/19	GT	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA46055
(2) Prep QC Batch: MP12302

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-A4		
Lab Sample ID:	JC81918-2A	**Date Sampled:**	01/28/19
Matrix:	SO - Soil	**Date Received:**	01/28/19
		Percent Solids:	86.3
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	18.8	1.6	mg/kg	1	01/29/19 17:26	NV	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

SO FB

CHAIN OF CUSTODY

PAGE 1 OF 2

SGS North America Inc. - Dayton
2235 Route 130, Dayton, NJ 08810
TEL. 732-329-0200 FAX 732-329-3499
www.sgs.com/ehsusa

FED-EX Tracking #: | Bottle Order Control #:
SGS Quote #: | SGS Job #: JC81985

Client / Reporting Information

Company Name: Arcadis
Street Address: 10 Friends Lane Suite 200
City: Newtown State: PA Zip: 18940
Project Contact: Matt Bell E-mail:
Phone #: 646.762.5629 Fax #:
Sampler(s) Name(s): Christin Cifilli Phone #:

Project Information

Project Name: PPG Jersey City Site 107
Street: 18 Chapel Avenue
City: Jersey City State: NJ
Project #: NP000770.0001.00008
Client Purchase Order #:
Project Manager: Jim McLaughlin

Billing information (if different from Report to)

Company Name:
Street Address:
City: State: Zip:
Attention:

Requested Analysis (see TEST CODE sheet)

Matrix Codes: DW - Drinking Water; GW - Ground Water; WW - Water; SW - Surface Water; SO - Soil; SL - Sludge; SED-Sediment; OI - Oil; LIQ - Other Liquid; AIR - Air; SOL - Other Solid; WP - Wipe; FB-Field Blank; EB-Equipment Blank; RB- Rinse Blank; TB-Trip Blank

Lab Sample #	Field ID / Point of Collection	MEOH/DI Vial #	Collection Date	Collection Time	Sampled by	Matrix	# of bottles	Preserved: HCl	NaOH	HNO3	H2SO4	NONE	DI Water	MEOH	ENCORE	Total Chromium	Hexavalent Chromium	Trivalent Chromium	Antimony	Nickel	Thallium	Vanadium	LAB USE ONLY
1	FB(20190129)		1/29/19	1200	CC	FB	2			1		1				X	X	X	X	X	X	X	A24
2	SW-A12(0.0-0.5)		1/29/19	0900	CC	SO	1					1				X	X	X	X	X	X	X	G3
3	SW-A12(1.0-1.5)		1/29/19	0910	CC	SO	1					1				X	X	X	X	X	X	X	M26
4	SW-A13(0.0-0.5)		1/29/19	0930	CC	SO	1					1				X	X	X	X	X	X	X	
5	SW-A13(2.0-2.5)		1/29/19	0940	CC	SO	1					1				X	X	X	X	X	X	X	
6	SW-A14(0.0-0.5)		1/29/19	0950	CC	SO	1					1				X	X	X	X	X	X	X	
7	SW-A14(2.0-2.5)		1/29/19	1000	CC	SO	1					1				X	X	X	X	X	X	X	
8	SW-A15(0.0-0.5)		1/29/19	1010	CC	SO	1					1				X	X	X	X	X	X	X	
9	SW-A15(2.0-2.5)		1/29/19	1020	CC	SO	1					1				X	X	X	X	X	X	X	
10	SW-A16(0.0-0.5)		1/29/19	1030	CC	SO	1					1				X	X	X	X	X	X	X	
11	SW-A16(2.0-2.5)		1/29/19	1040	CC	SO	1					1				X	X	X	X	X	X	X	

INITIAL ASSESSMENT - 3 Add
LABEL VERIFICATION

Turnaround Time (Business days)

Approved by (SGS Project Manager)/Date:

- [ ] Std. 10 Business Days
- [ ] 5 Day RUSH
- [ ] 3 Day RUSH
- [x] 2 Day RUSH
- [ ] 1 Day RUSH
- [ ] other

Emergency & Rush T/A data available via LabLink

Data Deliverable Information

- [ ] Commercial "A" (Level 1)
- [ ] Commercial "B" (Level 2)
- [ ] FULLT1 (Level 3+4)
- [ ] NJ Reduced
- [ ] Commercial "C"
- [ ] NJ Data of Known Quality Protocol Reporting
- [ ] NYASP Category A
- [ ] NYASP Category B
- [ ] State Forms
- [x] EDD Format Equis
- [ ] Other

Commercial "A" = Results Only; Commercial "B" = Results + QC Summary
NJ Reduced = Results + QC Summary + Partial Raw data

Comments / Special Instructions

Sample inventory is verified upon receipt in the Laboratory

Sample Custody must be documented below each time samples change possession, including courier delivery.

	Relinquished by Sampler:	Date Time:	Received By:	Relinquished By:	Date Time:	Received By:
1		1/29/19 1410	Robert Chambers	Robert Chambers	1.29.19 1503	
2						
3						
4						
5						

Custody Seal # 18518 [ ] Intact [ ] Not intact
Preserved where applicable [ ]
On Ice [x] Cooler Temp 3.1°C

Form:SM088-03C (revised 2/12/18)

http://www.sgs.com/en/terms-and-conditions.

CHAIN OF CUSTODY

SGS North America Inc. - Dayton
2235 Route 130, Dayton, NJ 08810
TEL. 732-329-0200 FAX 732-329-3499
www.sgs.com/ehsusa

FED-EX Tracking # | Bottle Order Control #
SGS Quote # | SGS Job # JC81985

Client / Reporting Information

Company Name: Arcadis
Street Address: 10 Friends Lane Suite 200
City: Newtown State: PA Zip: 18940
Project Contact: Matt Bell E-mail:
Phone #: 646.762.5629 Fax #:
Sampler(s) Name(s): Christina Cirelli Phone #: 201.264.9405

Project Information

Project Name: PPG Jersey City Site 107
Street: 18 Chapel Avenue
City: Jersey City State: NJ
Project #: NP000770.0001.00008
Client Purchase Order #:
Project Manager: Jim McLaughlin

Billing Information (if different from Report to)

Company Name:
Street Address:
City: State: Zip:
Attention:

Requested Analysis (see TEST CODE sheet)

Matrix Codes: DW - Drinking Water; GW - Ground Water; WW - Water; SW - Surface Water; SO - Soil; SL - Sludge; SED-Sediment; OI - Oil; LIQ - Other Liquid; AIR - Air; SOL - Other Solid; WP - Wipe; ~~FB-Field Blank~~; EB-Equipment Blank; RB- Rinse Blank; TB-Trip Blank

Lab Sample #	Field ID / Point of Collection	MEOH/DI Vial #	Collection Date	Collection Time	Sampled by	Matrix	# of bottles	HCl	NaOH	HNO3	H2SO4	NONE	DI Water	MEOH	ENCORE	Total Chromium	Hexavalent Chromium	Trivalent Chromium	Antimony	Thallium	Vanadium	Nickel	LAB USE ONLY
12	SW-A17(0.0-0.5)		1/29/19	1050	CC	SO	1					1				X	X	X	X	X	X	X	
13	SW-A17(2.0-2.5)		1/29/19	1100	CC	SO	1					1				X	X	X	X	X	X	X	
14	BS-A20		1/29/19	1400	CC	SO	1					1				X	X	X	X	X	X	X	
	~~FOB-M018N~~		~~1/24/19~~		~~CC~~																		
	~~FOB-M018N~~		~~1/24/19~~		~~CC~~																		

Turnaround Time (Business days)

- [ ] Std. 10 Business Days
- [ ] 5 Day RUSH
- [ ] 3 Day RUSH
- [x] 2 Day RUSH
- [ ] 1 Day RUSH
- [ ] other

Emergency & Rush T/A data available via LabLink

Approved by (SGS Project Manager)/Date:

Data Deliverable Information

- [ ] Commercial "A" (Level 1)
- [ ] Commercial "B" (Level 2)
- [ ] FULLT1 (Level 3+4)
- [ ] NJ Reduced
- [ ] Commercial "C"
- [ ] NJ Data of Known Quality Protocol Reporting
- [ ] NYASP Category A
- [ ] NYASP Category B
- [ ] State Forms
- [x] EDD Format Equis
- [ ] Other

Commercial "A" = Results Only; Commercial "B" = Results + QC Summary
NJ Reduced = Results + QC Summary + Partial Raw data

Comments / Special Instructions

Sample inventory is verified upon receipt in the Laboratory

Sample Custody must be documented below each time samples change possession, including courier delivery.

	Relinquished by Sampler:	Date Time:	Received By:	Relinquished By:	Date Time:	Received By:
1		1/29/11 1410	1 Robert Saunders	2 Robert Saunders	1-29-19 1503	2
3	Relinquished by Sampler:	Date Time:	Received By: 3	Relinquished By: 4	Date Time:	Received By: 4
5	Relinquished by:	Date Time:	Received By: 5	Custody Seal # 105-18 ☐ Intact ☐ Not intact	Preserved where applicable ☐	On Ice ☒ Cooler Temp. 3.1c

Report of Analysis

Client Sample ID:	FB(20190129)		
Lab Sample ID:	JC81985-1	**Date Sampled:**	01/29/19
Matrix:	AQ - Field Blank Soil	**Date Received:**	01/29/19
		Percent Solids:	n/a
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	< 0.010	0.010	mg/l	1	01/29/19 19:57	LS	SW846 7196A
Redox Potential Vs H2	324		mv	1	01/30/19 12:15	RI	ASTM D1498-76
pH [a]	5.63		su	1	01/29/19 16:26	HM	SM4500H+ B-11

(a) Sample received out of holding time for pH analysis.

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A12(0.0-0.5)		
Lab Sample ID:	JC81985-2	**Date Sampled:**	01/29/19
Matrix:	SO - Soil	**Date Received:**	01/29/19
		Percent Solids:	81.6
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	0.62 J-	0.49	mg/kg	1	01/31/19 14:57	DC	SW846 3060A/7196A
Redox Potential Vs H2	302		mv	1	01/30/19 15:12	RI	ASTM D1498-76M
Solids, Percent	81.6		%	1	01/30/19 17:16	BG	SM2540 G 18TH ED MOD
pH	7.66		su	1	01/30/19 14:49	RI	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A12(1.0-1.5)		
Lab Sample ID:	JC81985-3	**Date Sampled:**	01/29/19
Matrix:	SO - Soil	**Date Received:**	01/29/19
		Percent Solids:	64.7
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	1.6 J-	0.62	mg/kg	1	01/31/19 14:57	DC	SW846 3060A/7196A
Redox Potential Vs H2	286		mv	1	01/30/19 15:19	RI	ASTM D1498-76M
Solids, Percent	64.7		%	1	01/30/19 17:16	BG	SM2540 G 18TH ED MOD
pH	7.42		su	1	01/30/19 14:53	RI	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A13(0.0-0.5)		
Lab Sample ID:	JC81985-4	**Date Sampled:**	01/29/19
Matrix:	SO - Soil	**Date Received:**	01/29/19
		Percent Solids:	80.4
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	1.1 J-	0.50	mg/kg	1	01/31/19 14:57	DC	SW846 3060A/7196A
Redox Potential Vs H2	282		mv	1	01/30/19 15:25	RI	ASTM D1498-76M
Solids, Percent	80.4		%	1	01/30/19 17:16	BG	SM2540 G 18TH ED MOD
pH	7.19		su	1	01/30/19 14:56	RI	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A13(2.0-2.5)		
Lab Sample ID:	JC81985-5	**Date Sampled:**	01/29/19
Matrix:	SO - Soil	**Date Received:**	01/29/19
		Percent Solids:	85.7
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	0.47 J-	0.47	mg/kg	1	01/31/19 14:57	DC	SW846 3060A/7196A
Redox Potential Vs H2	275		mv	1	01/30/19 15:28	RI	ASTM D1498-76M
Solids, Percent	85.7		%	1	01/30/19 17:16	BG	SM2540 G 18TH ED MOD
pH	8.51		su	1	01/30/19 15:00	RI	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A14(0.0-0.5)		
Lab Sample ID:	JC81985-6	**Date Sampled:**	01/29/19
Matrix:	SO - Soil	**Date Received:**	01/29/19
		Percent Solids:	79.9
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	0.94 J-	0.50	mg/kg	1	01/31/19 14:57	DC	SW846 3060A/7196A
Redox Potential Vs H2	274		mv	1	01/30/19 15:30	RI	ASTM D1498-76M
Solids, Percent	79.9		%	1	01/30/19 17:16	BG	SM2540 G 18TH ED MOD
pH	7.33		su	1	01/30/19 15:04	RI	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A14(2.0-2.5)		
Lab Sample ID:	JC81985-7	**Date Sampled:**	01/29/19
Matrix:	SO - Soil	**Date Received:**	01/29/19
		Percent Solids:	89.9
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	< 0.44 UJ-	0.44	mg/kg	1	01/31/19 14:57	DC	SW846 3060A/7196A
Redox Potential Vs H2	272		mv	1	01/30/19 15:33	RI	ASTM D1498-76M
Solids, Percent	89.9		%	1	01/30/19 17:16	BG	SM2540 G 18TH ED MOD
pH	8.69		su	1	01/30/19 15:11	RI	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A15(0.0-0.5)		
Lab Sample ID:	JC81985-8	**Date Sampled:**	01/29/19
Matrix:	SO - Soil	**Date Received:**	01/29/19
		Percent Solids:	81.7
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	0.98 J-	0.49	mg/kg	1	01/31/19 14:57	DC	SW846 3060A/7196A
Redox Potential Vs H2	271		mv	1	01/30/19 15:37	RI	ASTM D1498-76M
Solids, Percent	81.7		%	1	01/30/19 17:16	BG	SM2540 G 18TH ED MOD
pH	7.41		su	1	01/30/19 15:14	RI	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A15(2.0-2.5)		
Lab Sample ID:	JC81985-9	**Date Sampled:**	01/29/19
Matrix:	SO - Soil	**Date Received:**	01/29/19
		Percent Solids:	78.2
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	1.3 J-	0.51	mg/kg	1	01/31/19 14:57	DC	SW846 3060A/7196A
Redox Potential Vs H2	267		mv	1	01/30/19 15:39	RI	ASTM D1498-76M
Solids, Percent	78.2		%	1	01/30/19 17:16	BG	SM2540 G 18TH ED MOD
pH	7.40		su	1	01/30/19 15:17	RI	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A16(0.0-0.5)		
Lab Sample ID:	JC81985-10	**Date Sampled:**	01/29/19
Matrix:	SO - Soil	**Date Received:**	01/29/19
		Percent Solids:	80.7
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	0.90 J-	0.50	mg/kg	1	01/31/19 14:49	DC	SW846 3060A/7196A
Redox Potential Vs H2	267		mv	1	01/30/19 15:41	RI	ASTM D1498-76M
Solids, Percent	80.7		%	1	01/30/19 17:16	BG	SM2540 G 18TH ED MOD
pH	6.86		su	1	01/30/19 15:19	RI	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A16(2.0-2.5)		
Lab Sample ID:	JC81985-11	**Date Sampled:**	01/29/19
Matrix:	SO - Soil	**Date Received:**	01/29/19
		Percent Solids:	74.1
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	2.2 J-	0.54	mg/kg	1	01/31/19 14:57	DC	SW846 3060A/7196A
Redox Potential Vs H2	299		mv	1	01/30/19 15:48	RI	ASTM D1498-76M
Solids, Percent	74.1		%	1	01/30/19 17:16	BG	SM2540 G 18TH ED MOD
pH	8.05		su	1	01/30/19 15:32	RI	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A17(0.0-0.5)		
Lab Sample ID:	JC81985-12	**Date Sampled:**	01/29/19
Matrix:	SO - Soil	**Date Received:**	01/29/19
		Percent Solids:	82.3
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	5.5 J-	0.49	mg/kg	1	01/31/19 14:57	DC	SW846 3060A/7196A
Redox Potential Vs H2	308		mv	1	01/30/19 15:50	RI	ASTM D1498-76M
Solids, Percent	82.3		%	1	01/30/19 17:16	BG	SM2540 G 18TH ED MOD
pH	7.54		su	1	01/30/19 15:34	RI	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A17(2.0-2.5)		
Lab Sample ID:	JC81985-13	**Date Sampled:**	01/29/19
Matrix:	SO - Soil	**Date Received:**	01/29/19
		Percent Solids:	80.8
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	6.6 J-	0.50	mg/kg	1	01/31/19 14:59	DC	SW846 3060A/7196A
Redox Potential Vs H2	308		mv	1	01/30/19 15:56	RI	ASTM D1498-76M
Solids, Percent	80.8		%	1	01/30/19 17:16	BG	SM2540 G 18TH ED MOD
pH	8.02		su	1	01/30/19 15:37	RI	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-A20		
Lab Sample ID:	JC81985-14	**Date Sampled:**	01/29/19
Matrix:	SO - Soil	**Date Received:**	01/29/19
		Percent Solids:	87.2
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	2.3 J-	0.46	mg/kg	1	01/31/19 14:59	DC	SW846 3060A/7196A
Redox Potential Vs H2	314		mv	1	01/30/19 16:02	RI	ASTM D1498-76M
Solids, Percent	87.2		%	1	01/30/19 17:16	BG	SM2540 G 18TH ED MOD
pH	8.08		su	1	01/30/19 15:39	RI	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A12(0.0-0.5)		
Lab Sample ID:	JC81985-2R	**Date Sampled:**	01/29/19
Matrix:	SO - Soil	**Date Received:**	01/29/19
		Percent Solids:	81.6
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	< 0.49	0.49	mg/kg	1	02/05/19 12:24	RI	SW846 3060A/7196A

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A12(1.0-1.5)		
Lab Sample ID:	JC81985-3R	**Date Sampled:**	01/29/19
Matrix:	SO - Soil	**Date Received:**	01/29/19
		Percent Solids:	64.7
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	< 0.62	0.62	mg/kg	1	02/05/19 12:24	RI	SW846 3060A/7196A

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A13(0.0-0.5)		
Lab Sample ID:	JC81985-4R	**Date Sampled:**	01/29/19
Matrix:	SO - Soil	**Date Received:**	01/29/19
		Percent Solids:	80.4
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	< 0.50	0.50	mg/kg	1	02/05/19 12:24	RI	SW846 3060A/7196A

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A13(2.0-2.5)		
Lab Sample ID:	JC81985-5R	**Date Sampled:**	01/29/19
Matrix:	SO - Soil	**Date Received:**	01/29/19
		Percent Solids:	85.7
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	0.55	0.47	mg/kg	1	02/05/19 12:24	RI	SW846 3060A/7196A

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A14(0.0-0.5)		
Lab Sample ID:	JC81985-6R	**Date Sampled:**	01/29/19
Matrix:	SO - Soil	**Date Received:**	01/29/19
		Percent Solids:	79.9
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	1.8	0.50	mg/kg	1	02/05/19 12:24	RI	SW846 3060A/7196A

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A14(2.0-2.5)		
Lab Sample ID:	JC81985-7R	**Date Sampled:**	01/29/19
Matrix:	SO - Soil	**Date Received:**	01/29/19
		Percent Solids:	89.9
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	< 0.44	0.44	mg/kg	1	02/05/19 12:24	RI	SW846 3060A/7196A

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A15(0.0-0.5)		
Lab Sample ID:	JC81985-8R	**Date Sampled:**	01/29/19
Matrix:	SO - Soil	**Date Received:**	01/29/19
		Percent Solids:	81.7
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	6.1	0.49	mg/kg	1	02/05/19 12:24	RI	SW846 3060A/7196A

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A15(2.0-2.5)		
Lab Sample ID:	JC81985-9R	**Date Sampled:**	01/29/19
Matrix:	SO - Soil	**Date Received:**	01/29/19
		Percent Solids:	78.2
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	0.59	0.51	mg/kg	1	02/05/19 12:24	RI	SW846 3060A/7196A

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A16(0.0-0.5)		
Lab Sample ID:	JC81985-10R	**Date Sampled:**	01/29/19
Matrix:	SO - Soil	**Date Received:**	01/29/19
		Percent Solids:	80.7
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	< 0.50	0.50	mg/kg	1	02/05/19 12:17	RI	SW846 3060A/7196A

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A16(0.0-0.5)		
Lab Sample ID:	JC81985-10RT	**Date Sampled:**	01/29/19
Matrix:	SO - Soil	**Date Received:**	01/29/19
		Percent Solids:	80.7
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Iron, Ferrous [a]	0.78 J	0.20	%	1	02/07/19 11:15	ST	ASTM D3872-86
Sulfide Screen [b]	NEGATIVE UJ			1	02/07/19 11:15	ST	SM4500S2- A-11
Total Organic Carbon	52400	120	mg/kg	1	02/07/19 17:46	JO	LLOYD KAHN 1988 MOD

(a) The ferrous iron test was analyzed after completion of Cr6 testing (outside of normal hold times for this parameter) in order to provide more information about the possible impact of the sample matrix on Cr6 recoveries.
(b) The sulfide screen test was analyzed after completion of Cr6 testing (outside of normal hold times for this parameter) in order to provide more information about the possible impact of the sample matrix on Cr6 recoveries.

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A16(2.0-2.5)		
Lab Sample ID:	JC81985-11R	**Date Sampled:**	01/29/19
Matrix:	SO - Soil	**Date Received:**	01/29/19
		Percent Solids:	74.1
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	12.4	0.54	mg/kg	1	02/05/19 12:24	RI	SW846 3060A/7196A

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A17(0.0-0.5)		
Lab Sample ID:	JC81985-12R	**Date Sampled:**	01/29/19
Matrix:	SO - Soil	**Date Received:**	01/29/19
		Percent Solids:	82.3
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	8.8	0.49	mg/kg	1	02/05/19 12:24	RI	SW846 3060A/7196A

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A17(2.0-2.5)		
Lab Sample ID:	JC81985-13R	**Date Sampled:**	01/29/19
Matrix:	SO - Soil	**Date Received:**	01/29/19
		Percent Solids:	80.8
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	5.0	0.50	mg/kg	1	02/05/19 12:26	RI	SW846 3060A/7196A

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-A20		
Lab Sample ID:	JC81985-14R	**Date Sampled:**	01/29/19
Matrix:	SO - Soil	**Date Received:**	01/29/19
		Percent Solids:	87.2
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	0.48	0.46	mg/kg	1	02/05/19 12:26	RI	SW846 3060A/7196A

RL = Reporting Limit

Report of Analysis

Client Sample ID: FB(20190129)
Lab Sample ID: JC81985-1A
Matrix: AQ - Field Blank Soil
Project: PPG Site 107, 18 Chapel Avenue, Jersey City, NJ

Date Sampled: 01/29/19
Date Received: 01/29/19
Percent Solids: n/a

Total Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 6.0	6.0	ug/l	1	01/30/19	01/30/19	PP	SW846 6010D [1]	SW846 3010A [2]
Chromium	< 10	10	ug/l	1	01/30/19	01/30/19	PP	SW846 6010D [1]	SW846 3010A [2]
Nickel	< 10	10	ug/l	1	01/30/19	01/30/19	PP	SW846 6010D [1]	SW846 3010A [2]
Thallium	< 10	10	ug/l	1	01/30/19	01/30/19	PP	SW846 6010D [1]	SW846 3010A [2]
Vanadium	< 50	50	ug/l	1	01/30/19	01/30/19	PP	SW846 6010D [1]	SW846 3010A [2]

(1) Instrument QC Batch: MA46062
(2) Prep QC Batch: MP12316

RL = Reporting Limit

Report of Analysis

Client Sample ID:	FB(20190129)		
Lab Sample ID:	JC81985-1A	**Date Sampled:**	01/29/19
Matrix:	AQ - Field Blank Soil	**Date Received:**	01/29/19
		Percent Solids:	n/a
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	< 0.020	0.020	mg/l	1	01/30/19 17:46	PP	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A12(0.0-0.5)		
Lab Sample ID:	JC81985-2A	**Date Sampled:**	01/29/19
Matrix:	SO - Soil	**Date Received:**	01/29/19
		Percent Solids:	81.6
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 2.6	2.6	mg/kg	1	01/30/19	01/30/19	PP	SW846 6010D [1]	SW846 3050B [2]
Chromium	364	1.3	mg/kg	1	01/30/19	01/30/19	PP	SW846 6010D [1]	SW846 3050B [2]
Nickel	58.8	5.1	mg/kg	1	01/30/19	01/30/19	PP	SW846 6010D [1]	SW846 3050B [2]
Thallium [a]	< 2.6	2.6	mg/kg	2	01/30/19	01/30/19	PP	SW846 6010D [1]	SW846 3050B [2]
Vanadium	65.2	6.4	mg/kg	1	01/30/19	01/30/19	PP	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA46062
(2) Prep QC Batch: MP12317

(a) Elevated detection limit due to dilution required for high interfering element.

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A12(0.0-0.5)		
Lab Sample ID:	JC81985-2A	**Date Sampled:**	01/29/19
Matrix:	SO - Soil	**Date Received:**	01/29/19
		Percent Solids:	81.6
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	363	1.8	mg/kg	1	01/31/19 14:57	DC	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A12(1.0-1.5)		
Lab Sample ID:	JC81985-3A	**Date Sampled:**	01/29/19
Matrix:	SO - Soil	**Date Received:**	01/29/19
		Percent Solids:	64.7
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 3.1	3.1	mg/kg	1	01/30/19	01/30/19	PP	SW846 6010D [1]	SW846 3050B [2]
Chromium	35.7	1.6	mg/kg	1	01/30/19	01/30/19	PP	SW846 6010D [1]	SW846 3050B [2]
Nickel	22.0	6.2	mg/kg	1	01/30/19	01/30/19	PP	SW846 6010D [1]	SW846 3050B [2]
Thallium	< 1.6	1.6	mg/kg	1	01/30/19	01/30/19	PP	SW846 6010D [1]	SW846 3050B [2]
Vanadium	43.9	7.8	mg/kg	1	01/30/19	01/30/19	PP	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA46062
(2) Prep QC Batch: MP12317

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A12(1.0-1.5)		
Lab Sample ID:	JC81985-3A	**Date Sampled:**	01/29/19
Matrix:	SO - Soil	**Date Received:**	01/29/19
		Percent Solids:	64.7
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	34.1	2.2	mg/kg	1	01/31/19 14:57	DC	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A13(0.0-0.5)		
Lab Sample ID:	JC81985-4A	**Date Sampled:**	01/29/19
Matrix:	SO - Soil	**Date Received:**	01/29/19
		Percent Solids:	80.4
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 2.6	2.6	mg/kg	1	01/30/19	01/30/19	PP	SW846 6010D [1]	SW846 3050B [2]
Chromium	24.0	1.3	mg/kg	1	01/30/19	01/30/19	PP	SW846 6010D [1]	SW846 3050B [2]
Nickel	16.5	5.1	mg/kg	1	01/30/19	01/30/19	PP	SW846 6010D [1]	SW846 3050B [2]
Thallium	< 1.3	1.3	mg/kg	1	01/30/19	01/30/19	PP	SW846 6010D [1]	SW846 3050B [2]
Vanadium	42.0	6.4	mg/kg	1	01/30/19	01/30/19	PP	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA46062
(2) Prep QC Batch: MP12317

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A13(0.0-0.5)		
Lab Sample ID:	JC81985-4A	**Date Sampled:**	01/29/19
Matrix:	SO - Soil	**Date Received:**	01/29/19
		Percent Solids:	80.4
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	22.9	1.8	mg/kg	1	01/31/19 14:57	DC	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A13(2.0-2.5)		
Lab Sample ID:	JC81985-5A	**Date Sampled:**	01/29/19
Matrix:	SO - Soil	**Date Received:**	01/29/19
		Percent Solids:	85.7
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 2.3	2.3	mg/kg	1	01/30/19	01/30/19	PP	SW846 6010D [1]	SW846 3050B [2]
Chromium	27.1	1.2	mg/kg	1	01/30/19	01/30/19	PP	SW846 6010D [1]	SW846 3050B [2]
Nickel	18.8	4.7	mg/kg	1	01/30/19	01/30/19	PP	SW846 6010D [1]	SW846 3050B [2]
Thallium	< 1.2	1.2	mg/kg	1	01/30/19	01/30/19	PP	SW846 6010D [1]	SW846 3050B [2]
Vanadium	30.9	5.8	mg/kg	1	01/30/19	01/30/19	PP	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA46062
(2) Prep QC Batch: MP12317

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A13(2.0-2.5)		
Lab Sample ID:	JC81985-5A	**Date Sampled:**	01/29/19
Matrix:	SO - Soil	**Date Received:**	01/29/19
		Percent Solids:	85.7
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	26.6	1.7	mg/kg	1	01/31/19 14:57	DC	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A14(0.0-0.5)		
Lab Sample ID:	JC81985-6A	**Date Sampled:**	01/29/19
Matrix:	SO - Soil	**Date Received:**	01/29/19
		Percent Solids:	79.9
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 2.6	2.6	mg/kg	1	01/30/19	01/30/19	PP	SW846 6010D [1]	SW846 3050B [2]
Chromium	60.3	1.3	mg/kg	1	01/30/19	01/30/19	PP	SW846 6010D [1]	SW846 3050B [2]
Nickel	25.4	5.2	mg/kg	1	01/30/19	01/30/19	PP	SW846 6010D [1]	SW846 3050B [2]
Thallium	< 1.3	1.3	mg/kg	1	01/30/19	01/30/19	PP	SW846 6010D [1]	SW846 3050B [2]
Vanadium	42.0	6.5	mg/kg	1	01/30/19	01/30/19	PP	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA46062
(2) Prep QC Batch: MP12317

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A14(0.0-0.5)		
Lab Sample ID:	JC81985-6A	**Date Sampled:**	01/29/19
Matrix:	SO - Soil	**Date Received:**	01/29/19
		Percent Solids:	79.9
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	59.4	1.8	mg/kg	1	01/31/19 14:57	DC	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID: SW-A14(2.0-2.5)
Lab Sample ID: JC81985-7A
Matrix: SO - Soil
Project: PPG Site 107, 18 Chapel Avenue, Jersey City, NJ

Date Sampled: 01/29/19
Date Received: 01/29/19
Percent Solids: 89.9

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 2.2	2.2	mg/kg	1	01/30/19	01/30/19	PP	SW846 6010D [1]	SW846 3050B [2]
Chromium	17.3	1.1	mg/kg	1	01/30/19	01/30/19	PP	SW846 6010D [1]	SW846 3050B [2]
Nickel	14.9	4.4	mg/kg	1	01/30/19	01/30/19	PP	SW846 6010D [1]	SW846 3050B [2]
Thallium	< 1.1	1.1	mg/kg	1	01/30/19	01/30/19	PP	SW846 6010D [1]	SW846 3050B [2]
Vanadium	23.2	5.5	mg/kg	1	01/30/19	01/30/19	PP	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA46062
(2) Prep QC Batch: MP12317

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A14(2.0-2.5)		
Lab Sample ID:	JC81985-7A	**Date Sampled:**	01/29/19
Matrix:	SO - Soil	**Date Received:**	01/29/19
		Percent Solids:	89.9
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	17.3	1.5	mg/kg	1	01/31/19 14:57	DC	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A15(0.0-0.5)		
Lab Sample ID:	JC81985-8A	**Date Sampled:**	01/29/19
Matrix:	SO - Soil	**Date Received:**	01/29/19
		Percent Solids:	81.7
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 2.4	2.4	mg/kg	1	01/30/19	01/30/19	PP	SW846 6010D [1]	SW846 3050B [2]
Chromium	58.5	1.2	mg/kg	1	01/30/19	01/30/19	PP	SW846 6010D [1]	SW846 3050B [2]
Nickel	29.7	4.8	mg/kg	1	01/30/19	01/30/19	PP	SW846 6010D [1]	SW846 3050B [2]
Thallium	< 1.2	1.2	mg/kg	1	01/30/19	01/30/19	PP	SW846 6010D [1]	SW846 3050B [2]
Vanadium	35.2	5.9	mg/kg	1	01/30/19	01/30/19	PP	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA46062
(2) Prep QC Batch: MP12317

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A15(0.0-0.5)		
Lab Sample ID:	JC81985-8A	**Date Sampled:**	01/29/19
Matrix:	SO - Soil	**Date Received:**	01/29/19
		Percent Solids:	81.7
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	57.5	1.7	mg/kg	1	01/31/19 14:57	DC	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A15(2.0-2.5)		
Lab Sample ID:	JC81985-9A	**Date Sampled:**	01/29/19
Matrix:	SO - Soil	**Date Received:**	01/29/19
		Percent Solids:	78.2
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 2.6	2.6	mg/kg	1	01/30/19	01/30/19	PP	SW846 6010D [1]	SW846 3050B [2]
Chromium	36.1	1.3	mg/kg	1	01/30/19	01/30/19	PP	SW846 6010D [1]	SW846 3050B [2]
Nickel	15.6	5.2	mg/kg	1	01/30/19	01/30/19	PP	SW846 6010D [1]	SW846 3050B [2]
Thallium	< 1.3	1.3	mg/kg	1	01/30/19	01/30/19	PP	SW846 6010D [1]	SW846 3050B [2]
Vanadium	41.0	6.5	mg/kg	1	01/30/19	01/30/19	PP	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA46062
(2) Prep QC Batch: MP12317

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A15(2.0-2.5)		
Lab Sample ID:	JC81985-9A	**Date Sampled:**	01/29/19
Matrix:	SO - Soil	**Date Received:**	01/29/19
		Percent Solids:	78.2
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	34.8	1.8	mg/kg	1	01/31/19 14:57	DC	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A16(0.0-0.5)		
Lab Sample ID:	JC81985-10A	**Date Sampled:**	01/29/19
Matrix:	SO - Soil	**Date Received:**	01/29/19
		Percent Solids:	80.7
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 2.6	2.6	mg/kg	1	01/30/19	01/30/19	PP	SW846 6010D [1]	SW846 3050B [2]
Chromium	43.3	1.3	mg/kg	1	01/30/19	01/30/19	PP	SW846 6010D [1]	SW846 3050B [2]
Nickel	37.7	5.1	mg/kg	1	01/30/19	01/30/19	PP	SW846 6010D [1]	SW846 3050B [2]
Thallium	< 1.3	1.3	mg/kg	1	01/30/19	01/30/19	PP	SW846 6010D [1]	SW846 3050B [2]
Vanadium	38.2	6.4	mg/kg	1	01/30/19	01/30/19	PP	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA46062
(2) Prep QC Batch: MP12317

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A16(0.0-0.5)		
Lab Sample ID:	JC81985-10A	**Date Sampled:**	01/29/19
Matrix:	SO - Soil	**Date Received:**	01/29/19
		Percent Solids:	80.7
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	42.4	1.8	mg/kg	1	01/31/19 14:49	DC	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A16(2.0-2.5)		
Lab Sample ID:	JC81985-11A	**Date Sampled:**	01/29/19
Matrix:	SO - Soil	**Date Received:**	01/29/19
		Percent Solids:	74.1
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 2.6	2.6	mg/kg	1	01/30/19	01/30/19	PP	SW846 6010D [1]	SW846 3050B [2]
Chromium	125	1.3	mg/kg	1	01/30/19	01/30/19	PP	SW846 6010D [1]	SW846 3050B [2]
Nickel	21.2	5.3	mg/kg	1	01/30/19	01/30/19	PP	SW846 6010D [1]	SW846 3050B [2]
Thallium	< 1.3	1.3	mg/kg	1	01/30/19	01/30/19	PP	SW846 6010D [1]	SW846 3050B [2]
Vanadium	46.7	6.6	mg/kg	1	01/30/19	01/30/19	PP	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA46062
(2) Prep QC Batch: MP12317

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A16(2.0-2.5)		
Lab Sample ID:	JC81985-11A	**Date Sampled:**	01/29/19
Matrix:	SO - Soil	**Date Received:**	01/29/19
		Percent Solids:	74.1
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	123	1.8	mg/kg	1	01/31/19 14:57	DC	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A17(0.0-0.5)		
Lab Sample ID:	JC81985-12A	**Date Sampled:**	01/29/19
Matrix:	SO - Soil	**Date Received:**	01/29/19
		Percent Solids:	82.3
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 2.5	2.5	mg/kg	1	01/30/19	01/30/19	PP	SW846 6010D [1]	SW846 3050B [2]
Chromium	180	1.2	mg/kg	1	01/30/19	01/30/19	PP	SW846 6010D [1]	SW846 3050B [2]
Nickel	15.7	4.9	mg/kg	1	01/30/19	01/30/19	PP	SW846 6010D [1]	SW846 3050B [2]
Thallium	< 1.2	1.2	mg/kg	1	01/30/19	01/30/19	PP	SW846 6010D [1]	SW846 3050B [2]
Vanadium	36.6	6.1	mg/kg	1	01/30/19	01/30/19	PP	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA46062
(2) Prep QC Batch: MP12317

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A17(0.0-0.5)		
Lab Sample ID:	JC81985-12A	**Date Sampled:**	01/29/19
Matrix:	SO - Soil	**Date Received:**	01/29/19
		Percent Solids:	82.3
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	175	1.7	mg/kg	1	01/31/19 14:57	DC	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A17(2.0-2.5)		
Lab Sample ID:	JC81985-13A	**Date Sampled:**	01/29/19
Matrix:	SO - Soil	**Date Received:**	01/29/19
		Percent Solids:	80.8
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 2.4	2.4	mg/kg	1	01/30/19	01/30/19	PP	SW846 6010D [1]	SW846 3050B [2]
Chromium	143	1.2	mg/kg	1	01/30/19	01/30/19	PP	SW846 6010D [1]	SW846 3050B [2]
Nickel	17.4	4.9	mg/kg	1	01/30/19	01/30/19	PP	SW846 6010D [1]	SW846 3050B [2]
Thallium	< 1.2	1.2	mg/kg	1	01/30/19	01/30/19	PP	SW846 6010D [1]	SW846 3050B [2]
Vanadium	29.9	6.1	mg/kg	1	01/30/19	01/30/19	PP	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA46062
(2) Prep QC Batch: MP12317

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A17(2.0-2.5)		
Lab Sample ID:	JC81985-13A	**Date Sampled:**	01/29/19
Matrix:	SO - Soil	**Date Received:**	01/29/19
		Percent Solids:	80.8
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	136	1.7	mg/kg	1	01/31/19 14:59	DC	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-A20		
Lab Sample ID:	JC81985-14A	**Date Sampled:**	01/29/19
Matrix:	SO - Soil	**Date Received:**	01/29/19
		Percent Solids:	87.2
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 2.2	2.2	mg/kg	1	01/30/19	01/30/19	PP	SW846 6010D [1]	SW846 3050B [2]
Chromium	29.2	1.1	mg/kg	1	01/30/19	01/30/19	PP	SW846 6010D [1]	SW846 3050B [2]
Nickel	15.6	4.4	mg/kg	1	01/30/19	01/30/19	PP	SW846 6010D [1]	SW846 3050B [2]
Thallium	< 1.1	1.1	mg/kg	1	01/30/19	01/30/19	PP	SW846 6010D [1]	SW846 3050B [2]
Vanadium	24.1	5.5	mg/kg	1	01/30/19	01/30/19	PP	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA46062
(2) Prep QC Batch: MP12317

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-A20		
Lab Sample ID:	JC81985-14A	**Date Sampled:**	01/29/19
Matrix:	SO - Soil	**Date Received:**	01/29/19
		Percent Solids:	87.2
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	26.9	1.6	mg/kg	1	01/31/19 14:59	DC	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

CHAIN OF CUSTODY

SGS North America Inc. - Dayton
2235 Route 130, Dayton, NJ 08810
TEL. 732-329-0200 FAX 732-329-3499
www.sgs.com/ehsusa

SO
PB

PAGE 1 OF 1

FED-EX Tracking #:
Bottle Order Control #: JC82063
SGS Quote #:
SGS Job #:

Client / Reporting Information

Company Name: Arcadis
Street Address: 10 Friends Lane Suite 200
City: Newtown State: PA Zip: 18940
Project Contact: Matt Bell E-mail:
Phone #: 646.762.5629 Fax #:
Sampler(s) Name(s): Christin Cefelli Phone #:

Project Information

Project Name: PPG Jersey City Site 107
Street: 18 Chapel Ave
City: Jersey City State: NJ
Project #: NP000770.0001.00008
Client Purchase Order #:
Project Manager: Jim McLaughlin

Billing Information (if different from Report to)

Company Name:
Street Address:
City: State: Zip:
Attention:

Requested Analysis (see TEST CODE sheet)

Matrix Codes: DW - Drinking Water; GW - Ground Water; WW - Water; SW - Surface Water; SO - Soil; SL- Sludge; SED-Sediment; OI - Oil; LIQ - Other Liquid; AIR - Air; SOL - Other Solid; WP - Wipe; FB-Field Blank; EB-Equipment Blank; RB- Rinse Blank; TB-Trip Blank

Lab Sample #	Field ID / Point of Collection	MEOH/DI Vial #	Collection Date	Collection Time	Sampled by	Matrix	# of bottles	Number of preserved bottles: HCl	NaOH	HNO3	H2SO4	NONE	DI Water	MEOH	ENCORE	Tot Chromium	Hexavalent Chromium	Trivalent Chromium	Antimony	Nickel	Thallium	Vanadium	LAB USE ONLY
1	FB(20190129)-108		1/29/19	1630	CB	FB	2			1		1				X	X	X	X	X	X	X	A24
2	BS-A3S BS-A3		1/29/19	1410	CB	SO	1					1				X	X	X	X	X	X	X	G26
3	BS-A3TT		1/29/19	1415	CB	SO	1					1				X	X	X	X	X	X	X	M26
4	108_M018N		1/29/19	1420	CB	SO	1					1				X	X	X	X	X	X	X	
5	108_M018N_1		1/29/19	1430	CB	SO	1					1				X	X	X	X	X	X	X	
6	BS-A4		1/29/19	1435	CB	SO	1					1				X	X	X	X	X	X	X	

Turnaround Time (Business days)

- [ ] Std. 10 Business Days
- [ ] 5 Day RUSH
- [ ] 3 Day RUSH
- [x] 2 Day RUSH
- [ ] 1 Day RUSH
- [ ] other

Emergency & Rush T/A data available via LabLink

Approved by (SGS Project Manager)/Date:

Data Deliverable Information

- [ ] Commercial "A" (Level 1)
- [ ] Commercial "B" (Level 2)
- [ ] FULLT1 (Level 3+4)
- [ ] NJ Reduced
- [ ] Commercial "C"
- [ ] NJ Data of Known Quality Protocol Reporting
- [ ] NYASP Category A
- [ ] NYASP Category B
- [ ] State Forms
- [x] EDD Format EQuIS
- [ ] Other

Commercial "A" = Results Only; Commercial "B" = Results + QC Summary
NJ Reduced = Results + QC Summary + Partial Raw data

Comments / Special Instructions

INITIAL ASSESSMENT 2A/JR
LABEL VERIFICATION JR
Sample inventory is verified upon receipt in the Laboratory

Sample Custody must be documented below each time samples change possession, including courier delivery.

Relinquished by Sampler:	Date Time: 1/30/19 12:10	Received By: 1 Robert Chambers	Relinquished By: 2 Robert Chambers	Date Time: 1-30-19 1430	Received By: 2
Relinquished by Sampler: 3	Date Time:	Received By: 3	Relinquished By: 4	Date Time:	Received By: 4
Relinquished by: 5	Date Time:	Received By: 5	Custody Seal # 13086	[ ] Intact [ ] Not Intact	Preserved where applicable [ ]

On Ice [x] Cooler Temp 3.1 °C

Form:SM088-03C (revised 2/12/18)

http://www.sgs.com/en/terms-and-conditions.

JC82063: Chain of Custody
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Report of Analysis

Client Sample ID:	FB (20190129)-108		
Lab Sample ID:	JC82063-1	**Date Sampled:**	01/29/19
Matrix:	AQ - Field Blank Soil	**Date Received:**	01/30/19
		Percent Solids:	n/a
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent [a]	< 0.010 UJ	0.010	mg/l	1	01/30/19 22:00	LS	SW846 7196A
Redox Potential Vs H2	348		mv	1	01/31/19 19:50	EB	ASTM D1498-76
pH [b]	5.84		su	1	01/30/19 17:44	HM	SM4500H+ B-11

(a) Analysis done out of holding time.
(b) Sample received out of holding time for pH analysis.

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-A3		
Lab Sample ID:	JC82063-2	**Date Sampled:**	01/29/19
Matrix:	SO - Soil	**Date Received:**	01/30/19
		Percent Solids:	90.1
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
~~Chromium, Hexavalent~~	~~1.6~~	~~0.44~~	~~mg/kg~~	~~1~~	~~02/01/19 10:15~~	~~RI~~	~~SW846 3060A/7196A~~
Redox Potential Vs H2	274		mv	1	01/31/19 15:16	RI	ASTM D1498-76M
Solids, Percent	90.1		%	1	01/31/19 15:00	RC	SM2540 G 18TH ED MOD
pH	8.58 J		su	1	01/31/19 15:02	RI	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-A3TT		
Lab Sample ID:	JC82063-3	**Date Sampled:**	01/29/19
Matrix:	SO - Soil	**Date Received:**	01/30/19
		Percent Solids:	89.8
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
~~Chromium, Hexavalent~~	~~6.0~~	~~0.45~~	~~mg/kg~~	~~1~~	~~02/01/19 10:18~~	~~RI~~	~~SW846 3060A/7196A~~
Redox Potential Vs H2	271		mv	1	01/31/19 15:18	RI	ASTM D1498-76M
Solids, Percent	89.8		%	1	01/31/19 15:00	RC	SM2540 G 18TH ED MOD
pH	8.82 J		su	1	01/31/19 15:04	RI	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID:	108_M018N		
Lab Sample ID:	JC82063-4	**Date Sampled:**	01/29/19
Matrix:	SO - Soil	**Date Received:**	01/30/19
		Percent Solids:	88.8
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
~~Chromium, Hexavalent~~	~~4.2~~	~~0.45~~	~~mg/kg~~	~~1~~	~~02/01/19 10:18~~	~~RI~~	~~SW846 3060A/7196A~~
Redox Potential Vs H2	272		mv	1	01/31/19 15:19	RI	ASTM D1498-76M
Solids, Percent	88.8		%	1	01/31/19 15:00	RC	SM2540 G 18TH ED MOD
pH	8.50 J		su	1	01/31/19 15:06	RI	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID:	108_M018N_1		
Lab Sample ID:	JC82063-5	**Date Sampled:**	01/29/19
Matrix:	SO - Soil	**Date Received:**	01/30/19
		Percent Solids:	88.5
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
~~Chromium, Hexavalent~~	~~3.5~~	~~0.45~~	~~mg/kg~~	~~1~~	~~02/01/19 10:18~~	~~RI~~	~~SW846 3060A/7196A~~
Redox Potential Vs H2	281		mv	1	01/31/19 15:27	RI	ASTM D1498-76M
Solids, Percent	88.5		%	1	01/31/19 15:00	RC	SM2540 G 18TH ED MOD
pH	8.06 J		su	1	01/31/19 15:16	RI	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-A4		
Lab Sample ID:	JC82063-6	**Date Sampled:**	01/29/19
Matrix:	SO - Soil	**Date Received:**	01/30/19
		Percent Solids:	90.4
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
~~Chromium, Hexavalent~~	~~0.61~~	~~0.44~~	~~mg/kg~~	~~1~~	~~02/01/19 10:18~~	~~RI~~	~~SW846 3060A/7196A~~
Redox Potential Vs H2	273		mv	1	01/31/19 15:29	RI	ASTM D1498-76M
Solids, Percent	90.4		%	1	01/31/19 15:00	RC	SM2540 G 18TH ED MOD
pH	8.44 J		su	1	01/31/19 15:18	RI	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-A3		
Lab Sample ID:	JC82063-2R	**Date Sampled:**	01/29/19
Matrix:	SO - Soil	**Date Received:**	01/30/19
		Percent Solids:	90.1
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	1.8	0.44	mg/kg	1	02/04/19 15:24	RI	SW846 3060A/7196A

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-A3TT		
Lab Sample ID:	JC82063-3R	**Date Sampled:**	01/29/19
Matrix:	SO - Soil	**Date Received:**	01/30/19
		Percent Solids:	89.8
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	9.9	0.45	mg/kg	1	02/04/19 15:27	RI	SW846 3060A/7196A

RL = Reporting Limit

Report of Analysis

Client Sample ID:	108_M018N		
Lab Sample ID:	JC82063-4R	**Date Sampled:**	01/29/19
Matrix:	SO - Soil	**Date Received:**	01/30/19
		Percent Solids:	88.8
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	3.2	0.45	mg/kg	1	02/04/19 15:27	RI	SW846 3060A/7196A

RL = Reporting Limit

Report of Analysis

Client Sample ID:	108_M018N_1		
Lab Sample ID:	JC82063-5R	**Date Sampled:**	01/29/19
Matrix:	SO - Soil	**Date Received:**	01/30/19
		Percent Solids:	88.5
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	2.2	0.45	mg/kg	1	02/04/19 15:27	RI	SW846 3060A/7196A

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-A4		
Lab Sample ID:	JC82063-6R	**Date Sampled:**	01/29/19
Matrix:	SO - Soil	**Date Received:**	01/30/19
		Percent Solids:	90.4
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	< 0.44	0.44	mg/kg	1	02/04/19 15:27	RI	SW846 3060A/7196A

RL = Reporting Limit

Report of Analysis

Client Sample ID: FB (20190129)-108
Lab Sample ID: JC82063-1A
Matrix: AQ - Field Blank Soil
Project: PPG Site 107, 18 Chapel Avenue, Jersey City, NJ

Date Sampled: 01/29/19
Date Received: 01/30/19
Percent Solids: n/a

Total Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 6.0	6.0	ug/l	1	01/31/19	01/31/19	GT	SW846 6010D [1]	SW846 3010A [2]
Chromium	< 10	10	ug/l	1	01/31/19	01/31/19	GT	SW846 6010D [1]	SW846 3010A [2]
Nickel	< 10	10	ug/l	1	01/31/19	01/31/19	GT	SW846 6010D [1]	SW846 3010A [2]
Thallium	< 10	10	ug/l	1	01/31/19	01/31/19	GT	SW846 6010D [1]	SW846 3010A [2]
Vanadium	< 50	50	ug/l	1	01/31/19	01/31/19	GT	SW846 6010D [1]	SW846 3010A [2]

(1) Instrument QC Batch: MA46067
(2) Prep QC Batch: MP12330

RL = Reporting Limit

Report of Analysis

Client Sample ID:	FB (20190129)-108		
Lab Sample ID:	JC82063-1A	**Date Sampled:**	01/29/19
Matrix:	AQ - Field Blank Soil	**Date Received:**	01/30/19
		Percent Solids:	n/a
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	< 0.020	0.020	mg/l	1	01/31/19 19:10	GT	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-A3		
Lab Sample ID:	JC82063-2A	**Date Sampled:**	01/29/19
Matrix:	SO - Soil	**Date Received:**	01/30/19
		Percent Solids:	90.1
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 2.2	2.2	mg/kg	1	01/31/19	01/31/19	GT	SW846 6010D [1]	SW846 3050B [2]
Chromium	28.3	1.1	mg/kg	1	01/31/19	01/31/19	GT	SW846 6010D [1]	SW846 3050B [2]
Nickel	14.7	4.4	mg/kg	1	01/31/19	01/31/19	GT	SW846 6010D [1]	SW846 3050B [2]
Thallium	< 1.1	1.1	mg/kg	1	01/31/19	01/31/19	GT	SW846 6010D [1]	SW846 3050B [2]
Vanadium	24.2	5.5	mg/kg	1	01/31/19	01/31/19	GT	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA46067
(2) Prep QC Batch: MP12331

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-A3		
Lab Sample ID:	JC82063-2A	**Date Sampled:**	01/29/19
Matrix:	SO - Soil	**Date Received:**	01/30/19
		Percent Solids:	90.1
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	~~26.7~~ 26.5	1.5	mg/kg	1	02/01/19 10:15	RI	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-A3TT		
Lab Sample ID:	JC82063-3A	**Date Sampled:**	01/29/19
Matrix:	SO - Soil	**Date Received:**	01/30/19
		Percent Solids:	89.8
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 2.3	2.3	mg/kg	1	01/31/19	01/31/19	GT	SW846 6010D [1]	SW846 3050B [2]
Chromium	75.8	1.1	mg/kg	1	01/31/19	01/31/19	GT	SW846 6010D [1]	SW846 3050B [2]
Nickel	15.0	4.6	mg/kg	1	01/31/19	01/31/19	GT	SW846 6010D [1]	SW846 3050B [2]
Thallium	< 1.1	1.1	mg/kg	1	01/31/19	01/31/19	GT	SW846 6010D [1]	SW846 3050B [2]
Vanadium	23.1	5.7	mg/kg	1	01/31/19	01/31/19	GT	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA46067
(2) Prep QC Batch: MP12331

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-A3TT		
Lab Sample ID:	JC82063-3A	**Date Sampled:**	01/29/19
Matrix:	SO - Soil	**Date Received:**	01/30/19
		Percent Solids:	89.8
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	~~69.8~~ 65.9	1.6	mg/kg	1	02/01/19 10:18	RI	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID: 108_M018N
Lab Sample ID: JC82063-4A
Matrix: SO - Soil
Project: PPG Site 107, 18 Chapel Avenue, Jersey City, NJ

Date Sampled: 01/29/19
Date Received: 01/30/19
Percent Solids: 88.8

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 2.3	2.3	mg/kg	1	01/31/19	01/31/19	GT	SW846 6010D [1]	SW846 3050B [2]
Chromium	49.0	1.1	mg/kg	1	01/31/19	01/31/19	GT	SW846 6010D [1]	SW846 3050B [2]
Nickel	13.5	4.5	mg/kg	1	01/31/19	01/31/19	GT	SW846 6010D [1]	SW846 3050B [2]
Thallium	< 1.1	1.1	mg/kg	1	01/31/19	01/31/19	GT	SW846 6010D [1]	SW846 3050B [2]
Vanadium	23.3	5.6	mg/kg	1	01/31/19	01/31/19	GT	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA46067
(2) Prep QC Batch: MP12331

RL = Reporting Limit

Report of Analysis

Client Sample ID:	108_M018N		
Lab Sample ID:	JC82063-4A	**Date Sampled:**	01/29/19
Matrix:	SO - Soil	**Date Received:**	01/30/19
		Percent Solids:	88.8
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	~~44.8~~ 45.8	1.6	mg/kg	1	02/01/19 10:18	RI	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	108_M018N_1		
Lab Sample ID:	JC82063-5A	**Date Sampled:**	01/29/19
Matrix:	SO - Soil	**Date Received:**	01/30/19
		Percent Solids:	88.5
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 2.3	2.3	mg/kg	1	01/31/19	01/31/19	GT	SW846 6010D [1]	SW846 3050B [2]
Chromium	60.7	1.1	mg/kg	1	01/31/19	01/31/19	GT	SW846 6010D [1]	SW846 3050B [2]
Nickel	15.1	4.5	mg/kg	1	01/31/19	01/31/19	GT	SW846 6010D [1]	SW846 3050B [2]
Thallium	< 1.1	1.1	mg/kg	1	01/31/19	01/31/19	GT	SW846 6010D [1]	SW846 3050B [2]
Vanadium	23.2	5.6	mg/kg	1	01/31/19	01/31/19	GT	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA46067
(2) Prep QC Batch: MP12331

RL = Reporting Limit

Report of Analysis

Client Sample ID:	108_M018N_1		
Lab Sample ID:	JC82063-5A	**Date Sampled:**	01/29/19
Matrix:	SO - Soil	**Date Received:**	01/30/19
		Percent Solids:	88.5
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	~~57.2~~ 58.5	1.6	mg/kg	1	02/01/19 10:18	RI	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-A4		
Lab Sample ID:	JC82063-6A	**Date Sampled:**	01/29/19
Matrix:	SO - Soil	**Date Received:**	01/30/19
		Percent Solids:	90.4
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 2.2	2.2	mg/kg	1	01/31/19	01/31/19	GT	SW846 6010D [1]	SW846 3050B [2]
Chromium	16.6	1.1	mg/kg	1	01/31/19	01/31/19	GT	SW846 6010D [1]	SW846 3050B [2]
Nickel	13.9	4.5	mg/kg	1	01/31/19	01/31/19	GT	SW846 6010D [1]	SW846 3050B [2]
Thallium	< 1.1	1.1	mg/kg	1	01/31/19	01/31/19	GT	SW846 6010D [1]	SW846 3050B [2]
Vanadium	19.2	5.6	mg/kg	1	01/31/19	01/31/19	GT	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA46067
(2) Prep QC Batch: MP12331

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-A4		
Lab Sample ID:	JC82063-6A	**Date Sampled:**	01/29/19
Matrix:	SO - Soil	**Date Received:**	01/30/19
		Percent Solids:	90.4
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	~~16.0~~ 16.6	1.5	mg/kg	1	02/01/19 10:18	RI	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

ARCADIS Design & Consultancy for natural and built assets

PPG Industries

DATA QUALITY ASSESSMENT

Site 107 Fashionland

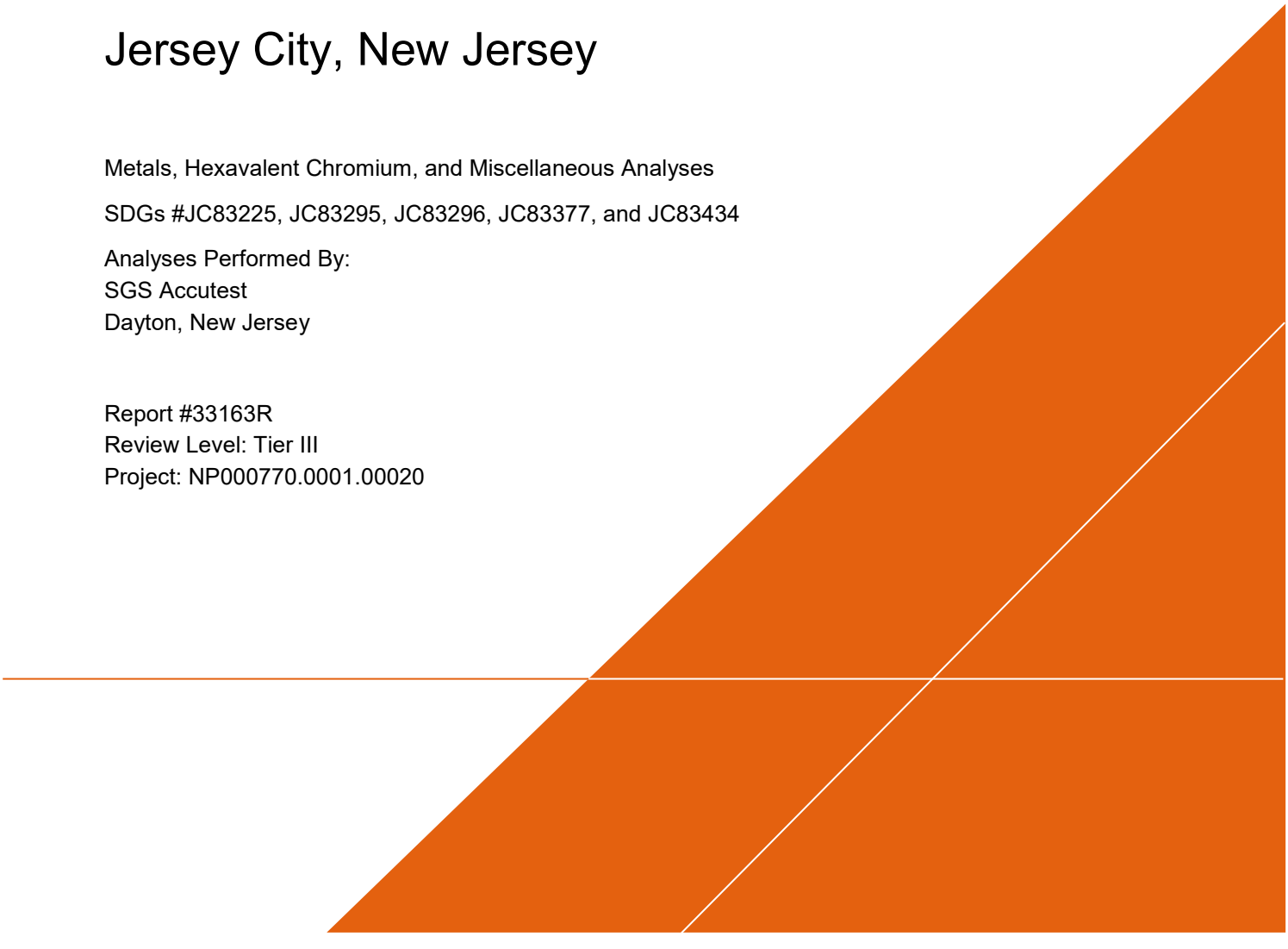
Jersey City, New Jersey

Metals, Hexavalent Chromium, and Miscellaneous Analyses

SDGs #JC83225, JC83295, JC83296, JC83377, and JC83434

Analyses Performed By:
SGS Accutest
Dayton, New Jersey

Report #33163R
Review Level: Tier III
Project: NP000770.0001.00020



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Groups (SDGs) # JC83225, JC83295, JC83296, JC83377, and JC83434 for samples collected in association with the PPG Industries Site 107 Fashionland, Jersey City, New Jersey Site. The review was conducted as a Tier III evaluation and included review of data package completeness. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

SDG	Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis		
						Cr VI	MET	MISC
JC83225	FB(20190220)	JC83225-1	Water	2/20/2019		X	X	X
	BS-A17I	JC83225-2	Soil	2/20/2019		X	X	X
JC83295	FB(20190222)	JC83295-1	Water	2/22/2019		X	X	X
	CS-G18	JC83295-2	Soil	2/22/2019		X	X	X
	BS-B17	JC83295-3	Soil	2/22/2019		X	X	X
	BS-C18	JC83295-4	Soil	2/22/2019		X	X	X
JC83296	FB(20190222)-A	JC83296-1	Water	2/22/2019		X	X	X
	SW-A24(0.0-0.5)	JC83296-2	Soil	2/22/2019		X	X	X
	SW-A24(2.0-2.5)	JC83296-3	Soil	2/22/2019		X	X	X
	SW-A25(0.0-0.5)	JC83296-4	Soil	2/22/2019		X	X	X
	SW-A25(2.0-2.5)	JC83296-5	Soil	2/22/2019		X	X	X
	SW-A26(0.0-0.5)	JC83296-6	Soil	2/22/2019		X	X	X
	SW-A26(2.0-2.5)	JC83296-7	Soil	2/22/2019		X	X	X
	DUP-03(20190222)RR	JC83296-8	Soil	2/22/2019	SW-A25(2.0-2.5)	X	X	X
JC83377	FB(20190225)	JC83377-1	Water	2/25/2019		X	X	X
	BS-B3	JC83377-2	Soil	2/25/2019		X	X	X
JC83434	FB(20190226)-A	JC83434-1	Water	2/26/2019		X	X	X
	SW-A27(0.0-0.5)	JC83434-2	Soil	2/26/2019		X	X	X
	SW-A27(2.0-2.5)	JC83434-3	Soil	2/26/2019		X	X	X
	SW-A28(0.0-0.5)	JC83434-4	Soil	2/26/2019		X	X	X
	SW-A28(2.0-2.5)	JC83434-5	Soil	2/26/2019		X	X	X
	SW-A29(0.0-0.5)	JC83434-6	Soil	2/26/2019		X	X	X
	SW-A29(2.0-2.5)	JC83434-7	Soil	2/26/2019		X	X	X
	DUP-04(20190226)RR	JC83434-8	Soil	2/26/2019	SW-A27(2.0-2.5)	X	X	X

Notes:

1. Metals include antimony, chromium, nickel, thallium, and vanadium. Trivalent chromium is reported by calculation (Chromium) – (Hexavalent Chromium).
2. Cr VI is hexavalent chromium.
3. Miscellaneous parameters include pH and redox potential.
4. SDGs #JC83225 and JC83295: Miscellaneous parameters for sample BS-A17I and CS-G18 also include ferrous iron, sulfide screen, and total organic carbon (TOC).

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of QA or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

Note:
QA - Quality Assurance

INORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Methods 6010C, 7196A, and 9045D; Standard Methods (SM) 4500H+B and SM4500S2-A; Lloyd Kahn; and ASTM D1498-76 and D3872-86. Data were reviewed in accordance with USEPA Region 2 SOP HW-2b, Revision 15 (December 2012); New Jersey Division of Remediation Management and Response Standard Operating Procedure for Analytical Data Validation of Hexavalent Chromium (September 2009); New Jersey Department of Environmental Protection Data Quality Assessment and Data Usability Evaluation Technical Guidance (April 2014); Field Sampling Plan/Quality Assurance Project Plan, PPG Non-Residential and Residential Chromium Sites, Hudson County, New Jersey (AECOM, June 2010); and Arcadis Quality Assurance Project Plan – Addendum, Site 107 Fashionland, Jersey City, New Jersey (Arcadis, June 2018).

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and that it was already subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with the USEPA National Functional Guidelines:

- Concentration (C) Qualifiers
  - U The analyte was analyzed for but not detected. The associated value is the analyte instrument detection limit.
  - B The reported value was obtained from a reading less than the reporting limit (RL), but greater than or equal to the method detection limit (MDL).
- Quantitation (Q) Qualifiers
  - E The reported value is estimated due to the presence of interference.
  - N Spiked sample recovery is not within control limits.
  - * Duplicate analysis is not within control limits.
- Validation Qualifiers
  - J The analyte was positively identified; however, the associated numerical value is an estimated concentration only.
  - J+ The result is an estimated quantity, but the result may be biased high.
  - J- The result is an estimated quantity, but the result may be biased low.
  - UJ The analyte was not detected above the reporting limit. However, the reported limit is approximate and may or may not represent the actual limit of detection.
  - UB Analyte considered non-detect at the listed value due to associated blank contamination.
  - R The data are unusable. The sample results are rejected due to serious deficiencies in meeting Quality Control (QC) critieria. The analyte may or may not be present in the sample.

Two facts should be noted by all data users. First, the “R” flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. “R” values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

METALS ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 6010C	Water	180 days from collection to analysis	Preserved to a pH of less than 2; Cool to <6°C
	Soil	180 days from collection to analysis	Cool to <6°C

All samples were analyzed within the specified holding times.

2. Blank Contamination

Quality assurance (QA) blanks (i.e., method and rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank is calculated for QA blanks containing concentrations greater than the method detection limit (MDL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Analytes were not detected above the MDL in the associated blanks; therefore, detected sample results were not associated with blank contamination.

3. Calibration

Satisfactory instrument calibration is established to provide that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument's continuing performance is satisfactory.

3.1 Initial Calibration and Continuing Calibration

The correct number and type of standards were analyzed. The correlation coefficient of the initial calibration was greater than 0.998 and all initial calibration verification standard and continuing calibration verification standard recoveries were within control limits of 90% to 110%.

All continuing calibration verification standard recoveries were within the control limit.

3.2 Low-Level Calibration Verification

The low-level initial and continuing calibration check standard serves to verify the linearity of calibration of the analysis at the reporting limit.

All RL standard recoveries were within control limits of 70% to 130% (50% to 150% for antimony and thallium).

3.3 ICP Interference Control Sample (ICS)

The ICS verifies the laboratories interelement and background correction factors.

All ICS exhibited recoveries within the control limits of 80% to 120%.

4. Matrix Spike/Matrix Spike Duplicate (MS/MSD)/Laboratory Duplicate Analysis

MS/MSD and laboratory duplicate data are used to assess the precision and accuracy of the analytical method.

4.1 MS/MSD Analysis

All metal analytes must exhibit a percent recovery within the established acceptance limits of 75% to 125%. The MS/MSD recovery control limits do not apply for MS/MSD performed on sample locations where the analyte's concentration detected in the parent sample exceeds the MS/MSD concentration by a factor of four or greater.

SDGs #JC83225, JC83295, and JC83377: The MS/MSD analysis was not performed using a sample from these SDGs.

SDGs #JC83296 and JC83434: The MS/MSD analysis performed on sample locations SW-A24(2.0-2.5) and SW-A28(2.0-2.5) exhibited recoveries within the control limits with the exception of the analytes presented in the table below.

Sample Location	Analyte	MS Recovery	MSD Recovery
SW-A24(2.0-2.5)	Antimony	AC (78.6%)	71.4%
	Chromium	< 30%	59.1%
SW-A28(2.0-2.5)	Antimony	69.6%	72.1%

Notes:

AC = Acceptable

The criteria used to evaluate MS/MSD recoveries are presented in the following table. In the case of an MS/MSD deviation, the sample results are qualified. The qualifications are applied to all sample results associated with the sample preparation batch.

Control limit	Sample Result	Qualification
MS/MSD percent recovery 30% to 74%	Non-detect	UJ-
	Detect	J-
MS/MSD percent recovery < 30%	Non-detect	R
	Detect	J-
MS/MSD percent recovery > 125%	Non-detect	No Action
	Detect	J+

4.2 Laboratory Duplicate Analysis

The laboratory duplicate relative percent difference (RPD) criterion is applied when parent and duplicate sample concentrations are greater than or equal to 5 times the RL. A control limit of 20% for water matrices and 35% for soil matrices is applied when the criteria above is true. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of ± the RL is applied.

SDGs #JC83225, JC83295, and JC83377: The laboratory duplicate analysis was not performed using a sample from these SDGs.

SDG #JC83434: MS/MSD analysis was performed in replacement of the laboratory duplicate analysis using sample SW-A28(2.0-2.5). The MS/MSD recoveries exhibited acceptable RPDs.

SDG #JC83296: MS/MSD analysis was performed in replacement of the laboratory duplicate analysis using sample SW-A24(2.0-2.5). The MS/MSD recoveries exhibited RPDs greater than the control limit as presented in the following table.

Sample Location	Analytes	MS/MSD RPD
SW-A24(2.0-2.5)	Chromium	42.3%

The criteria used to evaluate MS/MSD RPD are presented in the following table. In the case of a MS/MSD RPD deviation, the sample results are qualified. The qualifications are applied to the all sample results associated with this SDG.

Control Limit	Sample Result	Qualification
> 20% (water) or > 35% (soil)	Non-detect	UJ
	Detect	J

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 50% for soil matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of three times the RL is applied for soil matrices.

Results for duplicate samples are summarized in the following table.

Sample ID/Duplicate ID	Analyte	Sample Result	Duplicate Result	RPD
SW-A25(2.0-2.5) / DUP-03(20190222)RR	Antimony	3.7	2.7 U	AC
	Vanadium	38.5	33.0	
	Chromium	181	177	2.2%
	Trivalent Chromium	167	163	2.4%
	Nickel	34.5	28.8	18.0%

Sample ID/Duplicate ID	Analyte	Sample Result	Duplicate Result	RPD
SW-A27(2.0-2.5) / DUP-04(20190226)RR	Chromium	16.6	20.2	19.6%
	Trivalent Chromium	15.2	20.2	28.2%
	Nickel	14.3	12.1	AC
	Vanadium	23.5	22.8	

Notes:

AC = Acceptable

The differences in the results between the parent sample SW-A25(2.0-2.5) and field duplicate sample DUP-03(20190222)RR were acceptable.

The differences in the results between the parent sample SW-A27(2.0-2.5) and field duplicate sample DUP-04(20190226)RR were acceptable.

6. Laboratory Control Sample (LCS) Analysis

The LCS analysis is used to assess the accuracy of the analytical method independent of matrix interferences. The analytes associated with the LCS analysis must exhibit a percent recovery between the control limits of 80% and 120%.

The LCS analysis exhibited recoveries and RPDs within the control limits.

7. Serial Dilution

The serial dilution analysis is used to assess if a significant physical or chemical interference exists due to sample matrix. Analytes exhibiting concentrations greater than 10 times the RL in the undiluted sample are evaluated to determine if matrix interference exists. These analytes are required to have less than a 10% difference (%D) between sample results from the undiluted (parent) sample and results associated with the same sample analyzed with a five-fold dilution.

SDGs #JC83225, JC83295, and JC83377: The serial dilution analysis was not performed using a sample from these SDGs.

SDGs #JC83296 and JC83434: The serial dilution analysis performed using samples SW-A24(2.0-2.5) and SW-A28(2.0-2.5) exhibited %D within the control limits.

8. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR METALS

METALS: SW-846 6010C	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Inductively Coupled Plasma-Atomic Emission Spectrometry (ICP-AES)					
Tier II Validation					
Holding Times		X		X	
Reporting limits (units)		X		X	
Blanks					
A. Instrument Blanks		X		X	
B. Method Blanks		X		X	
C. Equipment/Field Blanks		X		X	
Laboratory Control Sample (LCS)		X		X	
Laboratory Control Sample Duplicate (LCSD)	X				X
LCS/LCSD Precision (RPD)	X				X
Matrix Spike (MS) %R		X	X		
Matrix Spike Duplicate (MSD) %R		X	X		
MS/MSD Precision (RPD)		X	X		
Field/Lab Duplicate (RPD)		X		X	
ICP Serial Dilution %D		X		X	
Total vs. Dissolved	X				X
Reporting Limit Verification		X		X	
Tier III Validation					
Initial Calibration Verification		X		X	
Continuing Calibration Verification		X		X	
CRDL Standard Recovery		X		X	
ICP Interference Check		X		X	
ICP-MS Internal Standards	X				X
Transcription/calculations acceptable		X		X	
Raw Data	X				X
Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%R Percent recovery

RPD Relative percent difference

%D Percent difference

HEXAVALENT CHROMIUM ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 7196A	Water	24 hours from collection to analysis	Cool to <6°C
SW-846 3060A/ 7196A	Soil	30 days from collection to extraction; 7 days from extraction to analysis	Cool to <6°C

The analyses that exceeded the holding are presented in the following table.

Sample Locations	Holding Time	Criteria
FB(20190220)	Analysis: 32 hours	< 24 hours of receipt by laboratory

Sample results were qualified as specified in the table below. All other holding times were met.

Criteria	Qualification	
	Detected Analytes	Non-detect Analytes
Analysis completed less than two times holding time	J	UJ

2. Blank Contamination

Quality assurance (QA) blanks (i.e., method and rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank is calculated for QA blanks containing concentrations greater than the method detection limit (MDL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Analytes were not detected above the MDL in the associated blanks; therefore, detected sample results were not associated with blank contamination.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

The correct number and type of standards were analyzed. The correlation coefficient of the initial calibration was greater than 0.995 and all calibration verification standard recoveries were within control limits of 90% to 110%.

4. Matrix Spike (MS)/Post-Digestion Spike (PDS)/Laboratory Duplicate Analysis

MS, PDS, and laboratory duplicate data are used to assess the precision and accuracy of the analytical method.

4.1 MS Analysis

Soluble and insoluble spike sample analyses are designed to provide information about the effect of the sample matrix on the digestion and measurement methodology. The insoluble spike is used to evaluate the dissolution during the digestion process. Hexavalent chromium must exhibit a percent recovery within the established acceptance limits of 75% to 125% in both the soluble and insoluble spiked analyses. The control limits do not apply when the parent sample concentration exceeds the spike amount by a factor of four or greater.

SDGs #JC83295, JC83296, JC83377, and JC83434: The MS analysis performed on sample locations CS-G18, SW-A24(2.0-2.5), BS-B3, SW-A28(2.0-2.5) in association with the insoluble hexavalent chromium analysis exhibited recoveries within the control limits.

SDGs #JC83225, JC83295, JC83296, JC83377, and JC83434: The MS analysis performed on sample locations BS-A17I, CS-G18, SW-A24(2.0-2.5), BS-B3, and SW-A28(2.0-2.5) exhibited spike recoveries less than the lower control limits as presented in the table below.

Sample Location	Analyte	Initial Spike Recovery	Reanalysis Spike Recovery
BS-A17I	Hexavalent Chromium, Soluble	< 50%	< 50%
	Hexavalent Chromium, Insoluble	72.1%	66.8%
CS-G18	Hexavalent Chromium, Soluble	58.2%	< 50%
SW-A24(2.0-2.5)	Hexavalent Chromium, Soluble	< 50%	AC (100.7%)
BS-B3	Hexavalent Chromium, Soluble	69.8%	AC (77.8%)
SW-A28(2.0-2.5)	Hexavalent Chromium, Soluble	< 50%	AC (95.0%)

Notes:

AC = Acceptable

The criteria used to evaluate spike recoveries are presented in the following table. The qualifications are applied to all sample results associated with the sample preparation batch. In the event of a recovery outside of the control limits, the MS must be reanalyzed.

Control limit	Sample Result	Qualification[1]
Spike recovery ≥ 50% but < 75%	Non-detect	UJ-
	Detect	J-
Spike recovery < 50%	Non-detect	R
	Detect	R
Spike recovery > 125%	Non-detect	No Action
Spike recovery > 125% but ≤ 150%	Detect	J+
Spike recovery > 150%	Detect	R

Notes:

[1] If recoveries are < 50% or > 150% for both insoluble and soluble spikes, associated data will be rejected ("R"); otherwise qualify associated data if one of the spikes is outside the < 50% or > 150% limits.

SDGs #JC83225, JC83295, JC83296, JC83377, and JC83434: The original analyses of the field samples are usable with appropriate qualification. No sample results were rejected. Note that the laboratory duplicate analyses results were outside of the acceptance limits in the reanalysis of SDGs #JC83296, JC83377, and JC83434, hence the original analyses of the field samples were marked as usable even though the MS recoveries were acceptable in the reanalyses.

4.2 Post-Digestion Spike (PDS) Analysis

The PDS analysis is designed to verify that neither a reducing condition nor a chemical interference is affecting the analysis. This is accomplished by analyzing a second aliquot of the pH-adjusted filtrate that has been spiked with hexavalent chromium. The PDS must exhibit a percent recovery within the method acceptance limits of 85% to 115%.

SDGs #JC83225, JC83295, JC83296, JC83377, and JC83434: The PDS analysis performed on sample location BS-A17I, CS-G18, SW-A24(2.0-2.5), BS-B3, and SW-A28(2.0-2.5) exhibited recoveries within the control limits.

4.3 Laboratory Duplicate Analysis

The laboratory duplicate relative percent difference (RPD) criterion is applied when parent and duplicate sample concentrations are greater than or equal to four times the RL. A control limit of 20% is applied when the criteria above is true. In the instance when the parent and/or duplicate sample concentrations are less than or equal to four times the RL, a control limit of ± the RL is used.

SDGs #JC83225, JC83295, JC83296, and JC83377: The laboratory duplicate analysis performed on sample locations BS-A17I, CS-G18, SW-A24(2.0-2.5), and BS-B3 exhibited results within the control limit.

SDG #JC83434: All analytes associated with laboratory duplicate were within the control limit, with the exception of the analytes presented in the following table.

Sample Location	Analytes	Laboratory Duplicate RPD
SW-A28(2.0-2.5)	Hexavalent Chromium	> ±RL

The criteria used to evaluate laboratory duplicate RPD are presented in the following table. In the case of a laboratory duplicate RPD deviation, the sample results are qualified. The qualifications are applied to all sample results associated with the sample preparation batch.

Sample Concentration	Control Limit	Sample Result	Qualification
Parent sample and/or laboratory duplicate sample result > four times the RL	> 20%	Non-detect	UJ
		Detect	J
Parent sample and/or laboratory duplicate sample result < four times the RL	± RL	Non-detect	UJ
		Detect	J

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 50% for soil matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of three times the RL is applied for soil matrices.

Results for duplicate samples are summarized in the following table.

Sample ID/Duplicate ID	Analyte	Sample Result	Duplicate Result	RPD
SW-A25(2.0-2.5) / DUP-03(20190222)RR	Hexavalent Chromium	14.0	14.0	0.0%
SW-A27(2.0-2.5) / DUP-04(20190226)RR	Hexavalent Chromium	1.4	0.47 U	AC

Notes:

AC = Acceptable

The differences in the results between the parent sample SW-A25(2.0-2.5) and field duplicate sample DUP-03(20190222)RR were acceptable.

The differences in the results between the parent sample SW-A27(2.0-2.5) and field duplicate sample DUP-04(20190226)RR were acceptable.

6. Laboratory Control Sample (LCS) Analysis

The LCS analysis is used to assess the precision and accuracy of the analytical method independent of matrix interferences. The analytes associated with the LCS analysis must exhibit a percent recovery between the control limits of 80% and 120%.

The LCS analysis exhibited recoveries within the control limits.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR HEXAVALENT CHROMIUM

HEXAVALENT CHROMIUM: SW-846 7196A	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Spectrophotometer					
Tier II Validation					
Holding Times		X	X		
Reporting limits (units)		X		X	
Blanks					
A. Instrument Blanks		X		X	
B. Method Blanks		X		X	
C. Equipment/Field Blanks		X		X	
Laboratory Control Sample (LCS)		X		X	
Matrix Spike (MS) %R		X	X		
Matrix Spike Duplicate (MSD) %R	X				X
MS/MSD Precision (RPD)	X				X
Post Digestion Spike %R		X		X	
Field/Lab Duplicate (RPD)		X	X		
Dilution Factor		X		X	
Tier III Validation					
Initial calibration %RSD or correlation coefficient		X		X	
Continuing calibration %R		X		X	
Raw Data		X		X	
Transcription/calculation errors present		X		X	
Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%R Percent recovery

RPD Relative percent difference

%RSD Relative percent deviation

GENERAL CHEMISTRY ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
pH by SM4500H+B	Water	QAPP: 24 hours of receipt at laboratory	Cool to <6°C
pH by SW846 9045D	Soil	QAPP: 24 hours of receipt at laboratory	Cool to <6°C
Oxidation-Reduction Potential by ASTM D1498-76	Water	Not applicable	Cool to <6°C
Oxidation-Reduction Potential (Redox) by ASTM D1498-76	Soil	Measure immediately after creating leachate	Cool to <6°C
Ferrous Iron by ASTM D3872-86	Soil	24 hours from collection to analysis	Cool to <6°C
Sulfide Screen by SM4500S2-A	Soil	7 days from collection to analysis	Cool to <6°C
Total Organic Carbon (TOC) by Lloyd Kahn	Soil	14 days from collection to analysis	Cool to <6°C

The analyses that exceeded the holding are presented in the following table.

Sample Locations	Method	Holding Time	Criteria
BS-A17I	SW846 9045D	Analysis: 2 days	< 24 hours of receipt by laboratory
CS-G18 BS-B17 BS-C18 SW-A24(0.0-0.5) SW-A24(2.0-2.5) SW-A25(0.0-0.5) SW-A25(2.0-2.5) SW-A26(0.0-0.5) SW-A26(2.0-2.5) DUP-03(20190222)RR		Analysis: 3 days	
BS-A17I	ASTM D3872-86	Analysis: 12 days	< 24 hours from collection
CS-G18		Analysis: 24 days	
BS-A17I	SM4500S2-A	Analysis: 12 days	< 7 days from collection
CS-G18		Analysis: 24 days	
CS-G18	Lloyd Kahn	Analysis: 25 days	< 14 days from collection

Sample results were qualified as specified in the table below. All other holding times were met.

Criteria	Qualification	
	Detected Analytes	Non-detect Analytes
Analysis completed less than two times holding time	J	UJ
Analysis completed greater than two times holding time	J	R

2. Blank Contamination

Quality assurance (QA) blanks (i.e., method and rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank is calculated for QA blanks containing concentrations greater than the method detection limit (MDL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Method blank analysis is not applicable for Redox and pH analyses.

SDG #JC83225: TOC was detected in the associated method blank; however, the associated sample results were greater than the BAL. No qualification of the sample results was required.

SDG #JC83295: Ferrous iron, sulfide, and TOC were not detected above the MDL in the associated blanks; therefore, detected sample results were not associated with blank contamination.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

The correct number and type of standards were analyzed. All buffer check results were within acceptance limits.

4. Laboratory Duplicate Analysis

Laboratory duplicate data are used to assess the precision of the analytical method. The laboratory duplicate relative percent difference (RPD) criterion is applied when parent and duplicate sample concentrations are greater than or equal to 5 times the RL. A control limit of 20% for water matrices and 35% for soil matrices is applied when the criteria above is true. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of ± the RL is applied.

SDGs #JC83225, JC83295, and JC83377: The laboratory duplicate analysis was not performed using a sample from these SDGs.

SDGs #JC83296 and JC83434: The laboratory duplicate analysis performed on sample locations SW-A24(2.0-2.5) and SW-A28(2.0-2.5) exhibited results within the control limit.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 50% for soil matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of three times the RL is applied for soil matrices.

Results for duplicate samples are summarized in the following table.

Sample ID/Duplicate ID	Analyte	Sample Result	Duplicate Result	RPD
SW-A25(2.0-2.5) / DUP-03(20190222)RR	Redox	412	458	10.6%
	pH	7.19	7.35	2.2%
SW-A27(2.0-2.5) / DUP-04(20190226)RR	Redox	354	322	9.5%
	pH	7.49	7.31	2.4%

The differences in the results between the parent sample SW-A25(2.0-2.5) and field duplicate sample DUP-03(20190222)RR were acceptable.

The differences in the results between the parent sample SW-A27(2.0-2.5) and field duplicate sample DUP-04(20190226)RR were acceptable.

6. Laboratory Control Sample (LCS) Analysis

The LCS analysis is used to assess the precision and accuracy of the analytical method independent of matrix interferences. The analytes associated with the LCS analysis must exhibit a percent recovery between the control limits of 80% and 120%.

LCS results for redox potential, pH, and sulfide screen were not reported in the analytical report.

The LCS analysis performed in association with ferrous iron and TOC exhibited recoveries within the control limits.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR GENERAL CHEMISTRY

General Chemistry: SM4500H+B, SW846 9045D, ASTM D1498-76	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Miscellaneous Instrumentation					
Tier II Validation					
Holding times		X	X		
Reporting limits (units)		X		X	
Blanks					
A. Instrument Blanks		X		X	
B. Method blanks		X		X	
C. Equipment blanks		X		X	
Laboratory Control Sample (LCS) %R		X		X	
Laboratory Control Sample Duplicate (LCSD) %R	X				X
LCS/LCSD Precision (RPD)	X				X
Matrix Spike (MS) %R	X				X
Matrix Spike Duplicate (MSD) %R	X				X
MS/MSD Precision (RPD)	X				X
Field/Lab Duplicate (RPD)		X		X	
Dilution Factor		X		X	
Tier III Validation					
Initial calibration %RSD or correlation coefficient	X				X
Continuing calibration %R	X				X
Raw Data		X		X	
Transcription/calculation errors present		X		X	
Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%R Percent recovery

RPD Relative percent difference

VALIDATION PERFORMED BY: Jennifer Singer

SIGNATURE: 

DATE: June 20, 2019

PEER REVIEW: Dennis Capria

DATE: July 12, 2019

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

SO
FB

CHAIN OF CUSTODY

SGS North America Inc. - Dayton
2235 Route 130, Dayton, NJ 08810
TEL. 732-329-0200 FAX 732-329-3499
www.sgs.com/ehsusa

PAGE 1 OF 1

E
PN

FED-EX Tracking #:
Bottle Order Control #: AK-011719-161
SGS Quote #:
SGS Job #: JC83225

Client / Reporting Information

Company Name: Arcadis
Street Address: 10 Friends Lane Suite 200
City: Newtown State: PA Zip: 18940
Project Contact: Matt Bell E-mail:
Phone #: Fax #:
Sampler(s) Name(s): Christin Cifelli Phone #: 201.264.8006
Project Manager: Jim McLaughlin

Project Information

Project Name: PPG Jersey City Site 107
Street: 18 Chapel Ave.
City: Jersey City State: NJ
Project #: NP000770.0003.
Client Purchase Order #:

Billing Information (If different from Report to)

Company Name:
Street Address:
City: State: Zip:
Attention:

Requested Analysis (see TEST CODE sheet)

Matrix Codes: DW - Drinking Water; GW - Ground Water; WW - Water; SW - Surface Water; SO - Soil; SL- Sludge; SED-Sediment; OI - Oil; LIQ - Other Liquid; AIR - Air; SOL - Other Solid; WP - Wipe; FB-Field Blank; EB-Equipment Blank; RB- Rinse Blank; TB-Trip Blank

Lab Sample #	Field ID / Point of Collection	MEOH/DI Vial #	Collection Date	Collection Time	Sampled by	Matrix	# of bottles	Number of preserved bottles: HCl	NaOH	HNO3	H2SO4	NONE	DI Water	MEOH	ENCORE	Total Chromium	Trivalent Chromium	Hexavalent Chromium	Antimony	Nickel	Thallium	Vanadium	LAB USE ONLY
1	FB(20190220)		2/20/19	1600	CC	FB	2			1		1				X	X	X	X	X	X	X	A39
2	BS-A17I		2/20/19	1315	CC	SO	1					1				X	X	X	X	X	X	X	G32
																							C22

Turnaround Time (Business days)

- [ ] Std. 10 Business Days
- [ ] 5 Day RUSH
- [ ] 3 Day RUSH
- [x] 2 Day RUSH
- [ ] 1 Day RUSH
- [ ] other

Emergency & Rush T/A data available via LabLink

Approved by (SGS Project Manager)/Date:

Data Deliverable Information

- [ ] Commercial "A" (Level 1)
- [ ] Commercial "B" (Level 2)
- [ ] FULLT1 (Level 3+4)
- [ ] NJ Reduced
- [ ] Commercial "C"
- [ ] NJ Data of Known Quality Protocol Reporting
- [ ] NYASP Category A
- [ ] NYASP Category B
- [ ] State Forms
- [x] EDD Format Equis
- [ ] Other

Commercial "A" = Results Only; Commercial "B" = Results + QC Summary
NJ Reduced = Results + QC Summary + Partial Raw data

Comments / Special Instructions

2A (N)
Initial Assessment
Label Verification

Sample inventory is verified upon receipt in the Laboratory

Sample Custody must be documented below each time samples change possession, including courier delivery.

	Relinquished by Sampler:	Date Time:	Received By:	Relinquished By:	Date Time:	Received By:
1		2/21/19 1235			2/21/19 1730	
2						
3						
4						
5						

Custody Seal # 31640 [x] Intact [ ] Not intact
Preserved where applicable [ ]
On Ice [x]
Cooler Temp 2.0°C-B

Form:SM088-03C (revised 2/12/18)

http://www.sgs.com/en/terms-and-conditions.

5.2
5

JC83225: Chain of Custody
Page 1 of 5

Report of Analysis

Client Sample ID:	FB(20190220)		
Lab Sample ID:	JC83225-1	**Date Sampled:**	02/20/19
Matrix:	AQ - Field Blank Soil	**Date Received:**	02/21/19
		Percent Solids:	n/a
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent [a]	< 0.010 UJ	0.010	mg/l	1	02/21/19 23:52	MO	SW846 7196A
Redox Potential Vs H2	392		mv	1	02/22/19 15:42	RI	ASTM D1498-76
pH [b]	5.60		su	1	02/21/19 18:04	SUB	SM4500H+ B-11

(a) Analysis done out of holding time.
(b) Sample received out of holding time for pH analysis.

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-A17I		
Lab Sample ID:	JC83225-2	**Date Sampled:**	02/20/19
Matrix:	SO - Soil	**Date Received:**	02/21/19
		Percent Solids:	59.5
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	0.91 J-	0.67	mg/kg	1	02/25/19 15:28	DC	SW846 3060A/7196A
Redox Potential Vs H2	174		mv	1	02/22/19 16:44	RI	ASTM D1498-76M
Solids, Percent	59.5		%	1	02/22/19 09:00	EB	SM2540 G 18TH ED MOD
pH	6.72 J		su	1	02/22/19 16:21	RI	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-A17I		
Lab Sample ID:	JC83225-2R	**Date Sampled:**	02/20/19
Matrix:	SO - Soil	**Date Received:**	02/21/19
		Percent Solids:	59.5
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	1.2	0.67	mg/kg	1	02/27/19 16:41	NV	SW846 3060A/7196A

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-A17I		
Lab Sample ID:	JC83225-2RT	**Date Sampled:**	02/20/19
Matrix:	SO - Soil	**Date Received:**	02/21/19
		Percent Solids:	59.5
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Iron, Ferrous [a]	1.4 J	0.20	%	1	03/04/19 12:00	MP	ASTM D3872-86
Sulfide Screen [b]	NEGATIVE UJ			1	03/04/19 12:00	MP	SM4500S2- A-11
Total Organic Carbon	19200	170	mg/kg	1	03/04/19 16:59	JO	LLOYD KAHN 1988 MOD

(a) The ferrous iron test was analyzed after completion of Cr6 testing (outside of normal hold times for this parameter) in order to provide more information about the possible impact of the sample matrix on Cr6 recoveries.
(b) The sulfide screen test was analyzed after completion of Cr6 testing (outside of normal hold times for this parameter) in order to provide more information about the possible impact of the sample matrix on Cr6 recoveries.

RL = Reporting Limit

Report of Analysis

Client Sample ID: FB(20190220)
Lab Sample ID: JC83225-1A
Matrix: AQ - Field Blank Soil
Project: PPG Site 107, 18 Chapel Avenue, Jersey City, NJ

Date Sampled: 02/20/19
Date Received: 02/21/19
Percent Solids: n/a

Total Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 6.0	6.0	ug/l	1	02/22/19	02/22/19	ND	SW846 6010D [1]	SW846 3010A [2]
Chromium	< 10	10	ug/l	1	02/22/19	02/22/19	ND	SW846 6010D [1]	SW846 3010A [2]
Nickel	< 10	10	ug/l	1	02/22/19	02/22/19	ND	SW846 6010D [1]	SW846 3010A [2]
Thallium	< 10	10	ug/l	1	02/22/19	02/22/19	ND	SW846 6010D [1]	SW846 3010A [2]
Vanadium	< 50	50	ug/l	1	02/22/19	02/22/19	ND	SW846 6010D [1]	SW846 3010A [2]

(1) Instrument QC Batch: MA46192
(2) Prep QC Batch: MP12696

RL = Reporting Limit

Report of Analysis

Client Sample ID:	FB(20190220)		
Lab Sample ID:	JC83225-1A	**Date Sampled:**	02/20/19
Matrix:	AQ - Field Blank Soil	**Date Received:**	02/21/19
		Percent Solids:	n/a
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	< 0.020	0.020	mg/l	1	02/22/19 18:20	ND	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-A17I		
Lab Sample ID:	JC83225-2A	**Date Sampled:**	02/20/19
Matrix:	SO - Soil	**Date Received:**	02/21/19
		Percent Solids:	59.5
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 3.4	3.4	mg/kg	1	02/21/19	02/22/19	ND	SW846 6010D [1]	SW846 3050B [3]
Chromium [a]	19.0	5.0	mg/kg	3	02/21/19	02/25/19	ND	SW846 6010D [2]	SW846 3050B [3]
Nickel	16.0	6.7	mg/kg	1	02/21/19	02/22/19	ND	SW846 6010D [1]	SW846 3050B [3]
Thallium [a]	< 5.0	5.0	mg/kg	3	02/21/19	02/25/19	ND	SW846 6010D [2]	SW846 3050B [3]
Vanadium	31.0	8.4	mg/kg	1	02/21/19	02/22/19	ND	SW846 6010D [1]	SW846 3050B [3]

(1) Instrument QC Batch: MA46192
(2) Instrument QC Batch: MA46198
(3) Prep QC Batch: MP12690

(a) Elevated detection limit due to dilution required for high interfering element.

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-A17I		
Lab Sample ID:	JC83225-2A	**Date Sampled:**	02/20/19
Matrix:	SO - Soil	**Date Received:**	02/21/19
		Percent Solids:	59.5
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	18.1	5.7	mg/kg	1	02/25/19 15:28	DC	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

SO FB

CHAIN OF CUSTODY

SGS North America Inc. - Dayton
2235 Route 130, Dayton, NJ 08810
TEL. 732-329-0200 FAX: 732-329-3499/3480
www.sgs.com/ehsusa

Page _1 OF 1

FED-EX Tracking #: | Bottle Order Control #:
SGS Quote #: | SGS Job #: JC83295

Client / Reporting Information

Company Name: Arcadis
Street Address: 10 Friends Lane, Suite 200
City / State / Zip: Newtown, PA 18440
Project Contact / E-mail: Matthew Bell
Phone #: 610.755.7080
Sampler(s) Name(s) / Phone #: C Buchanan

Project Information

Project Name: PPG Site 107 (Jersey City)
Street: 18 Chapel Avenue
City / State: Jersey City NJ
Project #: NP000770.0003
Client Purchase Order #:
Project Manager: Jim Mclaughlin, Jr.

Billing Information (if different from Report to)
Company Name:
Street Address:
City / State / Zip:
Attention:

Requested Analysis

Matrix Codes: DW - Drinking Water; GW - Ground Water; WW - Water; SW - Surface Water; SO - Soil; SL - Sludge; SED-Sediment; OI - Oil; LIQ - Other Liquid; AIR - Air; SOL - Other Solid; WP - Wipe; FB - Field Blank; EB-Equipment Blank; RB - Rinse Blank; TB - Trip Blank

SGS Sample #	Field ID / Point of Collection	MEOH/DI Vial #	Collection Date	Collection Time	Sampled by	Grab (G) or Comp (C)	Matrix	# of bottles	HCl	NaOH	HNO3	H2SO4	NONE	DI Water	MEOH	ENCORE	Total Chromium	Hexavalent Chromium	Trivalent Chromium	Antimony	Nickel	Thallium	Vanadium	LAB USE ONLY
1	FB(20190222)		2/22/19	1300	CB	G	FB	2				1	1				X	X	X	X	X	X	X	
2	CS-G18		2/22/19	1345	CB	G	SO	1					1				X	X	X	X	X	X	X	
3	BS-B17		2/22/19	1345	CB	G	SO	1					1				X	X	X	X	X	X	X	A39
4	BS-C18A		2/22/19	1345	CB	G	SO	1					1				X	X	X	X	X	X	X	C20
																								D12

Turn Around Time (Business Days)

Approved By (SGS PM) / Date:

- [ ] 10 Business Days
- [ ] 5 Business Days
- [ ] 3 Business Days*
- [x] 2 Business Days*
- [ ] 1 Business Day*
- [ ] Other

All data available via Lablink

*Approval needed for 1-3 Business Day TAT

Deliverable

- [ ] Commercial "A" (Level 1)
- [ ] Commercial "B" (Level 2)
- [ ] NJ Reduced (Level 3)
- [ ] Full Tier I (Level 4)
- [ ] Commercial "C"
- [ ] NJ DKQP
- [ ] NYASP Category A
- [ ] NYASP Category B
- [ ] MA MCP Criteria
- [ ] CT RCP Criteria
- [ ] State Forms
- [x] EQD Format _Equis_
- [ ] DOD-QSM5

Commercial "A" = Results only; Commercial "B" = Results + QC Summary
Commercial "C" = Results + QC Summary + Partial Raw data

Comments / Special Instructions

INITIAL ASESSMENT 3A

LABEL VERIFICATION

http://www.sgs.com/en/terms-and-conditions

Sample Custody must be documented below each time samples change possession, including courier delivery.

Relinquished by:	Date / Time:	Received By:	Relinquished By:	Date / Time:	Received By:
1	2/22/19 1400	Robert Andrews	2 Robert Andrews	2.22.19 1559	2
Relinquished by: 3	Date / Time:	Received By: 3	Relinquished By: 4	Date / Time:	Received By: 4
Relinquished by: 5	Date / Time:	Received By: 5	Custody Seal # 23208 ☐ Intact ☐ Not Intact	Preserved where applicable ☑ Absent	On Ice ☑ Cooler Temp. °C 3.2

Therm. ID: JP

Copy of SGS Post Ex Sample COCs Template 20190109

5.2 5

Report of Analysis

Client Sample ID:	FB(20190222)		
Lab Sample ID:	JC83295-1	**Date Sampled:**	02/22/19
Matrix:	AQ - Field Blank Soil	**Date Received:**	02/22/19
		Percent Solids:	n/a
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	< 0.010	0.010	mg/l	1	02/22/19 18:10	DC	SW846 7196A
Redox Potential Vs H2	481		mv	1	02/25/19 09:36	RI	ASTM D1498-76
pH [a]	5.94		su	1	02/22/19 16:14	SUB	SM4500H+ B-11

(a) Sample received out of holding time for pH analysis.

RL = Reporting Limit

Report of Analysis

Client Sample ID:	CS-G18		
Lab Sample ID:	JC83295-2	**Date Sampled:**	02/22/19
Matrix:	SO - Soil	**Date Received:**	02/22/19
		Percent Solids:	77.6
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	13.2 J-	0.52	mg/kg	1	02/26/19 14:09	NV	SW846 3060A/7196A
Redox Potential Vs H2	413		mv	1	02/25/19 13:31	RI	ASTM D1498-76M
Solids, Percent	77.6		%	1	02/24/19 12:45	BG	SM2540 G 18TH ED MOD
pH	7.99 J		su	1	02/25/19 13:06	RI	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-B17		
Lab Sample ID:	JC83295-3	**Date Sampled:**	02/22/19
Matrix:	SO - Soil	**Date Received:**	02/22/19
		Percent Solids:	68.8
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	2.8 J-	0.58	mg/kg	1	02/26/19 14:14	NV	SW846 3060A/7196A
Redox Potential Vs H2	293		mv	1	02/25/19 13:40	RI	ASTM D1498-76M
Solids, Percent	68.8		%	1	02/24/19 12:45	BG	SM2540 G 18TH ED MOD
pH	6.63 J		su	1	02/25/19 13:09	RI	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-C18		
Lab Sample ID:	JC83295-4	**Date Sampled:**	02/22/19
Matrix:	SO - Soil	**Date Received:**	02/22/19
		Percent Solids:	61.8
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	< 0.65 UJ-	0.65	mg/kg	1	02/26/19 14:14	NV	SW846 3060A/7196A
Redox Potential Vs H2	290		mv	1	02/25/19 13:44	RI	ASTM D1498-76M
Solids, Percent	61.8		%	1	02/24/19 12:45	BG	SM2540 G 18TH ED MOD
pH	6.19 J		su	1	02/25/19 13:24	RI	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID:	CS-G18		
Lab Sample ID:	JC83295-2R	**Date Sampled:**	02/22/19
Matrix:	SO - Soil	**Date Received:**	02/22/19
		Percent Solids:	77.6
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	116	2.6	mg/kg	5	03/04/19 10:52	RI	SW846 3060A/7196A

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-B17		
Lab Sample ID:	JC83295-3R	**Date Sampled:**	02/22/19
Matrix:	SO - Soil	**Date Received:**	02/22/19
		Percent Solids:	68.8
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	< 0.58	0.58	mg/kg	1	03/04/19 10:52	RI	SW846 3060A/7196A

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-C18		
Lab Sample ID:	JC83295-4R	**Date Sampled:**	02/22/19
Matrix:	SO - Soil	**Date Received:**	02/22/19
		Percent Solids:	61.8
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	1.3	0.65	mg/kg	1	03/04/19 10:52	RI	SW846 3060A/7196A

RL = Reporting Limit

Report of Analysis

Client Sample ID: FB(20190222)
Lab Sample ID: JC83295-1A
Matrix: AQ - Field Blank Soil
Project: PPG Site 107, 18 Chapel Avenue, Jersey City, NJ

Date Sampled: 02/22/19
Date Received: 02/22/19
Percent Solids: n/a

Total Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 6.0	6.0	ug/l	1	02/25/19	02/25/19	ND	SW846 6010D [1]	SW846 3010A [2]
Chromium	< 10	10	ug/l	1	02/25/19	02/25/19	ND	SW846 6010D [1]	SW846 3010A [2]
Nickel	< 10	10	ug/l	1	02/25/19	02/25/19	ND	SW846 6010D [1]	SW846 3010A [2]
Thallium	< 10	10	ug/l	1	02/25/19	02/25/19	ND	SW846 6010D [1]	SW846 3010A [2]
Vanadium	< 50	50	ug/l	1	02/25/19	02/25/19	ND	SW846 6010D [1]	SW846 3010A [2]

(1) Instrument QC Batch: MA46199
(2) Prep QC Batch: MP12719

RL = Reporting Limit

Report of Analysis

Client Sample ID:	FB(20190222)		
Lab Sample ID:	JC83295-1A	**Date Sampled:**	02/22/19
Matrix:	AQ - Field Blank Soil	**Date Received:**	02/22/19
		Percent Solids:	n/a
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	< 0.020	0.020	mg/l	1	02/25/19 17:50	ND	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	CS-G18		
Lab Sample ID:	JC83295-2A	**Date Sampled:**	02/22/19
Matrix:	SO - Soil	**Date Received:**	02/22/19
		Percent Solids:	77.6
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 2.5	2.5	mg/kg	1	02/25/19	02/25/19	ND	SW846 6010D [1]	SW846 3050B [2]
Chromium	288	1.3	mg/kg	1	02/25/19	02/25/19	ND	SW846 6010D [1]	SW846 3050B [2]
Nickel	21.5	5.0	mg/kg	1	02/25/19	02/25/19	ND	SW846 6010D [1]	SW846 3050B [2]
Thallium	< 1.3	1.3	mg/kg	1	02/25/19	02/25/19	ND	SW846 6010D [1]	SW846 3050B [2]
Vanadium	19.0	6.3	mg/kg	1	02/25/19	02/25/19	ND	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA46197
(2) Prep QC Batch: MP12717

RL = Reporting Limit

Report of Analysis

Client Sample ID:	CS-G18		
Lab Sample ID:	JC83295-2A	**Date Sampled:**	02/22/19
Matrix:	SO - Soil	**Date Received:**	02/22/19
		Percent Solids:	77.6
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	275	1.8	mg/kg	1	02/26/19 14:09	NV	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-B17		
Lab Sample ID:	JC83295-3A	**Date Sampled:**	02/22/19
Matrix:	SO - Soil	**Date Received:**	02/22/19
		Percent Solids:	68.8
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 3.1	3.1	mg/kg	1	02/25/19	02/25/19	ND	SW846 6010D [1]	SW846 3050B [2]
Chromium	16.6	1.5	mg/kg	1	02/25/19	02/25/19	ND	SW846 6010D [1]	SW846 3050B [2]
Nickel	14.7	6.1	mg/kg	1	02/25/19	02/25/19	ND	SW846 6010D [1]	SW846 3050B [2]
Thallium	< 1.5	1.5	mg/kg	1	02/25/19	02/25/19	ND	SW846 6010D [1]	SW846 3050B [2]
Vanadium	24.1	7.6	mg/kg	1	02/25/19	02/25/19	ND	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA46197
(2) Prep QC Batch: MP12717

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-B17		
Lab Sample ID:	JC83295-3A	**Date Sampled:**	02/22/19
Matrix:	SO - Soil	**Date Received:**	02/22/19
		Percent Solids:	68.8
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	13.8	2.1	mg/kg	1	02/26/19 14:14	NV	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-C18		
Lab Sample ID:	JC83295-4A	**Date Sampled:**	02/22/19
Matrix:	SO - Soil	**Date Received:**	02/22/19
		Percent Solids:	61.8
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 3.2	3.2	mg/kg	1	02/25/19	02/25/19	ND	SW846 6010D [1]	SW846 3050B [2]
Chromium	62.3	1.6	mg/kg	1	02/25/19	02/25/19	ND	SW846 6010D [1]	SW846 3050B [2]
Nickel	16.4	6.4	mg/kg	1	02/25/19	02/25/19	ND	SW846 6010D [1]	SW846 3050B [2]
Thallium	< 1.6	1.6	mg/kg	1	02/25/19	02/25/19	ND	SW846 6010D [1]	SW846 3050B [2]
Vanadium	25.9	8.0	mg/kg	1	02/25/19	02/25/19	ND	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA46197
(2) Prep QC Batch: MP12717

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-C18		
Lab Sample ID:	JC83295-4A	**Date Sampled:**	02/22/19
Matrix:	SO - Soil	**Date Received:**	02/22/19
		Percent Solids:	61.8
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	61.7	2.3	mg/kg	1	02/26/19 14:14	NV	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	CS-G18		
Lab Sample ID:	JC83295-2RT	**Date Sampled:**	02/22/19
Matrix:	SO - Soil	**Date Received:**	02/22/19
		Percent Solids:	77.6
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Iron, Ferrous [a]	0.42 J	0.20	%	1	03/18/19 10:20	MP	ASTM D3872-86
~~Sulfide Screen [b]~~	~~NEGATIVE~~			~~1~~	~~03/18/19 12:30~~	~~MP~~	~~SM4500S2- A-11~~ R
Total Organic Carbon [c]	183000 J	130	mg/kg	1	03/19/19 23:20	CD	LLOYD KAHN 1988 MOD

(a) The ferrous iron test was analyzed after completion of Cr6 testing (outside of normal hold times for this parameter) in order to provide more information about the possible impact of the sample matrix on Cr6 recoveries.
(b) The sulfide screen test was analyzed after completion of Cr6 testing (outside of normal hold times for this parameter) in order to provide more information about the possible impact of the sample matrix on Cr6 recoveries.
(c) Analysis done out of holding time.

RL = Reporting Limit

SO FB

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CHAIN OF CUSTODY

SGS

SGS North America Inc. - Dayton
2235 Route 130, Dayton, NJ 08810
TEL. 732-329-0200 FAX: 732-329-3499/3480
www.sgs.com/ehsusa

Page 1 of 1

FED-EX Tracking #:
Bottle Order Control #: AK-011719-149
SGS Quote #:
SGS Job #: JC83296

Client / Reporting Information	Project Information	
Company Name: Arcadis	Project Name: PPG Jersey City Site 107	
Street Address: 10 Friends Lane	Street: 18 Chapel Ave	Billing Information (if different from Report to)
City: Newtown State: PA Zip: 18940	City: Jersey City State: NJ	Company Name
Project Contact: Matt Bell E-mail	Project #: NP000770.0003	Street Address
Phone #: 646.752.5629	Client Purchase Order #	City State Zip
Sampler(s) Name(s): [illegible] Phone #	Project Manager: Jim McLaughlin	Attention:

Requested Analysis: Total Chromium, Trivalent Chromium, Hexavalent Chromium, Antimony, Nickel, Thallium, Vanadium

Matrix Codes: DW - Drinking Water, GW - Ground Water, WW - Water, SW - Surface Water, SO - Soil, SL - Sludge, SED-Sediment, OI - Oil, LIQ - Other Liquid, AIR - Air, SOL - Other Solid, WP - Wipe, FB - Field Blank, EB-Equipment Blank, RB - Rinse Blank, TB - Trip Blank

SGS Sample #	Field ID / Point of Collection	MEOH/DI Vial #	Date	Time	Sampled by	Grab (G) Comp (C)	Matrix	# of bottles	HCl	NaOH	HNO_3	H_2SO_4	NONE	DI Water	MEOH	ENCORE	Total Chromium	Trivalent Chromium	Hexavalent Chromium	Antimony	Nickel	Thallium	Vanadium	LAB USE ONLY
1	FB(20190222)-A		2/22/19	0800	CC		FB	2			1		1				X	X	X	X	X	X	X	
2	SW-A24(0.0-0.5)		2/22/19	0845	CC		SO	1					1				X	X	X	X	X	X	X	D12
	SW-A24(2.0-2.5)		2/22/19	0855	CC		SO	1					1				X	X	X	X	X	X	X	
3	SW-A24(2.0-2.5)MS		2/22/19	0855	CC		SO	1					1				X	X	X	X	X	X	X	A39
	SW-A24(2.0-2.5)MSD		2/22/19	0855	CC		SO	1					1				X	X	X	X	X	X	X	C20
4	SW-A25(0.0-0.5)		2/22/19	0905	CC		SO	1					1				X	X	X	X	X	X	X	
5	SW-A25(2.0-2.5)		2/22/19	0915	CC		SO	1					1				X	X	X	X	X	X	X	
6	SW-A26(0.0-0.5)		2/22/19	0925	CC		SO	1					1				X	X	X	X	X	X	X	
7	SW-A26(2.0-2.5)		2/22/19	0935	CC		SO	1					1				X	X	X	X	X	X	X	
8	DUP-03(20190222)RR		2/22/19	—	CC		SO	1					1				X	X	X	X	X	X	X	

Turn Around Time (Business Days)

- [ ] 10 Business Days
- [ ] 5 Business Days
- [ ] 3 Business Days*
- [x] 2 Business Days*
- [ ] 1 Business Day*
- [ ] Other

Approved By (SGS PM): / Date:

All data available via Lablink

* Approval needed for 1-3 Business Day TAT

Deliverable

- [ ] Commercial "A" (Level 1)
- [ ] Commercial "B" (Level 2)
- [ ] NJ Reduced (Level 3)
- [ ] Full Tier I (Level 4)
- [ ] Commercial "C"
- [ ] NJ DKQP
- [ ] NYASP Category A
- [ ] NYASP Category B
- [ ] MA MCP Criteria
- [ ] CT RCP Criteria
- [ ] State Forms
- [x] ~~EDD Format~~ EQuIS
- [ ] DOD-QSM5

Commercial "A" = Results only; Commercial "B" = Results + QC Summary
Commercial "C" = Results + QC Summary + Partial Raw data

Comments / Special Instructions

INITIAL ASESSMENT 3A ①

LABEL VERIFICATION

http://www.sgs.com/en/terms-and-conditions

Sample Custody must be documented below each time samples change possession, including courier delivery.

Relinquished by:	Date / Time:	Received By:	Relinquished By:	Date / Time:	Received By:
1 [signature]	2/22/19 1430	1 Robert Chambers	2 Robert Chambers	2-22-19 1559	2 [signature]
3		3	4		4
5		5	Custody Seal # 23584	Intact / Not intact; Preserved where applicable / Absent; Therm. ID:	On Ice; Cooler Temp. °C: IP 3.2°C

EHSA-QAC-0023-02-FORM-Dayton - Standard COC.xlsx

5.2

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JC83296: Chain of Custody
Page 1 of 3

Report of Analysis

Client Sample ID:	FB(20190222)-A		
Lab Sample ID:	JC83296-1	**Date Sampled:**	02/22/19
Matrix:	AQ - Field Blank Soil	**Date Received:**	02/22/19
		Percent Solids:	n/a
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	< 0.010	0.010	mg/l	1	02/22/19 18:10	DC	SW846 7196A
Redox Potential Vs H2	489		mv	1	02/25/19 09:39	RI	ASTM D1498-76
pH [a]	4.96		su	1	02/22/19 16:15	SUB	SM4500H+ B-11

(a) Sample received out of holding time for pH analysis.

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A24(0.0-0.5)		
Lab Sample ID:	JC83296-2	**Date Sampled:**	02/22/19
Matrix:	SO - Soil	**Date Received:**	02/22/19
		Percent Solids:	83.6
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	3.0 J-	0.48	mg/kg	1	02/26/19 14:17	DC	SW846 3060A/7196A
Redox Potential Vs H2	389		mv	1	02/25/19 12:06	RI	ASTM D1498-76M
Solids, Percent	83.6		%	1	02/24/19 12:45	BG	SM2540 G 18TH ED MOD
pH	5.85 J		su	1	02/25/19 11:59	RI	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID: SW-A24(2.0-2.5)
Lab Sample ID: JC83296-3
Matrix: SO - Soil
Project: PPG Site 107, 18 Chapel Avenue, Jersey City, NJ

Date Sampled: 02/22/19
Date Received: 02/22/19
Percent Solids: 77.5

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	44.5 J-	0.52	mg/kg	1	02/26/19 14:10	DC	SW846 3060A/7196A
Redox Potential Vs H2	287		mv	1	02/25/19 11:59	RI	ASTM D1498-76M
Solids, Percent	77.5		%	1	02/24/19 12:45	BG	SM2540 G 18TH ED MOD
pH	7.46 J		su	1	02/25/19 11:47	RI	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A25(0.0-0.5)		
Lab Sample ID:	JC83296-4	**Date Sampled:**	02/22/19
Matrix:	SO - Soil	**Date Received:**	02/22/19
		Percent Solids:	80.6
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	6.8 J-	0.50	mg/kg	1	02/26/19 14:17	DC	SW846 3060A/7196A
Redox Potential Vs H2	358		mv	1	02/25/19 12:51	RI	ASTM D1498-76M
Solids, Percent	80.6		%	1	02/24/19 12:45	BG	SM2540 G 18TH ED MOD
pH	7.23 J		su	1	02/25/19 12:06	RI	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A25(2.0-2.5)		
Lab Sample ID:	JC83296-5	**Date Sampled:**	02/22/19
Matrix:	SO - Soil	**Date Received:**	02/22/19
		Percent Solids:	72.2
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	14.0 J-	0.55	mg/kg	1	02/26/19 14:17	DC	SW846 3060A/7196A
Redox Potential Vs H2	412		mv	1	02/25/19 12:55	RI	ASTM D1498-76M
Solids, Percent	72.2		%	1	02/24/19 12:45	BG	SM2540 G 18TH ED MOD
pH	7.19 J		su	1	02/25/19 12:51	RI	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A26(0.0-0.5)		
Lab Sample ID:	JC83296-6	**Date Sampled:**	02/22/19
Matrix:	SO - Soil	**Date Received:**	02/22/19
		Percent Solids:	85.0
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	14.3 J-	0.47	mg/kg	1	02/26/19 14:17	DC	SW846 3060A/7196A
Redox Potential Vs H2	363		mv	1	02/25/19 13:03	RI	ASTM D1498-76M
Solids, Percent	85		%	1	02/24/19 12:45	BG	SM2540 G 18TH ED MOD
pH	7.85 J		su	1	02/25/19 12:54	RI	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A26(2.0-2.5)		
Lab Sample ID:	JC83296-7	**Date Sampled:**	02/22/19
Matrix:	SO - Soil	**Date Received:**	02/22/19
		Percent Solids:	72.1
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	43.4 J-	0.55	mg/kg	1	02/26/19 14:17	DC	SW846 3060A/7196A
Redox Potential Vs H2	356		mv	1	02/25/19 13:07	RI	ASTM D1498-76M
Solids, Percent	72.1		%	1	02/24/19 12:45	BG	SM2540 G 18TH ED MOD
pH	8.15 J		su	1	02/25/19 12:56	RI	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID: DUP-03(20190222)RR
Lab Sample ID: JC83296-8
Matrix: SO - Soil
Project: PPG Site 107, 18 Chapel Avenue, Jersey City, NJ

Date Sampled: 02/22/19
Date Received: 02/22/19
Percent Solids: 72.9

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	14.0 J-	0.55	mg/kg	1	02/26/19 14:17	DC	SW846 3060A/7196A
Redox Potential Vs H2	458		mv	1	02/25/19 13:25	RI	ASTM D1498-76M
Solids, Percent	72.9		%	1	02/24/19 12:45	BG	SM2540 G 18TH ED MOD
pH	7.35 J		su	1	02/25/19 13:02	RI	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A24(0.0-0.5)		
Lab Sample ID:	JC83296-2R	**Date Sampled:**	02/22/19
Matrix:	SO - Soil	**Date Received:**	02/22/19
		Percent Solids:	83.6
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	48.2	0.96	mg/kg	2	03/04/19 12:29	RI	SW846 3060A/7196A

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A24(2.0-2.5)		
Lab Sample ID:	JC83296-3R	**Date Sampled:**	02/22/19
Matrix:	SO - Soil	**Date Received:**	02/22/19
		Percent Solids:	77.5
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	46.2	0.52	mg/kg	1	03/04/19 12:22	RI	SW846 3060A/7196A

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A25(0.0-0.5)		
Lab Sample ID:	JC83296-4R	**Date Sampled:**	02/22/19
Matrix:	SO - Soil	**Date Received:**	02/22/19
		Percent Solids:	80.6
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	6.0	0.50	mg/kg	1	03/04/19 12:29	RI	SW846 3060A/7196A

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A25(2.0-2.5)		
Lab Sample ID:	JC83296-5R	**Date Sampled:**	02/22/19
Matrix:	SO - Soil	**Date Received:**	02/22/19
		Percent Solids:	72.2
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	71.4	1.1	mg/kg	2	03/04/19 12:29	RI	SW846 3060A/7196A

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A26(0.0-0.5)		
Lab Sample ID:	JC83296-6R	**Date Sampled:**	02/22/19
Matrix:	SO - Soil	**Date Received:**	02/22/19
		Percent Solids:	85.0
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	12.4	0.47	mg/kg	1	03/04/19 12:29	RI	SW846 3060A/7196A

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A26(2.0-2.5)		
Lab Sample ID:	JC83296-7R	**Date Sampled:**	02/22/19
Matrix:	SO - Soil	**Date Received:**	02/22/19
		Percent Solids:	72.1
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	33.9	0.55	mg/kg	1	03/04/19 12:29	RI	SW846 3060A/7196A

RL = Reporting Limit

Report of Analysis

Client Sample ID:	DUP-03(20190222)RR		
Lab Sample ID:	JC83296-8R	**Date Sampled:**	02/22/19
Matrix:	SO - Soil	**Date Received:**	02/22/19
		Percent Solids:	72.9
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	16.4	0.55	mg/kg	1	03/04/19 12:29	RI	SW846 3060A/7196A

RL = Reporting Limit

Report of Analysis

Client Sample ID: FB(20190222)-A
Lab Sample ID: JC83296-1A
Matrix: AQ - Field Blank Soil
Project: PPG Site 107, 18 Chapel Avenue, Jersey City, NJ

Date Sampled: 02/22/19
Date Received: 02/22/19
Percent Solids: n/a

Total Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 6.0	6.0	ug/l	1	02/25/19	02/25/19	ND	SW846 6010D [1]	SW846 3010A [2]
Chromium	< 10	10	ug/l	1	02/25/19	02/25/19	ND	SW846 6010D [1]	SW846 3010A [2]
Nickel	< 10	10	ug/l	1	02/25/19	02/25/19	ND	SW846 6010D [1]	SW846 3010A [2]
Thallium	< 10	10	ug/l	1	02/25/19	02/25/19	ND	SW846 6010D [1]	SW846 3010A [2]
Vanadium	< 50	50	ug/l	1	02/25/19	02/25/19	ND	SW846 6010D [1]	SW846 3010A [2]

(1) Instrument QC Batch: MA46199
(2) Prep QC Batch: MP12719

RL = Reporting Limit

Report of Analysis

Client Sample ID:	FB(20190222)-A		
Lab Sample ID:	JC83296-1A	**Date Sampled:**	02/22/19
Matrix:	AQ - Field Blank Soil	**Date Received:**	02/22/19
		Percent Solids:	n/a
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	< 0.020	0.020	mg/l	1	02/25/19 17:56	ND	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID: SW-A24(0.0-0.5)
Lab Sample ID: JC83296-2A
Matrix: SO - Soil
Project: PPG Site 107, 18 Chapel Avenue, Jersey City, NJ

Date Sampled: 02/22/19
Date Received: 02/22/19
Percent Solids: 83.6

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 2.3 UJ-	2.3	mg/kg	1	02/25/19	02/25/19	ND	SW846 6010D [1]	SW846 3050B [2]
Chromium	22.9 J	1.1	mg/kg	1	02/25/19	02/25/19	ND	SW846 6010D [1]	SW846 3050B [2]
Nickel	19.5	4.6	mg/kg	1	02/25/19	02/25/19	ND	SW846 6010D [1]	SW846 3050B [2]
Thallium	< 1.1	1.1	mg/kg	1	02/25/19	02/25/19	ND	SW846 6010D [1]	SW846 3050B [2]
Vanadium	24.4	5.7	mg/kg	1	02/25/19	02/25/19	ND	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA46197
(2) Prep QC Batch: MP12717

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A24(0.0-0.5)		
Lab Sample ID:	JC83296-2A	**Date Sampled:**	02/22/19
Matrix:	SO - Soil	**Date Received:**	02/22/19
		Percent Solids:	83.6
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	19.9	1.6	mg/kg	1	02/26/19 14:17	DC	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A24(2.0-2.5)		
Lab Sample ID:	JC83296-3A	**Date Sampled:**	02/22/19
Matrix:	SO - Soil	**Date Received:**	02/22/19
		Percent Solids:	77.5
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 2.5 UJ-	2.5	mg/kg	1	02/25/19	02/25/19	ND	SW846 6010D [1]	SW846 3050B [2]
Chromium	743 J	1.3	mg/kg	1	02/25/19	02/25/19	ND	SW846 6010D [1]	SW846 3050B [2]
Nickel	62.0	5.1	mg/kg	1	02/25/19	02/25/19	ND	SW846 6010D [1]	SW846 3050B [2]
Thallium [a]	< 2.5	2.5	mg/kg	2	02/25/19	02/25/19	ND	SW846 6010D [1]	SW846 3050B [2]
Vanadium	85.0	6.3	mg/kg	1	02/25/19	02/25/19	ND	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA46197
(2) Prep QC Batch: MP12717

(a) Elevated detection limit due to dilution required for high interfering element.

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A24(2.0-2.5)		
Lab Sample ID:	JC83296-3A	**Date Sampled:**	02/22/19
Matrix:	SO - Soil	**Date Received:**	02/22/19
		Percent Solids:	77.5
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	699	1.8	mg/kg	1	02/26/19 14:10	DC	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A25(0.0-0.5)		
Lab Sample ID:	JC83296-4A	**Date Sampled:**	02/22/19
Matrix:	SO - Soil	**Date Received:**	02/22/19
		Percent Solids:	80.6
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 2.4 UJ-	2.4	mg/kg	1	02/25/19	02/25/19	ND	SW846 6010D [1]	SW846 3050B [2]
Chromium	191 J	1.2	mg/kg	1	02/25/19	02/25/19	ND	SW846 6010D [1]	SW846 3050B [2]
Nickel	39.6	4.8	mg/kg	1	02/25/19	02/25/19	ND	SW846 6010D [1]	SW846 3050B [2]
Thallium	< 1.2	1.2	mg/kg	1	02/25/19	02/25/19	ND	SW846 6010D [1]	SW846 3050B [2]
Vanadium	54.5	6.0	mg/kg	1	02/25/19	02/25/19	ND	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA46197
(2) Prep QC Batch: MP12717

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A25(0.0-0.5)		
Lab Sample ID:	JC83296-4A	**Date Sampled:**	02/22/19
Matrix:	SO - Soil	**Date Received:**	02/22/19
		Percent Solids:	80.6
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	184	1.7	mg/kg	1	02/26/19 14:17	DC	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A25(2.0-2.5)		
Lab Sample ID:	JC83296-5A	**Date Sampled:**	02/22/19
Matrix:	SO - Soil	**Date Received:**	02/22/19
		Percent Solids:	72.2
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	3.7 J-	2.7	mg/kg	1	02/25/19	02/25/19	ND	SW846 6010D [1]	SW846 3050B [2]
Chromium	181 J	1.3	mg/kg	1	02/25/19	02/25/19	ND	SW846 6010D [1]	SW846 3050B [2]
Nickel	34.5	5.3	mg/kg	1	02/25/19	02/25/19	ND	SW846 6010D [1]	SW846 3050B [2]
Thallium [a]	< 2.7	2.7	mg/kg	2	02/25/19	02/25/19	ND	SW846 6010D [1]	SW846 3050B [2]
Vanadium	38.5	6.7	mg/kg	1	02/25/19	02/25/19	ND	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA46197
(2) Prep QC Batch: MP12717

(a) Elevated detection limit due to dilution required for high interfering element.

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A25(2.0-2.5)		
Lab Sample ID:	JC83296-5A	**Date Sampled:**	02/22/19
Matrix:	SO - Soil	**Date Received:**	02/22/19
		Percent Solids:	72.2
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	167	1.9	mg/kg	1	02/26/19 14:17	DC	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A26(0.0-0.5)		
Lab Sample ID:	JC83296-6A	**Date Sampled:**	02/22/19
Matrix:	SO - Soil	**Date Received:**	02/22/19
		Percent Solids:	85.0
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 2.2 UJ-	2.2	mg/kg	1	02/25/19	02/25/19	ND	SW846 6010D [1]	SW846 3050B [2]
Chromium	748 J	1.1	mg/kg	1	02/25/19	02/25/19	ND	SW846 6010D [1]	SW846 3050B [2]
Nickel	126	4.5	mg/kg	1	02/25/19	02/25/19	ND	SW846 6010D [1]	SW846 3050B [2]
Thallium [a]	< 5.6	5.6	mg/kg	5	02/25/19	02/25/19	ND	SW846 6010D [1]	SW846 3050B [2]
Vanadium	223	5.6	mg/kg	1	02/25/19	02/25/19	ND	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA46197
(2) Prep QC Batch: MP12717

(a) Elevated detection limit due to dilution required for high interfering element.

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A26(0.0-0.5)		
Lab Sample ID:	JC83296-6A	**Date Sampled:**	02/22/19
Matrix:	SO - Soil	**Date Received:**	02/22/19
		Percent Solids:	85.0
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	734	1.6	mg/kg	1	02/26/19 14:17	DC	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A26(2.0-2.5)		
Lab Sample ID:	JC83296-7A	**Date Sampled:**	02/22/19
Matrix:	SO - Soil	**Date Received:**	02/22/19
		Percent Solids:	72.1
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 2.7 UJ-	2.7	mg/kg	1	02/25/19	02/25/19	ND	SW846 6010D [1]	SW846 3050B [2]
Chromium	920 J	1.4	mg/kg	1	02/25/19	02/25/19	ND	SW846 6010D [1]	SW846 3050B [2]
Nickel	154	5.5	mg/kg	1	02/25/19	02/25/19	ND	SW846 6010D [1]	SW846 3050B [2]
Thallium [a]	< 2.7	2.7	mg/kg	2	02/25/19	02/25/19	ND	SW846 6010D [1]	SW846 3050B [2]
Vanadium	283	6.9	mg/kg	1	02/25/19	02/25/19	ND	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA46197
(2) Prep QC Batch: MP12717

(a) Elevated detection limit due to dilution required for high interfering element.

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A26(2.0-2.5)		
Lab Sample ID:	JC83296-7A	**Date Sampled:**	02/22/19
Matrix:	SO - Soil	**Date Received:**	02/22/19
		Percent Solids:	72.1
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	877	2.0	mg/kg	1	02/26/19 14:17	DC	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	DUP-03(20190222)RR		
Lab Sample ID:	JC83296-8A	**Date Sampled:**	02/22/19
Matrix:	SO - Soil	**Date Received:**	02/22/19
		Percent Solids:	72.9
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 2.7 UJ-	2.7	mg/kg	1	02/25/19	02/25/19	ND	SW846 6010D [1]	SW846 3050B [2]
Chromium	177 J	1.3	mg/kg	1	02/25/19	02/25/19	ND	SW846 6010D [1]	SW846 3050B [2]
Nickel	28.8	5.4	mg/kg	1	02/25/19	02/25/19	ND	SW846 6010D [1]	SW846 3050B [2]
Thallium	< 1.3	1.3	mg/kg	1	02/25/19	02/25/19	ND	SW846 6010D [1]	SW846 3050B [2]
Vanadium	33.0	6.7	mg/kg	1	02/25/19	02/25/19	ND	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA46197
(2) Prep QC Batch: MP12717

RL = Reporting Limit

Report of Analysis

Client Sample ID:	DUP-03(20190222)RR		
Lab Sample ID:	JC83296-8A	**Date Sampled:**	02/22/19
Matrix:	SO - Soil	**Date Received:**	02/22/19
		Percent Solids:	72.9
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	163	1.9	mg/kg	1	02/26/19 14:17	DC	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

SO
FB

CHAIN OF CUSTODY

SGS North America Inc. - Dayton
2235 Route 130, Dayton, NJ 08810
TEL. 732-329-0200 FAX: 732-329-3499/3480
www.sgs.com/ehsusa

Page 1 of 1

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FED-EX Tracking #:
SGS Quote #:
Bottle Order Control #: AR-811719-103
SGS Job #: JC83377

Client / Reporting Information

Company Name: Arcadis
Street Address: 10 Friends Lane Suite200
City: Newtown State: PA Zip: 18940
Project Contact: Matt Bell E-mail:
Phone #:
Sampler(s) Name(s): Christin Cifelli Phone #:

Project Information

Project Name: PPG Jersey City S.Lt 107
Street: 18 Chapel Ave.
City: Jersey City State: NJ
Project #: NP000770.0003
Client Purchase Order #:
Project Manager: Jim McLaughlin

Billing Information (if different from Report to)
Company Name:
Street Address:
City: State: Zip:
Attention:

Requested Analysis

Matrix Codes: DW - Drinking Water; GW - Ground Water; WW - Water; SW - Surface Water; SO - Soil; SL- Sludge; SED-Sediment; OI - Oil; LIQ - Other Liquid; AIR - Air; SOL - Other Solid; WP - Wipe; FB - Field Blank; EB-Equipment Blank; RB - Rinse Blank; TB - Trip Blank

SGS Sample #	Field ID / Point of Collection	MEOH/DI Vial #	Collection Date	Collection Time	Sampled by	Grab (G) Comp (C)	Matrix	# of bottles	HCl	NaOH	HNO3 H2SO4	NONE	DI Water	MEOH	ENCORE	Total Chromium	Trivalent Chromium	Hexavalent Chromium	Antimony	Nickel	Thallium	Vanadium	LAB USE ONLY
1	FB(20190225)		2/25/19	0900	CC	G	FB	2			1	1				X	X	X	X	X	X	X	
2	BS-B3		2/25/19	1315	CC	G	SO	1				1				X	X	X	X	X	X	X	A39
																							G4
																							D14

Turn Around Time (Business Days)

Approved By (SGS PM): / Date:

- [ ] 10 Business Days
- [ ] 5 Business Days
- [ ] 3 Business Days*
- [X] 2 Business Days*
- [ ] 1 Business Day*
- [ ] Other

All data available via Lablink

* Approval needed for 1-3 Business Day TAT

Deliverable

- [ ] Commercial "A" (Level 1)
- [ ] Commercial "B" (Level 2)
- [ ] NJ Reduced (Level 3)
- [ ] Full Tier I (Level 4)
- [ ] Commercial "C"
- [ ] NJ DKQP
- [ ] NYASP Category A
- [ ] NYASP Category B
- [ ] MA MCP Criteria
- [ ] CT RCP Criteria
- [ ] State Forms
- [X] EDD Format Equis
- [ ] DOD-QSM5

Commercial "A" = Results only; Commercial "B" = Results + QC Summary
Commercial "C" = Results + QC Summary + Partial Raw data

Comments / Special Instructions

INITIAL ASESSMENT LL 3A
LABEL VERIFICATION

http://www.sgs.com/en/terms-and-conditions

Sample Custody must be documented below each time samples change possession, including courier delivery.

	Relinquished by:	Date / Time:	Received By:	Relinquished By:	Date / Time:	Received By:
1	Christin Cifelli	2/25/19 1740	1 FEDEX 2/25/1920	2 FEDEX	1700	2
3			3	4		4
5			5	Custody Seal # 19070	Intact / Not intact	Preserved where applicable / Absent / Therm. ID:	On Ice	Cooler Temp. °C

EP
3.7

EHSA-QAC-0023-02-FORM-Dayton - Standard COC.xlsx

5.2 5

Report of Analysis

Client Sample ID:	FB(20190225)		
Lab Sample ID:	JC83377-1	**Date Sampled:**	02/25/19
Matrix:	AQ - Field Blank Soil	**Date Received:**	02/25/19
		Percent Solids:	n/a
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	< 0.010	0.010	mg/l	1	02/25/19 22:36	JO	SW846 7196A
Redox Potential Vs H2	458		mv	1	02/26/19 10:09	RI	ASTM D1498-76
pH [a]	5.52		su	1	02/25/19 17:30	AS	SM4500H+ B-11

(a) Sample received out of holding time for pH analysis.

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-B3		
Lab Sample ID:	JC83377-2	**Date Sampled:**	02/25/19
Matrix:	SO - Soil	**Date Received:**	02/25/19
		Percent Solids:	85.2
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	1.9 J-	0.47	mg/kg	1	02/26/19 16:50	DC	SW846 3060A/7196A
Redox Potential Vs H2	483		mv	1	02/26/19 15:41	RI	ASTM D1498-76M
Solids, Percent	85.2		%	1	02/26/19 09:15	EB	SM2540 G 18TH ED MOD
pH	7.54		su	1	02/26/19 15:19	RI	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-B3		
Lab Sample ID:	JC83377-2R	**Date Sampled:**	02/25/19
Matrix:	SO - Soil	**Date Received:**	02/25/19
		Percent Solids:	85.2
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	2.2	0.47	mg/kg	1	03/07/19 12:53	RI	SW846 3060A/7196A

RL = Reporting Limit

Report of Analysis

Client Sample ID: FB(20190225)
Lab Sample ID: JC83377-1A
Matrix: AQ - Field Blank Soil
Project: PPG Site 107, 18 Chapel Avenue, Jersey City, NJ

Date Sampled: 02/25/19
Date Received: 02/25/19
Percent Solids: n/a

Total Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 6.0	6.0	ug/l	1	02/26/19	02/26/19	ND	SW846 6010D [1]	SW846 3010A [2]
Chromium	< 10	10	ug/l	1	02/26/19	02/26/19	ND	SW846 6010D [1]	SW846 3010A [2]
Nickel	< 10	10	ug/l	1	02/26/19	02/26/19	ND	SW846 6010D [1]	SW846 3010A [2]
Thallium	< 10	10	ug/l	1	02/26/19	02/26/19	ND	SW846 6010D [1]	SW846 3010A [2]
Vanadium	< 50	50	ug/l	1	02/26/19	02/26/19	ND	SW846 6010D [1]	SW846 3010A [2]

(1) Instrument QC Batch: MA46212
(2) Prep QC Batch: MP12737

RL = Reporting Limit

Report of Analysis

Client Sample ID:	FB(20190225)		
Lab Sample ID:	JC83377-1A	**Date Sampled:**	02/25/19
Matrix:	AQ - Field Blank Soil	**Date Received:**	02/25/19
		Percent Solids:	n/a
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	< 0.020	0.020	mg/l	1	02/26/19 16:17	ND	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-B3		
Lab Sample ID:	JC83377-2A	**Date Sampled:**	02/25/19
Matrix:	SO - Soil	**Date Received:**	02/25/19
		Percent Solids:	85.2
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 2.3	2.3	mg/kg	1	02/26/19	02/26/19	ND	SW846 6010D [1]	SW846 3050B [2]
Chromium	34.0	1.2	mg/kg	1	02/26/19	02/26/19	ND	SW846 6010D [1]	SW846 3050B [2]
Nickel	13.2	4.7	mg/kg	1	02/26/19	02/26/19	ND	SW846 6010D [1]	SW846 3050B [2]
Thallium	< 1.2	1.2	mg/kg	1	02/26/19	02/26/19	ND	SW846 6010D [1]	SW846 3050B [2]
Vanadium	32.5	5.9	mg/kg	1	02/26/19	02/26/19	ND	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA46212
(2) Prep QC Batch: MP12733

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-B3		
Lab Sample ID:	JC83377-2A	**Date Sampled:**	02/25/19
Matrix:	SO - Soil	**Date Received:**	02/25/19
		Percent Solids:	85.2
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	32.1	1.7	mg/kg	1	02/26/19 16:50	DC	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

SGS

SO
FB

CHAIN OF CUSTODY

SGS North America Inc. - Dayton
2235 Route 130, Dayton, NJ 08810
TEL. 732-329-0200 FAX: 732-329-3499/3480
www.sgs.com/ehsusa

Page 1 OF 1

E

FED-EX Tracking #:
Bottle Order Control #: JC83434
SGS Quote #:
SGS Job #: AM-U11719-167

Client / Reporting Information

Company Name: Arcadis
Street Address: 10 Friends Lane, Suite 200
City / State / Zip: Newtown, PA 18440
Project Contact / E-mail: Matthew Bell
Phone #: 610.755.7080
Sampler(s) Name(s) / Phone #: C Cifelli

Project Information

Project Name: PPG Site 107 (Jersey City)
Street: 18 Chapel Avenue
City / State: Jersey City NJ
Project #: NP000770.0001
Client Purchase Order #:
Project Manager: Jim Mclaughlin, Jr.

Billing Information (If different from Report to)
Company Name:
Street Address:
City / State / Zip:
Attention:

Requested Analysis

SGS Sample #	Field ID / Point of Collection	MEOH/DI Vial #	Collection Date	Collection Time	Sampled by	Grab (G) Comp (C)	Matrix	# of bottles	Number of preserved Bottles: HCl	MeOH	HNO3	H2SO4	NONE	DI Water	MEOH	ENCORE	Total Chromium	Hexavalent Chromium	Trivalent Chromium	Antimony	Nickel	Thallium	Vanadium	LAB USE ONLY
1	FB(20190226)-A		2/26/19	0900	CC	G	FB	1			1		1				X	X	X	X	X	X	X	
2	SW-A27(0.0-0.5)		2/26/19	0945	CC	G	So	1					1				X	X	X	X	X	X	X	
3	SW-A27(2.0-2.5)		2/26/19	0955	CC	G	So	1					1				X	X	X	X	X	X	X	
4	SW-A28(0.0-0.5)		2/26/19	1005	CC	G	So	1					1				X	X	X	X	X	X	X	D14
5	SW-A28(2.0-2.5)		2/26/19	1015	CC	G	So	1					1				X	X	X	X	X	X	X	A39
6	SW-A29(0.0-0.5)		2/26/19	1025	CC	G	So	1					1				X	X	X	X	X	X	X	98
7	SW-A29(0.0-0.5)		2/26/19	1035	CC	G	So	1					1				X	X	X	X	X	X	X	
5	SW-A28(2.0-2.5) MS		2/26/19	1015	CC	G	So	1					1				X	X	X	X	X	X	X	
	SW-A28(2.0-2.5) MSD		2/26/19	1015	CC	G	So	1					1				X	X	X	X	X	X	X	
8	DUP-04(20190226)RR		--	--	CC	G	So	1					1				X	X	X	X	X	X	X	

Matrix Codes: DW - Drinking Water; GW - Ground Water; WW - Water; SW - Surface Water; SO - Soil; SL - Sludge; SED-Sediment; OI - Oil; LIQ - Other Liquid; AIR - Air; SOL - Other Solid; WP - Wipe; FB - Field Blank; EB-Equipment Blank; RB - Rinse Blank; TB - Trip Blank

Turn Around Time (Business Days)

Approved By (SGS PM) / Date:

- [ ] 10 Business Days
- [ ] 5 Business Days
- [ ] 3 Business Days*
- [x] 2 Business Days*
- [ ] 1 Business Day*
- [ ] Other

All data available via Lablink

* Approval needed for 1-3 Business Day TAT

Deliverable

- [ ] Commercial "A" (Level 1)
- [ ] Commercial "B" (Level 2)
- [ ] NJ Reduced (Level 3)
- [ ] Full Tier I (Level 4)
- [ ] Commercial "C"
- [ ] NJ DKQP
- [ ] NYASP Category A
- [ ] NYASP Category B
- [ ] MA MCP Criteria
- [ ] CT RCP Criteria
- [ ] State Forms
- [x] EDD Format _Equis_
- [ ] DOD-QSM5

Commercial "A" = Results only; Commercial "B" = Results + QC Summary
Commercial "C" = Results + QC Summary + Partial Raw data

Comments / Special Instructions

http://www.sgs.com/en/terms-and-conditions

Sample Custody must be documented below each time samples change possession, including courier delivery.

	Relinquished by:	Date / Time:	Received By:
1		2/26/19 1315	1
2	1	Date / Time: 2.26.19 1644	2
3	2	Date / Time:	3
4	3	Date / Time:	4
5	4	Date / Time:	5

Custody Seal # 31872 — Intact / Not Intact — Preserved where applicable / Absent — Therm. ID: IP — On Ice — Cooler Temp. °C: 3.2°C

INITIAL ASESSMENT LR 3A

LABEL VERIFICATION

SGS Post Ex Sample COCs Template 20190108

Report of Analysis

Client Sample ID:	FB(20190226)-A		
Lab Sample ID:	JC83434-1	**Date Sampled:**	02/26/19
Matrix:	AQ - Field Blank Soil	**Date Received:**	02/26/19
		Percent Solids:	n/a
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	< 0.010	0.010	mg/l	1	02/26/19 21:55	JO	SW846 7196A
Redox Potential Vs H2	730		mv	1	02/27/19 15:36	RI	ASTM D1498-76
pH [a]	5.89		su	1	02/26/19 17:10	AS	SM4500H+ B-11

(a) Sample received out of holding time for pH analysis.

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A27(0.0-0.5)		
Lab Sample ID:	JC83434-2	**Date Sampled:**	02/26/19
Matrix:	SO - Soil	**Date Received:**	02/26/19
		Percent Solids:	81.0
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	6.9 J	0.49	mg/kg	1	03/01/19 15:33	RI	SW846 3060A/7196A
Redox Potential Vs H2	607		mv	1	02/27/19 16:13	RI	ASTM D1498-76M
Solids, Percent	81		%	1	02/27/19 16:00	SF	SM2540 G 18TH ED MOD
pH	7.05		su	1	02/27/19 15:50	RI	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A27(2.0-2.5)		
Lab Sample ID:	JC83434-3	**Date Sampled:**	02/26/19
Matrix:	SO - Soil	**Date Received:**	02/26/19
		Percent Solids:	87.0
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	1.4 J	0.46	mg/kg	1	03/01/19 15:33	RI	SW846 3060A/7196A
Redox Potential Vs H2	354		mv	1	02/27/19 16:30	RI	ASTM D1498-76M
Solids, Percent	87		%	1	02/27/19 16:00	SF	SM2540 G 18TH ED MOD
pH	7.49		su	1	02/27/19 15:53	RI	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A28(0.0-0.5)		
Lab Sample ID:	JC83434-4	**Date Sampled:**	02/26/19
Matrix:	SO - Soil	**Date Received:**	02/26/19
		Percent Solids:	83.5
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	13.4 J	0.48	mg/kg	1	03/01/19 15:33	RI	SW846 3060A/7196A
Redox Potential Vs H2	529		mv	1	02/27/19 16:36	RI	ASTM D1498-76M
Solids, Percent	83.5		%	1	02/27/19 16:00	SF	SM2540 G 18TH ED MOD
pH	7.43		su	1	02/27/19 15:55	RI	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A28(2.0-2.5)		
Lab Sample ID:	JC83434-5	**Date Sampled:**	02/26/19
Matrix:	SO - Soil	**Date Received:**	02/26/19
		Percent Solids:	88.9
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	0.97 J	0.45	mg/kg	1	03/01/19 15:26	RI	SW846 3060A/7196A
Redox Potential Vs H2	310		mv	1	02/27/19 15:53	RI	ASTM D1498-76M
Solids, Percent	88.9		%	1	02/27/19 16:00	SF	SM2540 G 18TH ED MOD
pH	7.68		su	1	02/27/19 15:43	RI	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A29(0.0-0.5)		
Lab Sample ID:	JC83434-6	**Date Sampled:**	02/26/19
Matrix:	SO - Soil	**Date Received:**	02/26/19
		Percent Solids:	77.3
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	5.6 J	0.52	mg/kg	1	03/01/19 15:33	RI	SW846 3060A/7196A
Redox Potential Vs H2	450		mv	1	02/27/19 17:03	RI	ASTM D1498-76M
Solids, Percent	77.3		%	1	02/27/19 16:00	SF	SM2540 G 18TH ED MOD
pH	7.27		su	1	02/27/19 16:01	RI	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A29(2.0-2.5)		
Lab Sample ID:	JC83434-7	**Date Sampled:**	02/26/19
Matrix:	SO - Soil	**Date Received:**	02/26/19
		Percent Solids:	86.1
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	0.82 J	0.46	mg/kg	1	03/01/19 15:33	RI	SW846 3060A/7196A
Redox Potential Vs H2	323		mv	1	02/27/19 17:16	RI	ASTM D1498-76M
Solids, Percent	86.1		%	1	02/27/19 16:00	SF	SM2540 G 18TH ED MOD
pH	7.18		su	1	02/27/19 16:05	RI	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID:	DUP-04(20190226)RR		
Lab Sample ID:	JC83434-8	**Date Sampled:**	02/26/19
Matrix:	SO - Soil	**Date Received:**	02/26/19
		Percent Solids:	85.9
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	< 0.47 UJ	0.47	mg/kg	1	03/01/19 15:33	RI	SW846 3060A/7196A
Redox Potential Vs H2	322		mv	1	02/27/19 17:19	RI	ASTM D1498-76M
Solids, Percent	85.9		%	1	02/27/19 16:00	SF	SM2540 G 18TH ED MOD
pH	7.31		su	1	02/27/19 16:07	RI	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A27(0.0-0.5)		
Lab Sample ID:	JC83434-2R	**Date Sampled:**	02/26/19
Matrix:	SO - Soil	**Date Received:**	02/26/19
		Percent Solids:	81.0
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	79.9	2.5	mg/kg	5	03/09/19 14:01	RI	SW846 3060A/7196A

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A27(2.0-2.5)		
Lab Sample ID:	JC83434-3R	**Date Sampled:**	02/26/19
Matrix:	SO - Soil	**Date Received:**	02/26/19
		Percent Solids:	87.0
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	34.3	0.46	mg/kg	1	03/09/19 14:01	RI	SW846 3060A/7196A

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A28(0.0-0.5)		
Lab Sample ID:	JC83434-4R	**Date Sampled:**	02/26/19
Matrix:	SO - Soil	**Date Received:**	02/26/19
		Percent Solids:	83.5
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	3.2	0.48	mg/kg	1	03/09/19 14:01	RI	SW846 3060A/7196A

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A28(2.0-2.5)		
Lab Sample ID:	JC83434-5R	**Date Sampled:**	02/26/19
Matrix:	SO - Soil	**Date Received:**	02/26/19
		Percent Solids:	88.9
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	0.92	0.45	mg/kg	1	03/09/19 13:57	RI	SW846 3060A/7196A

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A29(0.0-0.5)		
Lab Sample ID:	JC83434-6R	**Date Sampled:**	02/26/19
Matrix:	SO - Soil	**Date Received:**	02/26/19
		Percent Solids:	77.3
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	5.3	0.52	mg/kg	1	03/09/19 14:01	RI	SW846 3060A/7196A

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A29(2.0-2.5)		
Lab Sample ID:	JC83434-7R	**Date Sampled:**	02/26/19
Matrix:	SO - Soil	**Date Received:**	02/26/19
		Percent Solids:	86.1
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	< 0.46	0.46	mg/kg	1	03/09/19 14:01	RI	SW846 3060A/7196A

RL = Reporting Limit

Report of Analysis

Client Sample ID:	DUP-04(20190226)RR		
Lab Sample ID:	JC83434-8R	**Date Sampled:**	02/26/19
Matrix:	SO - Soil	**Date Received:**	02/26/19
		Percent Solids:	85.9
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	0.49	0.47	mg/kg	1	03/09/19 14:01	RI	SW846 3060A/7196A

RL = Reporting Limit

Report of Analysis

Client Sample ID: FB(20190226)-A
Lab Sample ID: JC83434-1A
Matrix: AQ - Field Blank Soil
Project: PPG Site 107, 18 Chapel Avenue, Jersey City, NJ

Date Sampled: 02/26/19
Date Received: 02/26/19
Percent Solids: n/a

Total Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 6.0	6.0	ug/l	1	02/27/19	02/27/19	ND	SW846 6010D [1]	SW846 3010A [2]
Chromium	< 10	10	ug/l	1	02/27/19	02/27/19	ND	SW846 6010D [1]	SW846 3010A [2]
Nickel	< 10	10	ug/l	1	02/27/19	02/27/19	ND	SW846 6010D [1]	SW846 3010A [2]
Thallium	< 10	10	ug/l	1	02/27/19	02/27/19	ND	SW846 6010D [1]	SW846 3010A [2]
Vanadium	< 50	50	ug/l	1	02/27/19	02/27/19	ND	SW846 6010D [1]	SW846 3010A [2]

(1) Instrument QC Batch: MA46218
(2) Prep QC Batch: MP12750

RL = Reporting Limit

Report of Analysis

Client Sample ID:	FB(20190226)-A		
Lab Sample ID:	JC83434-1A	**Date Sampled:**	02/26/19
Matrix:	AQ - Field Blank Soil	**Date Received:**	02/26/19
		Percent Solids:	n/a
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	< 0.020	0.020	mg/l	1	02/27/19 16:19	ND	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A27(0.0-0.5)		
Lab Sample ID:	JC83434-2A	**Date Sampled:**	02/26/19
Matrix:	SO - Soil	**Date Received:**	02/26/19
		Percent Solids:	81.0
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	4.5 J-	2.4	mg/kg	1	02/26/19	02/27/19	ND	SW846 6010D [1]	SW846 3050B [2]
Chromium	286	1.2	mg/kg	1	02/26/19	02/27/19	ND	SW846 6010D [1]	SW846 3050B [2]
Nickel	42.0	4.8	mg/kg	1	02/26/19	02/27/19	ND	SW846 6010D [1]	SW846 3050B [2]
Thallium [a]	< 2.4	2.4	mg/kg	2	02/26/19	02/27/19	ND	SW846 6010D [1]	SW846 3050B [2]
Vanadium	40.5	6.1	mg/kg	1	02/26/19	02/27/19	ND	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA46218
(2) Prep QC Batch: MP12752

(a) Elevated detection limit due to dilution required for high interfering element.

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A27(0.0-0.5)		
Lab Sample ID:	JC83434-2A	**Date Sampled:**	02/26/19
Matrix:	SO - Soil	**Date Received:**	02/26/19
		Percent Solids:	81.0
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	279	1.7	mg/kg	1	03/01/19 15:33	RI	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A27(2.0-2.5)		
Lab Sample ID:	JC83434-3A	**Date Sampled:**	02/26/19
Matrix:	SO - Soil	**Date Received:**	02/26/19
		Percent Solids:	87.0
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 2.4 UJ-	2.4	mg/kg	1	02/26/19	02/27/19	ND	SW846 6010D [1]	SW846 3050B [2]
Chromium	16.6	1.2	mg/kg	1	02/26/19	02/27/19	ND	SW846 6010D [1]	SW846 3050B [2]
Nickel	14.3	4.7	mg/kg	1	02/26/19	02/27/19	ND	SW846 6010D [1]	SW846 3050B [2]
Thallium	< 1.2	1.2	mg/kg	1	02/26/19	02/27/19	ND	SW846 6010D [1]	SW846 3050B [2]
Vanadium	23.5	5.9	mg/kg	1	02/26/19	02/27/19	ND	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA46218
(2) Prep QC Batch: MP12752

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A27(2.0-2.5)		
Lab Sample ID:	JC83434-3A	**Date Sampled:**	02/26/19
Matrix:	SO - Soil	**Date Received:**	02/26/19
		Percent Solids:	87.0
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	15.2	1.7	mg/kg	1	03/01/19 15:33	RI	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID: SW-A28(0.0-0.5)
Lab Sample ID: JC83434-4A
Matrix: SO - Soil
Project: PPG Site 107, 18 Chapel Avenue, Jersey City, NJ

Date Sampled: 02/26/19
Date Received: 02/26/19
Percent Solids: 83.5

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 2.3 UJ-	2.3	mg/kg	1	02/26/19	02/27/19	ND	SW846 6010D [1]	SW846 3050B [2]
Chromium	227	1.2	mg/kg	1	02/26/19	02/27/19	ND	SW846 6010D [1]	SW846 3050B [2]
Nickel	24.3	4.7	mg/kg	1	02/26/19	02/27/19	ND	SW846 6010D [1]	SW846 3050B [2]
Thallium	< 1.2	1.2	mg/kg	1	02/26/19	02/27/19	ND	SW846 6010D [1]	SW846 3050B [2]
Vanadium	41.3	5.8	mg/kg	1	02/26/19	02/27/19	ND	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA46218
(2) Prep QC Batch: MP12752

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A28(0.0-0.5)		
Lab Sample ID:	JC83434-4A	**Date Sampled:**	02/26/19
Matrix:	SO - Soil	**Date Received:**	02/26/19
		Percent Solids:	83.5
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	214	1.7	mg/kg	1	03/01/19 15:33	RI	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A28(2.0-2.5)		
Lab Sample ID:	JC83434-5A	**Date Sampled:**	02/26/19
Matrix:	SO - Soil	**Date Received:**	02/26/19
		Percent Solids:	88.9
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 2.1 UJ-	2.1	mg/kg	1	02/26/19	02/27/19	ND	SW846 6010D [1]	SW846 3050B [2]
Chromium	15.3	1.1	mg/kg	1	02/26/19	02/27/19	ND	SW846 6010D [1]	SW846 3050B [2]
Nickel	13.1	4.3	mg/kg	1	02/26/19	02/27/19	ND	SW846 6010D [1]	SW846 3050B [2]
Thallium	< 1.1	1.1	mg/kg	1	02/26/19	02/27/19	ND	SW846 6010D [1]	SW846 3050B [2]
Vanadium	25.1	5.4	mg/kg	1	02/26/19	02/27/19	ND	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA46218
(2) Prep QC Batch: MP12752

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A28(2.0-2.5)		
Lab Sample ID:	JC83434-5A	**Date Sampled:**	02/26/19
Matrix:	SO - Soil	**Date Received:**	02/26/19
		Percent Solids:	88.9
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	14.3	1.6	mg/kg	1	03/01/19 15:26	RI	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A29(0.0-0.5)		
Lab Sample ID:	JC83434-6A	**Date Sampled:**	02/26/19
Matrix:	SO - Soil	**Date Received:**	02/26/19
		Percent Solids:	77.3
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	4.1 J-	2.5	mg/kg	1	02/26/19	02/27/19	ND	SW846 6010D [1]	SW846 3050B [2]
Chromium	146	1.2	mg/kg	1	02/26/19	02/27/19	ND	SW846 6010D [1]	SW846 3050B [2]
Nickel	23.7	4.9	mg/kg	1	02/26/19	02/27/19	ND	SW846 6010D [1]	SW846 3050B [2]
Thallium [a]	< 2.5	2.5	mg/kg	2	02/26/19	02/27/19	ND	SW846 6010D [1]	SW846 3050B [2]
Vanadium	29.8	6.2	mg/kg	1	02/26/19	02/27/19	ND	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA46218
(2) Prep QC Batch: MP12752

(a) Elevated detection limit due to dilution required for high interfering element.

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A29(0.0-0.5)		
Lab Sample ID:	JC83434-6A	**Date Sampled:**	02/26/19
Matrix:	SO - Soil	**Date Received:**	02/26/19
		Percent Solids:	77.3
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	140	1.7	mg/kg	1	03/01/19 15:33	RI	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A29(2.0-2.5)		
Lab Sample ID:	JC83434-7A	**Date Sampled:**	02/26/19
Matrix:	SO - Soil	**Date Received:**	02/26/19
		Percent Solids:	86.1
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 2.2 UJ-	2.2	mg/kg	1	02/26/19	02/27/19	ND	SW846 6010D [1]	SW846 3050B [2]
Chromium	17.2	1.1	mg/kg	1	02/26/19	02/27/19	ND	SW846 6010D [1]	SW846 3050B [2]
Nickel	12.0	4.5	mg/kg	1	02/26/19	02/27/19	ND	SW846 6010D [1]	SW846 3050B [2]
Thallium	< 1.1	1.1	mg/kg	1	02/26/19	02/27/19	ND	SW846 6010D [1]	SW846 3050B [2]
Vanadium	22.3	5.6	mg/kg	1	02/26/19	02/27/19	ND	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA46218
(2) Prep QC Batch: MP12752

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A29(2.0-2.5)		
Lab Sample ID:	JC83434-7A	**Date Sampled:**	02/26/19
Matrix:	SO - Soil	**Date Received:**	02/26/19
		Percent Solids:	86.1
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	16.4	1.6	mg/kg	1	03/01/19 15:33	RI	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	DUP-04(20190226)RR		
Lab Sample ID:	JC83434-8A	**Date Sampled:**	02/26/19
Matrix:	SO - Soil	**Date Received:**	02/26/19
		Percent Solids:	85.9
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 2.2 UJ-	2.2	mg/kg	1	02/26/19	02/27/19	ND	SW846 6010D [1]	SW846 3050B [2]
Chromium	20.2	1.1	mg/kg	1	02/26/19	02/27/19	ND	SW846 6010D [1]	SW846 3050B [2]
Nickel	12.1	4.4	mg/kg	1	02/26/19	02/27/19	ND	SW846 6010D [1]	SW846 3050B [2]
Thallium	< 1.1	1.1	mg/kg	1	02/26/19	02/27/19	ND	SW846 6010D [1]	SW846 3050B [2]
Vanadium	22.8	5.5	mg/kg	1	02/26/19	02/27/19	ND	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA46218
(2) Prep QC Batch: MP12752

RL = Reporting Limit

Report of Analysis

Client Sample ID:	DUP-04(20190226)RR		
Lab Sample ID:	JC83434-8A	**Date Sampled:**	02/26/19
Matrix:	SO - Soil	**Date Received:**	02/26/19
		Percent Solids:	85.9
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	20.2	1.6	mg/kg	1	03/01/19 15:33	RI	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

ARCADIS Design & Consultancy for natural and built assets

PPG Industries

DATA QUALITY ASSESSMENT

Site 107 Fashionland

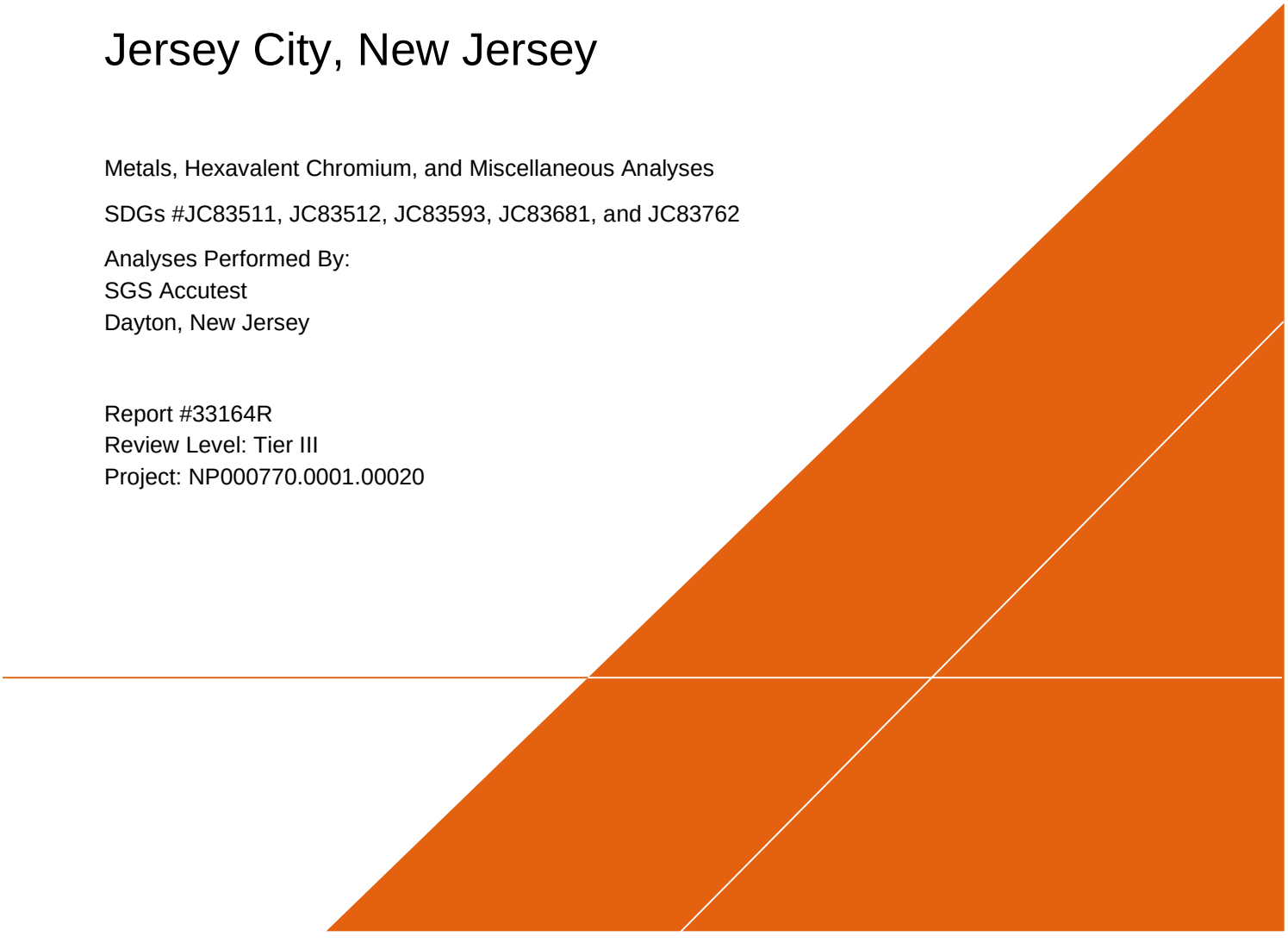
Jersey City, New Jersey

Metals, Hexavalent Chromium, and Miscellaneous Analyses

SDGs #JC83511, JC83512, JC83593, JC83681, and JC83762

Analyses Performed By:
SGS Accutest
Dayton, New Jersey

Report #33164R
Review Level: Tier III
Project: NP000770.0001.00020



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Groups (SDGs) # JC83511, JC83512, JC83593, JC83681, and JC83762 for samples collected in association with the PPG Industries Site 107 Fashionland, Jersey City, New Jersey Site. The review was conducted as a Tier III evaluation and included review of data package completeness. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

SDG	Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis		
						Cr VI	MET	MISC
JC83511	FB(20190227)-A	JC83511-1	Water	2/27/2019		X	X	X
	SW-A22(0.0-0.5)	JC83511-2	Soil	2/27/2019		X	X	X
	SW-A22(2.0-2.5)	JC83511-2	Soil	2/27/2019		X	X	X
	SW-A23(0.0-0.5)	JC83511-4	Soil	2/27/2019		X	X	X
	SW-A23(2.0-2.5)	JC83511-5	Soil	2/27/2019		X	X	X
	107_M024N_1	JC83511-6	Soil	2/27/2019		X	X	X
	107_M034N	JC83511-7	Soil	2/27/2019		X	X	X
JC83512	FB(20190227)	JC83512-1	Water	2/27/2019		X	X	X
	107_K032	JC83512-2	Soil	2/27/2019		X	X	X
	BS-C17S	JC83512-3	Soil	2/27/2019		X	X	X
JC83593	FB(20190228)	JC83593-1	Water	2/28/2019		X	X	X
	BS-C17TT	JC83593-2	Soil	2/28/2019		X	X	X
JC83681	FB(20190301)	JC83681-1	Water	3/1/2019		X	X	X
	BS-B2	JC83681-2	Soil	3/1/2019		X	X	X
	BS-D18	JC83681-3	Soil	3/1/2019		X	X	X
	BS-D17T	JC83681-4	Soil	3/1/2019		X	X	X
JC83762	FB(20190304)	JC83762-1	Water	3/4/2019		X	X	X
	BS-E18	JC83762-2	Soil	3/4/2019		X	X	X
	BS-E17	JC83762-3	Soil	3/4/2019		X	X	X
	CS-F18	JC83762-4	Soil	3/4/2019		X	X	X

Notes:

1. Metals include antimony, chromium, nickel, thallium, and vanadium. Trivalent chromium is reported by calculation (Chromium) – (Hexavalent Chromium).
2. Cr VI is hexavalent chromium.
3. Miscellaneous parameters include pH and redox potential.

4. SDGs #JC83511, JC83512, JC83593, JC83681, and JC83762: Miscellaneous parameters for sample SW-A23(0.0-0.5), BS-C17S, BS-C17TT, BS-B2, and BS-E18 also include ferrous iron, sulfide screen, and total organic carbon (TOC).

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of QA or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

Note:
QA - Quality Assurance

INORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Methods 6010C, 7196A, and 9045D; Standard Methods (SM) 4500H+B and SM4500S2-A; Lloyd Kahn; and ASTM D1498-76 and D3872-86. Data were reviewed in accordance with USEPA Region 2 SOP HW-2b, Revision 15 (December 2012); New Jersey Division of Remediation Management and Response Standard Operating Procedure for Analytical Data Validation of Hexavalent Chromium (September 2009); New Jersey Department of Environmental Protection Data Quality Assessment and Data Usability Evaluation Technical Guidance (April 2014); Field Sampling Plan/Quality Assurance Project Plan, PPG Non-Residential and Residential Chromium Sites, Hudson County, New Jersey (AECOM, June 2010); and Arcadis Quality Assurance Project Plan – Addendum, Site 107 Fashionland, Jersey City, New Jersey (Arcadis, June 2018).

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and that it was already subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with the USEPA National Functional Guidelines:

- Concentration (C) Qualifiers
  - U The analyte was analyzed for but not detected. The associated value is the analyte instrument detection limit.
  - B The reported value was obtained from a reading less than the reporting limit (RL), but greater than or equal to the method detection limit (MDL).
- Quantitation (Q) Qualifiers
  - E The reported value is estimated due to the presence of interference.
  - N Spiked sample recovery is not within control limits.
  - * Duplicate analysis is not within control limits.
- Validation Qualifiers
  - J The analyte was positively identified; however, the associated numerical value is an estimated concentration only.
  - J+ The result is an estimated quantity, but the result may be biased high.
  - J- The result is an estimated quantity, but the result may be biased low.
  - UJ The analyte was not detected above the reporting limit. However, the reported limit is approximate and may or may not represent the actual limit of detection.
  - UB Analyte considered non-detect at the listed value due to associated blank contamination.
  - R The data are unusable. The sample results are rejected due to serious deficiencies in meeting Quality Control (QC) criteria. The analyte may or may not be present in the sample.

RA The result was rejected due to deficiencies but is considered usable for decision-making purposes.

Two facts should be noted by all data users. First, the “R” flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. “R” values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

METALS ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 6010C	Water	180 days from collection to analysis	Preserved to a pH of less than 2; Cool to <6°C
	Soil	180 days from collection to analysis	Cool to <6°C

All samples were analyzed within the specified holding times.

2. Blank Contamination

Quality assurance (QA) blanks (i.e., method and rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank is calculated for QA blanks containing concentrations greater than the method detection limit (MDL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Analytes were not detected above the MDL in the associated blanks; therefore, detected sample results were not associated with blank contamination.

3. Calibration

Satisfactory instrument calibration is established to provide that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument's continuing performance is satisfactory.

3.1 Initial Calibration and Continuing Calibration

The correct number and type of standards were analyzed. The correlation coefficient of the initial calibration was greater than 0.998 and all initial calibration verification standard and continuing calibration verification standard recoveries were within control limits of 90% to 110%.

All continuing calibration verification standard recoveries were within the control limit.

3.2 Low-Level Calibration Verification

The low-level initial and continuing calibration check standard serves to verify the linearity of calibration of the analysis at the reporting limit.

All RL standard recoveries were within control limits of 70% to 130% (50% to 150% for antimony and thallium).

3.3 ICP Interference Control Sample (ICS)

The ICS verifies the laboratories interelement and background correction factors.

All ICS exhibited recoveries within the control limits of 80% to 120%.

4. Matrix Spike/Matrix Spike Duplicate (MS/MSD)/Laboratory Duplicate Analysis

MS/MSD and laboratory duplicate data are used to assess the precision and accuracy of the analytical method.

4.1 MS/MSD Analysis

All metal analytes must exhibit a percent recovery within the established acceptance limits of 75% to 125%. The MS/MSD recovery control limits do not apply for MS/MSD performed on sample locations where the analyte's concentration detected in the parent sample exceeds the MS/MSD concentration by a factor of four or greater.

The MS/MSD analysis was not performed using a sample from these SDGs.

4.2 Laboratory Duplicate Analysis

The laboratory duplicate relative percent difference (RPD) criterion is applied when parent and duplicate sample concentrations are greater than or equal to 5 times the RL. A control limit of 20% for water matrices and 35% for soil matrices is applied when the criteria above is true. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of ± the RL is applied.

The laboratory duplicate analysis was not performed using a sample from these SDGs.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 50% for soil matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of three times the RL is applied for soil matrices.

A field duplicate sample was not collected in association with these SDGs.

6. Laboratory Control Sample (LCS) Analysis

The LCS analysis is used to assess the accuracy of the analytical method independent of matrix interferences. The analytes associated with the LCS analysis must exhibit a percent recovery between the control limits of 80% and 120%.

The LCS analysis exhibited recoveries and RPDs within the control limits.

7. Serial Dilution

The serial dilution analysis is used to assess if a significant physical or chemical interference exists due to sample matrix. Analytes exhibiting concentrations greater than 10 times the RL in the undiluted sample are evaluated to determine if matrix interference exists. These analytes are required to have less than a

10% difference (%D) between sample results from the undiluted (parent) sample and results associated with the same sample analyzed with a five-fold dilution.

The serial dilution analysis was not performed using a sample from these SDGs.

8. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR METALS

METALS: SW-846 6010C	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Inductively Coupled Plasma-Atomic Emission Spectrometry (ICP-AES)					
Tier II Validation					
Holding Times		X		X	
Reporting limits (units)		X		X	
Blanks					
A. Instrument Blanks		X		X	
B. Method Blanks		X		X	
C. Equipment/Field Blanks		X		X	
Laboratory Control Sample (LCS)		X		X	
Laboratory Control Sample Duplicate (LCSD)	X				X
LCS/LCSD Precision (RPD)	X				X
Matrix Spike (MS) %R	X				X
Matrix Spike Duplicate (MSD) %R	X				X
MS/MSD Precision (RPD)	X				X
Field/Lab Duplicate (RPD)	X				X
ICP Serial Dilution %D	X				X
Total vs. Dissolved	X				X
Reporting Limit Verification		X		X	
Tier III Validation					
Initial Calibration Verification		X		X	
Continuing Calibration Verification		X		X	
CRDL Standard Recovery		X		X	
ICP Interference Check		X		X	
ICP-MS Internal Standards	X				X
Transcription/calculations acceptable		X		X	
Raw Data	X				X
Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%R Percent recovery

RPD Relative percent difference

%D Percent difference

HEXAVALENT CHROMIUM ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 7196A	Water	24 hours from collection to analysis	Cool to <6°C
SW-846 3060A/ 7196A	Soil	30 days from collection to extraction; 7 days from extraction to analysis	Cool to <6°C

All samples were analyzed within the specified holding times.

2. Blank Contamination

Quality assurance (QA) blanks (i.e., method and rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank is calculated for QA blanks containing concentrations greater than the method detection limit (MDL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Analytes were not detected above the MDL in the associated blanks; therefore, detected sample results were not associated with blank contamination.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

The correct number and type of standards were analyzed. The correlation coefficient of the initial calibration was greater than 0.995 and all calibration verification standard recoveries were within control limits of 90% to 110%.

4. Matrix Spike (MS)/Post-Digestion Spike (PDS)/Laboratory Duplicate Analysis

MS, PDS, and laboratory duplicate data are used to assess the precision and accuracy of the analytical method.

4.1 MS Analysis

Soluble and insoluble spike sample analyses are designed to provide information about the effect of the sample matrix on the digestion and measurement methodology. The insoluble spike is used to evaluate the dissolution during the digestion process. Hexavalent chromium must exhibit a percent recovery within

the established acceptance limits of 75% to 125% in both the soluble and insoluble spiked analyses. The control limits do not apply when the parent sample concentration exceeds the spike amount by a factor of four or greater.

SDGs #JC83511, JC83512, JC83681, and JC83762: The MS analysis performed on sample locations SW-A23(0.0-0.5), BS-C17S, BS-B2, and BS-E18 in association with the insoluble hexavalent chromium analysis exhibited recoveries within the control limits.

SDGs #JC83511, JC83512, JC83593, JC83681, and JC83762: The MS analysis performed on sample locations SW-A23(0.0-0.5), BS-C17S, BS-C17TT, BS-B2, and BS-E18 exhibited spike recoveries less than the lower control limits as presented in the table below.

Sample Location	Analyte	Initial Spike Recovery	Reanalysis Spike Recovery
SW-A23(0.0-0.5)	Hexavalent Chromium, Soluble	60.4%	< 50%
BS-C17S	Hexavalent Chromium, Soluble	< 50%	> 125%
BS-C17TT	Hexavalent Chromium, Insoluble	< 50%	< 50%
	Hexavalent Chromium, Soluble	< 50%	< 50%
BS-B2	Hexavalent Chromium, Soluble	71.8%	55.4%
BS-E18	Hexavalent Chromium, Soluble	< 50%	< 50%

The criteria used to evaluate spike recoveries are presented in the following table. The qualifications are applied to all sample results associated with the sample preparation batch. In the event of a recovery outside of the control limits, the MS must be reanalyzed.

Control limit	Sample Result	Qualification[1]
Spike recovery ≥ 50% but < 75%	Non-detect	UJ-
	Detect	J-
Spike recovery < 50%	Non-detect	R/RA
	Detect	R/RA
Spike recovery > 125%	Non-detect	No Action
Spike recovery > 125% but ≤ 150%	Detect	J+
Spike recovery > 150%	Detect	R

Notes:

[1] If recoveries are < 50% or > 150% for both insoluble and soluble spikes, associated data will be rejected ("R"); otherwise qualify associated data if one of the spikes is outside the < 50% or > 150% limits.

SDGs #JC83511, JC83512, JC83681, and JC83762: The original analyses of the field samples are usable with appropriate qualification. No sample results were rejected.

SDG #JC83593: Consistent with practices on the PPG remediation program, since the source sample used for MS analysis exhibited a reducing environment, both detected and non-detected hexavalent chromium results were determined to be rejected but acceptable for use ("RA" qualifier).

4.2 Post-Digestion Spike (PDS) Analysis

The PDS analysis is designed to verify that neither a reducing condition nor a chemical interference is affecting the analysis. This is accomplished by analyzing a second aliquot of the pH-adjusted filtrate that has been spiked with hexavalent chromium. The PDS must exhibit a percent recovery within the method acceptance limits of 85% to 115%.

SDGs #JC83511, JC83593, and JC83681: The PDS analysis performed on sample location SW-A23(0.0-0.5), BS-C17TT, and BS-B2 exhibited recoveries within the control limits.

SDGs #JC83512 and JC83762: The PDS analysis performed on sample locations BS-C17S exhibited a recovery outside of the control limits as presented in the table below.

Sample Location	Analyte	PDS Recovery	Reanalysis PDS Recovery
BS-C17S	Hexavalent Chromium	< 85%	AC (102%)
BS-E18	Hexavalent Chromium	< 85%	< 85%

Notes:

AC = Acceptable

Since all the samples are from the same site, it is assumed the matrix interference exists for all samples in a reducing environment. It was noted from the Eh pH results that soil samples are in a reducing environment and don't support the presence of hexavalent chromium.

The criteria used to evaluate spike recoveries are presented in the following table. The qualifications are applied to all sample results associated with the sample preparation batch.

Control limit	Sample Result	Qualification
PDS recovery < 85%	Non-detect	UJ-
	Detect	J-
PDS recovery > 115%	Non-detect	No Action
PDS recovery > 115%	Detect	J+

4.3 Laboratory Duplicate Analysis

The laboratory duplicate relative percent difference (RPD) criterion is applied when parent and duplicate sample concentrations are greater than or equal to four times the RL. A control limit of 20% is applied when the criteria above is true. In the instance when the parent and/or duplicate sample concentrations are less than or equal to four times the RL, a control limit of ± the RL is used.

SDGs #JC83512, JC83593, and JC83681: The laboratory duplicate analysis performed on sample locations BS-C17S, BS-C17TT, and BS-B2 exhibited results within the control limit.

SDGs #JC83511 and JC83762: All analytes associated with laboratory duplicate were within the control limit, with the exception of the analytes presented in the following table.

Sample Location	Analytes	Laboratory Duplicate RPD
SW-A23(0.0-0.5)	Hexavalent Chromium	32.7%
BS-E18	Hexavalent Chromium	> ± RL

The criteria used to evaluate laboratory duplicate RPD are presented in the following table. In the case of a laboratory duplicate RPD deviation, the sample results are qualified. The qualifications are applied to all sample results associated with the sample preparation batch.

Sample Concentration	Control Limit	Sample Result	Qualification
Parent sample and/or laboratory duplicate sample result > four times the RL	> 20%	Non-detect	UJ
		Detect	J
Parent sample and/or laboratory duplicate sample result < four times the RL	± RL	Non-detect	UJ
		Detect	J

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 50% for soil matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of three times the RL is applied for soil matrices.

A field duplicate sample was not collected in association with these SDGs.

6. Laboratory Control Sample (LCS) Analysis

The LCS analysis is used to assess the precision and accuracy of the analytical method independent of matrix interferences. The analytes associated with the LCS analysis must exhibit a percent recovery between the control limits of 80% and 120%.

The LCS analysis exhibited recoveries within the control limits.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR HEXAVALENT CHROMIUM

HEXAVALENT CHROMIUM: SW-846 7196A	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Spectrophotometer					
Tier II Validation					
Holding Times		X		X	
Reporting limits (units)		X		X	
Blanks					
A. Instrument Blanks		X		X	
B. Method Blanks		X		X	
C. Equipment/Field Blanks		X		X	
Laboratory Control Sample (LCS)		X		X	
Matrix Spike (MS) %R		X	X		
Matrix Spike Duplicate (MSD) %R	X				X
MS/MSD Precision (RPD)	X				X
Post Digestion Spike %R		X	X		
Field/Lab Duplicate (RPD)		X	X		
Dilution Factor		X		X	
Tier III Validation					
Initial calibration %RSD or correlation coefficient		X		X	
Continuing calibration %R		X		X	
Raw Data		X		X	
Transcription/calculation errors present		X		X	
Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%R Percent recovery

RPD Relative percent difference

%RSD Relative percent deviation

GENERAL CHEMISTRY ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
pH by SM4500H+B	Water	QAPP: 24 hours of receipt at laboratory	Cool to <6°C
pH by SW846 9045D	Soil	QAPP: 24 hours of receipt at laboratory	Cool to <6°C
Oxidation-Reduction Potential by ASTM D1498-76	Water	Not applicable	Cool to <6°C
Oxidation-Reduction Potential (Redox) by ASTM D1498-76	Soil	Measure immediately after creating leachate	Cool to <6°C
Ferrous Iron by ASTM D3872-86	Soil	24 hours from collection to analysis	Cool to <6°C
Sulfide Screen by SM4500S2-A	Soil	7 days from collection to analysis	Cool to <6°C
Total Organic Carbon (TOC) by Lloyd Kahn	Soil	14 days from collection to analysis	Cool to <6°C

The analyses that exceeded the holding are presented in the following table.

Sample Locations	Method	Holding Time	Criteria
BS-C17TT BS-E18 BS-E17 CS-F18	SW846 9045D	Analysis: 3 days	< 24 hours of receipt by laboratory
BS-B2 BS-D18 BS-D17T		Analysis: 6 days	
SW-A23(0.0-0.5)	ASTM D3872-86	Analysis: 24 days	< 24 hours from collection
BS-E18		Analysis: 25 days	
BS-B2		Analysis: 28 days	
BS-C17TT		Analysis: 29 days	
BS-C17S		Analysis: 30 days	
SW-A23(0.0-0.5)	SM4500S2-A	Analysis: 24 days	< 7 days from collection
BS-E18		Analysis: 25 days	
BS-B2		Analysis: 28 days	
BS-C17TT		Analysis: 29 days	

Sample Locations	Method	Holding Time	Criteria
BS-C17S		Analysis: 30 days	
SW-A23(0.0-0.5) BS-C17S	Lloyd Kahn	Analysis: 23 days	< 14 days from collection
BS-E18		Analysis: 25 days	
BS-B2		Analysis: 28 days	
BS-C17TT		Analysis: 29 days	

Sample results were qualified as specified in the table below. All other holding times were met.

Criteria	Qualification	
	Detected Analytes	Non-detect Analytes
Analysis completed less than two times holding time	J	UJ
Analysis completed greater than two times holding time	J	R

2. Blank Contamination

Quality assurance (QA) blanks (i.e., method and rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank is calculated for QA blanks containing concentrations greater than the method detection limit (MDL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Method blank analysis is not applicable for Redox and pH analyses.

SDGs #JC83511, JC83512, and JC83593: TOC was detected in the associated method blank; however, the associated sample results were greater than the BAL. No qualification of the sample results was required.

SDGs #JC83681 and JC83762: Ferrous iron, sulfide, and TOC were not detected above the MDL in the associated blanks; therefore, detected sample results were not associated with blank contamination.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

The correct number and type of standards were analyzed. All buffer check results were within acceptance limits.

4. Laboratory Duplicate Analysis

Laboratory duplicate data are used to assess the precision of the analytical method. The laboratory duplicate relative percent difference (RPD) criterion is applied when parent and duplicate sample concentrations are greater than or equal to 5 times the RL. A control limit of 20% for water matrices and 35% for soil matrices is applied when the criteria above is true. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of ± the RL is applied.

SDGs #JC83511: The laboratory duplicate analysis performed on sample locations SW-A22(0.0-0.5) exhibited results within the control limit.

SDGs #JC83512, JC83593, JC83681, and JC83762: The laboratory duplicate analysis was not performed using a sample from these SDGs.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 50% for soil matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of three times the RL is applied for soil matrices.

A field duplicate sample was not collected in association with these SDGs.

6. Laboratory Control Sample (LCS) Analysis

The LCS analysis is used to assess the precision and accuracy of the analytical method independent of matrix interferences. The analytes associated with the LCS analysis must exhibit a percent recovery between the control limits of 80% and 120%.

LCS results for redox potential, pH, and sulfide screen were not reported in the analytical report.

The LCS analysis performed in association with ferrous iron and TOC exhibited recoveries within the control limits.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR GENERAL CHEMISTRY

General Chemistry: SM4500H+B, SW846 9045D, ASTM D1498-76	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Miscellaneous Instrumentation					
Tier II Validation					
Holding times		X	X		
Reporting limits (units)		X		X	
Blanks					
A. Instrument Blanks		X		X	
B. Method blanks		X		X	
C. Equipment blanks		X		X	
Laboratory Control Sample (LCS) %R		X		X	
Laboratory Control Sample Duplicate (LCSD) %R	X				X
LCS/LCSD Precision (RPD)	X				X
Matrix Spike (MS) %R	X				X
Matrix Spike Duplicate (MSD) %R	X				X
MS/MSD Precision (RPD)	X				X
Field/Lab Duplicate (RPD)		X		X	
Dilution Factor		X		X	
Tier III Validation					
Initial calibration %RSD or correlation coefficient	X				X
Continuing calibration %R	X				X
Raw Data		X		X	
Transcription/calculation errors present		X		X	
Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%R Percent recovery

RPD Relative percent difference

VALIDATION PERFORMED BY: Jennifer Singer

SIGNATURE: 

DATE: June 20, 2019

PEER REVIEW: Dennis Capria

DATE: July 12, 2019

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

SGS

SO FB

CHAIN OF CUSTODY

SGS North America Inc. - Dayton
2235 Route 130, Dayton, NJ 08810
TEL. 732-329-0200 FAX 732-329-3499
www.sgs.com/ehsusa

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E

FED-EX Tracking #: | Bottle Order Control #:
SGS Quote #: | SGS Job #: JC83511

Client / Reporting Information

Company Name: Arcadis
Street Address: 10 Friends Lane, Suite 200
City: Newtown | State: PA | Zip: 18940
Project Contact: Matthew Bell | E-mail:
Phone #: 610-755-7080 | Fax #:
Sampler(s) Name(s): C Cifelli | Phone #:

Project Information

Project Name: PPG Site 107 (Jersey City)
Street: 18 Chapel Avenue
City: Jersey City | State: NJ
Project #: NP000770.0003
Client Purchase Order #:
Project Manager: Jim McLaughlin, Jr.

Billing Information (if different from Report to)

Company Name:
Street Address:
City: State: Zip:
Attention:

Requested Analysis (see TEST CODE sheet)

Matrix Codes: DW - Drinking Water; GW - Ground Water; WW - Water; SW - Surface Water; SO - Soil; SL- Sludge; SED-Sediment; OI - Oil; LIQ - Other Liquid; AIR - Air; SOL - Other Solid; WP - Wipe; FB-Field Blank; EB-Equipment Blank; RB- Rinse Blank; TB-Trip Blank

Lab Sample #	Field ID / Point of Collection	MEOH/DI Vial #	Collection Date	Collection Time	Sampled by	Matrix	# of bottles	HCl	NaOH	HNO3	H2SO4	NONE	DI Water	MEOH	ENCORE	Total Chromium	Hexavalent Chromium	Trivalent Chromium	Antimony	Thallium	Nickel	Vanadium	LAB USE ONLY
1	FB(20190227)-A		2/27/19	1240	CC	FB	2			1		1				X	X	X	X	X	X	X	All
2	SW-A22 (0.0-0.5)		2/27/19	1245	CC	SO	1					1				X	X	X	X	X	X	X	G18
3	SW-A22(2.0-2.5)		2/27/19	1255	CC	SO	1					1				X	X	X	X	X	X	X	
4	SW-A23(0.0-0.5)		2/27/19	1305	CC	SO	1					1				X	X	X	X	X	X	X	D16
5	SW A23(2.0-2.5)		2/27/19	1315	CC	SO	1					1				X	X	X	X	X	X	X	
6	107-MW24N-1		2/27/19	1325	CC	SO	1					1				X	X	X	X	X	X	X	
7	107-MW34N		2/27/19	1335	CC	SO	1					1				X	X	X	X	X	X	X	

Turnaround Time (Business days)

Approved by (SGS Project Manager)/Date:

- [ ] Std. 10 Business Days
- [ ] 5 Day RUSH
- [ ] 3 Day RUSH
- [ ] 2 Day RUSH
- [ ] 1 Day RUSH
- [ ] other

Emergency & Rush T/A data available via LabLink

Data Deliverable Information

- [ ] Commercial "A" (Level 1)
- [ ] Commercial "B" (Level 2)
- [ ] FULLT1 (Level 3+4)
- [ ] NJ Reduced
- [ ] Commercial "C"
- [ ] NJ Data of Known Quality Protocol Reporting
- [ ] NYASP Category A
- [ ] NYASP Category B
- [ ] State Forms
- [ ] EDD Format
- [ ] Other

Commercial "A" = Results Only; Commercial "B" = Results + QC Summary
NJ Reduced = Results + QC Summary + Partial Raw data

Comments / Special Instructions

INITIAL ASSESSMENT 3A (M)
LABEL VERIFICATION

Sample inventory is verified upon receipt in the Laboratory

Sample Custody must be documented below each time samples change possession, including courier delivery.

Relinquished by Sampler: 1	Date Time: 02/27/19 1357	Received By: 1	Relinquished By: 2	Date Time: 1820	Received By: 2
Relinquished by Sampler: 3	Date Time:	Received By: 3	Relinquished By: 4	Date Time:	Received By: 4
Relinquished by: 5	Date Time:	Received By: 5	Custody Seal # 18364	Intact / Not intact	Preserved where applicable / On Ice / Cooler Temp: 3.4

Form:SM088-03C (revised 2/12/18)

http://www.sgs.com/en/terms-and-conditions

5.2 5

Report of Analysis

Client Sample ID:	FB(20190227)-A		
Lab Sample ID:	JC83511-1	**Date Sampled:**	02/27/19
Matrix:	AQ - Field Blank Soil	**Date Received:**	02/27/19
		Percent Solids:	n/a
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	< 0.010	0.010	mg/l	1	02/27/19 22:28	JO	SW846 7196A
Redox Potential Vs H2	461		mv	1	02/28/19 09:25	RI	ASTM D1498-76
pH [a]	4.48		su	1	02/27/19 19:05	JK	SM4500H+ B-11

(a) Sample received out of holding time for pH analysis.

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A22(0.0-0.5)		
Lab Sample ID:	JC83511-2	**Date Sampled:**	02/27/19
Matrix:	SO - Soil	**Date Received:**	02/27/19
		Percent Solids:	70.9
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	19.1 J	0.56	mg/kg	1	03/05/19 12:34	RI	SW846 3060A/7196A
Redox Potential Vs H2	488		mv	1	02/28/19 16:17	RI	ASTM D1498-76M
Solids, Percent	70.9		%	1	03/01/19 09:23	RC	SM2540 G 18TH ED MOD
pH	7.88		su	1	02/28/19 15:50	RI	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A22(2.0-2.5)		
Lab Sample ID:	JC83511-3	**Date Sampled:**	02/27/19
Matrix:	SO - Soil	**Date Received:**	02/27/19
		Percent Solids:	67.5
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	45.4 J	0.59	mg/kg	1	03/05/19 12:34	RI	SW846 3060A/7196A
Redox Potential Vs H2	460		mv	1	02/28/19 16:31	RI	ASTM D1498-76M
Solids, Percent	67.5		%	1	03/01/19 09:23	RC	SM2540 G 18TH ED MOD
pH	8.04		su	1	02/28/19 15:55	RI	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A23(0.0-0.5)		
Lab Sample ID:	JC83511-4	**Date Sampled:**	02/27/19
Matrix:	SO - Soil	**Date Received:**	02/27/19
		Percent Solids:	82.7
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	17.4 J	0.48	mg/kg	1	03/05/19 12:29	RI	SW846 3060A/7196A
Redox Potential Vs H2	449		mv	1	02/28/19 16:36	RI	ASTM D1498-76M
Solids, Percent	82.7		%	1	03/01/19 09:23	RC	SM2540 G 18TH ED MOD
pH	7.44		su	1	02/28/19 15:58	RI	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A23(2.0-2.5)		
Lab Sample ID:	JC83511-5	**Date Sampled:**	02/27/19
Matrix:	SO - Soil	**Date Received:**	02/27/19
		Percent Solids:	77.0
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	46.1 J	0.52	mg/kg	1	03/05/19 12:34	RI	SW846 3060A/7196A
Redox Potential Vs H2	369		mv	1	02/28/19 16:44	RI	ASTM D1498-76M
Solids, Percent	77		%	1	03/01/19 09:23	RC	SM2540 G 18TH ED MOD
pH	9.05		su	1	02/28/19 16:02	RI	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID: 107_M024N_1
Lab Sample ID: JC83511-6
Matrix: SO - Soil
Project: PPG Site 107, 18 Chapel Avenue, Jersey City, NJ

Date Sampled: 02/27/19
Date Received: 02/27/19
Percent Solids: 77.5

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	47.7 J	1.0	mg/kg	2	03/05/19 12:34	RI	SW846 3060A/7196A
Redox Potential Vs H2	443		mv	1	02/28/19 16:50	RI	ASTM D1498-76M
Solids, Percent	77.5		%	1	03/01/19 09:23	RC	SM2540 G 18TH ED MOD
pH	7.73		su	1	02/28/19 16:05	RI	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID:	107_M034N		
Lab Sample ID:	JC83511-7	**Date Sampled:**	02/27/19
Matrix:	SO - Soil	**Date Received:**	02/27/19
		Percent Solids:	86.5
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	< 0.46 UJ	0.46	mg/kg	1	03/05/19 12:34	RI	SW846 3060A/7196A
Redox Potential Vs H2	445		mv	1	02/28/19 16:53	RI	ASTM D1498-76M
Solids, Percent	86.5		%	1	03/01/19 09:23	RC	SM2540 G 18TH ED MOD
pH	7.81		su	1	02/28/19 16:08	RI	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A22(0.0-0.5)		
Lab Sample ID:	JC83511-2R	**Date Sampled:**	02/27/19
Matrix:	SO - Soil	**Date Received:**	02/27/19
		Percent Solids:	70.9
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	20.3	0.56	mg/kg	1	03/18/19 13:51	RI	SW846 3060A/7196A

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A22(2.0-2.5)		
Lab Sample ID:	JC83511-3R	**Date Sampled:**	02/27/19
Matrix:	SO - Soil	**Date Received:**	02/27/19
		Percent Solids:	67.5
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	63.8	1.2	mg/kg	2	03/18/19 13:51	RI	SW846 3060A/7196A

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A23(0.0-0.5)		
Lab Sample ID:	JC83511-4R	**Date Sampled:**	02/27/19
Matrix:	SO - Soil	**Date Received:**	02/27/19
		Percent Solids:	82.7
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	11.2	0.48	mg/kg	1	03/18/19 13:47	RI	SW846 3060A/7196A

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A23(0.0-0.5)		
Lab Sample ID:	JC83511-4RT	**Date Sampled:**	02/27/19
Matrix:	SO - Soil	**Date Received:**	02/27/19
		Percent Solids:	82.7
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Iron, Ferrous [a]	0.99 J	0.20	%	1	03/23/19 09:30	MP	ASTM D3872-86
~~Sulfide Screen [b]~~	~~NEGATIVE~~			~~1~~	~~03/23/19 11:00~~	~~MP~~	~~SM4500S2- A-11~~ R
Total Organic Carbon [c]	169000 J	120	mg/kg	1	03/22/19 20:49	CD	LLOYD KAHN 1988 MOD

(a) The ferrous iron test was analyzed after completion of Cr6 testing (outside of normal hold times for this parameter) in order to provide more information about the possible impact of the sample matrix on Cr6 recoveries.
(b) The sulfide screen test was analyzed after completion of Cr6 testing (outside of normal hold times for this parameter) in order to provide more information about the possible impact of the sample matrix on Cr6 recoveries.
(c) Analysis done out of holding time.

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A23(2.0-2.5)		
Lab Sample ID:	JC83511-5R	**Date Sampled:**	02/27/19
Matrix:	SO - Soil	**Date Received:**	02/27/19
		Percent Solids:	77.0
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	19.3	0.52	mg/kg	1	03/18/19 13:51	RI	SW846 3060A/7196A

RL = Reporting Limit

Report of Analysis

Client Sample ID:	107_M024N_1		
Lab Sample ID:	JC83511-6R	**Date Sampled:**	02/27/19
Matrix:	SO - Soil	**Date Received:**	02/27/19
		Percent Solids:	77.5
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	20.3	0.52	mg/kg	1	03/18/19 13:51	RI	SW846 3060A/7196A

RL = Reporting Limit

Report of Analysis

Client Sample ID:	107_M034N		
Lab Sample ID:	JC83511-7R	**Date Sampled:**	02/27/19
Matrix:	SO - Soil	**Date Received:**	02/27/19
		Percent Solids:	86.5
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	< 0.46	0.46	mg/kg	1	03/18/19 13:51	RI	SW846 3060A/7196A

RL = Reporting Limit

Report of Analysis

Client Sample ID: FB(20190227)-A
Lab Sample ID: JC83511-1A
Matrix: AQ - Field Blank Soil
Project: PPG Site 107, 18 Chapel Avenue, Jersey City, NJ

Date Sampled: 02/27/19
Date Received: 02/27/19
Percent Solids: n/a

Total Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 6.0	6.0	ug/l	1	02/28/19	02/28/19	ND	SW846 6010D [1]	SW846 3010A [2]
Chromium	< 10	10	ug/l	1	02/28/19	02/28/19	ND	SW846 6010D [1]	SW846 3010A [2]
Nickel	< 10	10	ug/l	1	02/28/19	02/28/19	ND	SW846 6010D [1]	SW846 3010A [2]
Thallium	< 10	10	ug/l	1	02/28/19	02/28/19	ND	SW846 6010D [1]	SW846 3010A [2]
Vanadium	< 50	50	ug/l	1	02/28/19	02/28/19	ND	SW846 6010D [1]	SW846 3010A [2]

(1) Instrument QC Batch: MA46229
(2) Prep QC Batch: MP12775

RL = Reporting Limit

Report of Analysis

Client Sample ID:	FB(20190227)-A		
Lab Sample ID:	JC83511-1A	**Date Sampled:**	02/27/19
Matrix:	AQ - Field Blank Soil	**Date Received:**	02/27/19
		Percent Solids:	n/a
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	< 0.020	0.020	mg/l	1	02/28/19 17:47	ND	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A22(0.0-0.5)		
Lab Sample ID:	JC83511-2A	**Date Sampled:**	02/27/19
Matrix:	SO - Soil	**Date Received:**	02/27/19
		Percent Solids:	70.9
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 2.7	2.7	mg/kg	1	02/27/19	02/28/19	ND	SW846 6010D [1]	SW846 3050B [3]
Chromium	925	1.4	mg/kg	1	02/27/19	02/28/19	ND	SW846 6010D [1]	SW846 3050B [3]
Nickel	193	5.5	mg/kg	1	02/27/19	02/28/19	ND	SW846 6010D [1]	SW846 3050B [3]
Thallium [a]	< 4.1	4.1	mg/kg	3	02/27/19	02/28/19	ND	SW846 6010D [2]	SW846 3050B [3]
Vanadium	295	6.8	mg/kg	1	02/27/19	02/28/19	ND	SW846 6010D [1]	SW846 3050B [3]

(1) Instrument QC Batch: MA46226
(2) Instrument QC Batch: MA46229
(3) Prep QC Batch: MP12752

(a) Elevated detection limit due to dilution required for high interfering element.

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A22(0.0-0.5)		
Lab Sample ID:	JC83511-2A	**Date Sampled:**	02/27/19
Matrix:	SO - Soil	**Date Received:**	02/27/19
		Percent Solids:	70.9
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	906	2.0	mg/kg	1	03/05/19 12:34	RI	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID: SW-A22(2.0-2.5)
Lab Sample ID: JC83511-3A
Matrix: SO - Soil
Project: PPG Site 107, 18 Chapel Avenue, Jersey City, NJ

Date Sampled: 02/27/19
Date Received: 02/27/19
Percent Solids: 67.5

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony [a]	< 15	15	mg/kg	5	02/27/19	02/28/19	ND	SW846 6010D [2]	SW846 3050B [3]
Chromium	2420	7.3	mg/kg	5	02/27/19	02/28/19	ND	SW846 6010D [2]	SW846 3050B [3]
Nickel	384	5.9	mg/kg	1	02/27/19	02/28/19	ND	SW846 6010D [1]	SW846 3050B [3]
Thallium [a]	< 7.3	7.3	mg/kg	5	02/27/19	02/28/19	ND	SW846 6010D [2]	SW846 3050B [3]
Vanadium [a]	554	37	mg/kg	5	02/27/19	02/28/19	ND	SW846 6010D [2]	SW846 3050B [3]

(1) Instrument QC Batch: MA46226
(2) Instrument QC Batch: MA46229
(3) Prep QC Batch: MP12752

(a) Elevated detection limit due to dilution required for high interfering element.

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A22(2.0-2.5)		
Lab Sample ID:	JC83511-3A	**Date Sampled:**	02/27/19
Matrix:	SO - Soil	**Date Received:**	02/27/19
		Percent Solids:	67.5
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	2370	7.9	mg/kg	1	03/05/19 12:34	RI	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A23(0.0-0.5)		
Lab Sample ID:	JC83511-4A	**Date Sampled:**	02/27/19
Matrix:	SO - Soil	**Date Received:**	02/27/19
		Percent Solids:	82.7
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 2.3	2.3	mg/kg	1	02/27/19	02/28/19	ND	SW846 6010D [1]	SW846 3050B [2]
Chromium	214	1.2	mg/kg	1	02/27/19	02/28/19	ND	SW846 6010D [1]	SW846 3050B [2]
Nickel	34.7	4.6	mg/kg	1	02/27/19	02/28/19	ND	SW846 6010D [1]	SW846 3050B [2]
Thallium	< 1.2	1.2	mg/kg	1	02/27/19	02/28/19	ND	SW846 6010D [1]	SW846 3050B [2]
Vanadium	44.9	5.8	mg/kg	1	02/27/19	02/28/19	ND	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA46226
(2) Prep QC Batch: MP12752

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A23(0.0-0.5)		
Lab Sample ID:	JC83511-4A	**Date Sampled:**	02/27/19
Matrix:	SO - Soil	**Date Received:**	02/27/19
		Percent Solids:	82.7
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	197	1.7	mg/kg	1	03/05/19 12:29	RI	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A23(2.0-2.5)		
Lab Sample ID:	JC83511-5A	**Date Sampled:**	02/27/19
Matrix:	SO - Soil	**Date Received:**	02/27/19
		Percent Solids:	77.0
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 2.7	2.7	mg/kg	1	02/27/19	02/28/19	ND	SW846 6010D [1]	SW846 3050B [2]
Chromium	687	1.4	mg/kg	1	02/27/19	02/28/19	ND	SW846 6010D [1]	SW846 3050B [2]
Nickel	74.0	5.5	mg/kg	1	02/27/19	02/28/19	ND	SW846 6010D [1]	SW846 3050B [2]
Thallium	< 1.4	1.4	mg/kg	1	02/27/19	02/28/19	ND	SW846 6010D [1]	SW846 3050B [2]
Vanadium	117	6.8	mg/kg	1	02/27/19	02/28/19	ND	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA46226
(2) Prep QC Batch: MP12752

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A23(2.0-2.5)		
Lab Sample ID:	JC83511-5A	**Date Sampled:**	02/27/19
Matrix:	SO - Soil	**Date Received:**	02/27/19
		Percent Solids:	77.0
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	641	1.9	mg/kg	1	03/05/19 12:34	RI	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID: 107_M024N_1
Lab Sample ID: JC83511-6A
Matrix: SO - Soil
Project: PPG Site 107, 18 Chapel Avenue, Jersey City, NJ

Date Sampled: 02/27/19
Date Received: 02/27/19
Percent Solids: 77.5

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 2.5	2.5	mg/kg	1	02/27/19	02/28/19	ND	SW846 6010D [1]	SW846 3050B [3]
Chromium	564	1.2	mg/kg	1	02/27/19	02/28/19	ND	SW846 6010D [1]	SW846 3050B [3]
Nickel	56.9	5.0	mg/kg	1	02/27/19	02/28/19	ND	SW846 6010D [1]	SW846 3050B [3]
Thallium [a]	< 2.5	2.5	mg/kg	2	02/27/19	02/28/19	ND	SW846 6010D [2]	SW846 3050B [3]
Vanadium	94.3	6.2	mg/kg	1	02/27/19	02/28/19	ND	SW846 6010D [1]	SW846 3050B [3]

(1) Instrument QC Batch: MA46226
(2) Instrument QC Batch: MA46229
(3) Prep QC Batch: MP12752

(a) Elevated detection limit due to dilution required for high interfering element.

RL = Reporting Limit

Report of Analysis

Client Sample ID:	107_M024N_1		
Lab Sample ID:	JC83511-6A	**Date Sampled:**	02/27/19
Matrix:	SO - Soil	**Date Received:**	02/27/19
		Percent Solids:	77.5
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	516	2.2	mg/kg	1	03/05/19 12:34	RI	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID: 107_M034N
Lab Sample ID: JC83511-7A
Matrix: SO - Soil
Project: PPG Site 107, 18 Chapel Avenue, Jersey City, NJ

Date Sampled: 02/27/19
Date Received: 02/27/19
Percent Solids: 86.5

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 2.4	2.4	mg/kg	1	02/27/19	02/28/19	ND	SW846 6010D [1]	SW846 3050B [2]
Chromium	15.2	1.2	mg/kg	1	02/27/19	02/28/19	ND	SW846 6010D [1]	SW846 3050B [2]
Nickel	13.5	4.7	mg/kg	1	02/27/19	02/28/19	ND	SW846 6010D [1]	SW846 3050B [2]
Thallium	< 1.2	1.2	mg/kg	1	02/27/19	02/28/19	ND	SW846 6010D [1]	SW846 3050B [2]
Vanadium	22.3	5.9	mg/kg	1	02/27/19	02/28/19	ND	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA46226
(2) Prep QC Batch: MP12752

RL = Reporting Limit

Report of Analysis

Client Sample ID:	107_M034N		
Lab Sample ID:	JC83511-7A	**Date Sampled:**	02/27/19
Matrix:	SO - Soil	**Date Received:**	02/27/19
		Percent Solids:	86.5
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	15.2	1.7	mg/kg	1	03/05/19 12:34	RI	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

SO FB

CHAIN OF CUSTODY

SGS North America Inc. - Dayton
2235 Route 130, Dayton, NJ 08810
TEL. 732-329-0200 FAX: 732-329-3499/3480
www.sgs.com/ehsusa

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E

FED-EX Tracking # | Bottle Order Control #
SGS Quote # | SGS Job # JC83512

Client / Reporting Information

Company Name: Arcadis
Street Address: 10 Friends Lane, Suite 200
City: Newtown, State: PA, Zip: 18440
Project Contact: Matthew Ball, E-mail:
Phone #: 610.755.7080
Sampler(s) Name(s): C Buchanan, Phone #:

Project Information

Project Name: PPG Site 107 (Jersey City)
Street: 18 Chapel Avenue
City: Jersey City, State: NJ
Project #: NP000770.0003
Client Purchase Order #:
Project Manager: Jim Mclaughlin, Jr.

Billing Information (if different from Report to)
Company Name:
Street Address:
City: State: Zip:
Attention:

Requested Analysis

Matrix Codes: DW - Drinking Water; GW - Ground Water; WW - Water; SW - Surface Water; SO - Soil; SL - Sludge; SED-Sediment; OI - Oil; LIQ - Other Liquid; AIR - Air; SOL - Other Solid; WP - Wipe; FB - Field Blank; EB-Equipment Blank; RB - Rinse Blank; TB - Trip Blank

SGS Sample #	Field ID / Point of Collection	MEOH/DI Vial #	Collection Date	Collection Time	Sampled by	Grab (G) Comp (C)	Matrix	# of bottles	Number of preserved Bottles: HCl	NaOH	HNO3	H2SO4	NONE	DI Water	MEOH	ENCORE	Total Chromium	Hexavalent Chromium	Trivalent Chromium	Antimony	Nickel	Thallium	Vanadium	LAB USE ONLY
1	FB(20190227)		2/27/19	1240	CB	G	FB	2			1		1				Y	Y	Y	Y	Y	Y	Y	
2	107-K32		2/27/19	1330	CB	G	SO	1					1				Y	Y	Y	Y	Y	Y	Y	All
3	BS-C175		2/27/19	1340	CB	G	SO	1					1				Y	Y	Y	Y	Y	Y	Y	G18
																								D16

Turn Around Time (Business Days)

Approved By (SGS PM): / Date:

- [ ] 10 Business Days
- [ ] 5 Business Days
- [ ] 3 Business Days*
- [x] 2 Business Days*
- [ ] 1 Business Day*
- [ ] Other
All data available via Lablink
Approval needed for 1-3 Business Day TAT

Deliverable

- [ ] Commercial "A" (Level 1)
- [ ] Commercial "B" (Level 2)
- [ ] NJ Reduced (Level 3)
- [ ] Full Tier I (Level 4)
- [ ] Commercial "C"
- [ ] NJ DKQP
- [ ] NYASP Category A
- [ ] NYASP Category B
- [ ] MA MCP Criteria
- [ ] CT RCP Criteria
- [ ] State Forms
- [x] EDD Format _Equis_
- [ ] DOD-QSM5

Commercial "A" = Results only; Commercial "B" = Results + QC Summary
Commercial "C" = Results + QC Summary + Partial Raw data

Comments / Special Instructions

INITIAL ASESSMENT 3A (M)
LABEL VERIFICATION
http://www.sgs.com/en/terms-and-conditions

Sample Custody must be documented below each time samples change possession, including courier delivery.

	Relinquished by:	Date / Time:	Received By:	Relinquished By:	Date / Time:	Received By:
1		2/27/19 1430	1	2	2/27/19 1830	2
2		2/27/19 1430	2	3		3
3			3	4		4
4			4	5		5
5			5			

Custody Seal # 23210 (Intact / Not Intact) | Preserved where applicable (Absent / Therm. ID:) | On Ice: X | Cooler Temp. °C: C1P 3.4

SGS Post Ex Sample COCs Template 20190109

5.2 5

Report of Analysis

Client Sample ID:	FB(20190227)		
Lab Sample ID:	JC83512-1	**Date Sampled:**	02/27/19
Matrix:	AQ - Field Blank Soil	**Date Received:**	02/27/19
		Percent Solids:	n/a
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	< 0.010	0.010	mg/l	1	02/27/19 22:32	JO	SW846 7196A
Redox Potential Vs H2	473		mv	1	02/28/19 09:28	RI	ASTM D1498-76
pH [a]	4.46		su	1	02/27/19 19:10	JK	SM4500H+ B-11

(a) Sample received out of holding time for pH analysis.

RL = Reporting Limit

Report of Analysis

Client Sample ID: 107_K032
Lab Sample ID: JC83512-2
Matrix: SO - Soil
Project: PPG Site 107, 18 Chapel Avenue, Jersey City, NJ

Date Sampled: 02/27/19
Date Received: 02/27/19
Percent Solids: 68.1

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	< 0.59 UJ-	0.59	mg/kg	1	03/06/19 17:58	NV	SW846 3060A/7196A
Redox Potential Vs H2	185		mv	1	02/28/19 17:11	RI	ASTM D1498-76M
Solids, Percent	68.1		%	1	03/01/19 09:23	RC	SM2540 G 18TH ED MOD
pH	6.89		su	1	02/28/19 16:13	RI	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-C17S		
Lab Sample ID:	JC83512-3	**Date Sampled:**	02/27/19
Matrix:	SO - Soil	**Date Received:**	02/27/19
		Percent Solids:	73.8
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	76.5 J-	2.7	mg/kg	5	03/06/19 17:58	NV	SW846 3060A/7196A
Redox Potential Vs H2	319		mv	1	02/28/19 17:16	RI	ASTM D1498-76M
Solids, Percent	73.8		%	1	03/01/19 09:23	RC	SM2540 G 18TH ED MOD
pH	7.45		su	1	02/28/19 16:17	RI	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID:	107_K032		
Lab Sample ID:	JC83512-2R	**Date Sampled:**	02/27/19
Matrix:	SO - Soil	**Date Received:**	02/27/19
		Percent Solids:	68.1
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	< 0.59	0.59	mg/kg	1	03/19/19 16:32	RI	SW846 3060A/7196A

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-C17S		
Lab Sample ID:	JC83512-3R	**Date Sampled:**	02/27/19
Matrix:	SO - Soil	**Date Received:**	02/27/19
		Percent Solids:	73.8
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	45.9	1.1	mg/kg	2	03/19/19 16:32	RI	SW846 3060A/7196A

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-C17S		
Lab Sample ID:	JC83512-3RT	**Date Sampled:**	02/27/19
Matrix:	SO - Soil	**Date Received:**	02/27/19
		Percent Solids:	73.8
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Iron, Ferrous [a]	0.22 J	0.20	%	1	03/29/19 11:30	MP	ASTM D3872-86
~~Sulfide Screen [b]~~	~~NEGATIVE~~			~~1~~	~~03/29/19 11:30~~	~~MP~~	~~SM4500S2- A-11~~ R
Total Organic Carbon [c]	89500 J	140	mg/kg	1	03/22/19 17:17	CD	LLOYD KAHN 1988 MOD

(a) The ferrous iron test was analyzed after completion of Cr6 testing (outside of normal hold times for this parameter) in order to provide more information about the possible impact of the sample matrix on Cr6 recoveries.
(b) The sulfide screen test was analyzed after completion of Cr6 testing (outside of normal hold times for this parameter) in order to provide more information about the possible impact of the sample matrix on Cr6 recoveries.
(c) Analysis done out of holding time.

RL = Reporting Limit

Report of Analysis

Client Sample ID: FB(20190227)
Lab Sample ID: JC83512-1A
Matrix: AQ - Field Blank Soil
Project: PPG Site 107, 18 Chapel Avenue, Jersey City, NJ

Date Sampled: 02/27/19
Date Received: 02/27/19
Percent Solids: n/a

Total Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 6.0	6.0	ug/l	1	02/28/19	02/28/19	ND	SW846 6010D [1]	SW846 3010A [2]
Chromium	< 10	10	ug/l	1	02/28/19	02/28/19	ND	SW846 6010D [1]	SW846 3010A [2]
Nickel	< 10	10	ug/l	1	02/28/19	02/28/19	ND	SW846 6010D [1]	SW846 3010A [2]
Thallium	< 10	10	ug/l	1	02/28/19	02/28/19	ND	SW846 6010D [1]	SW846 3010A [2]
Vanadium	< 50	50	ug/l	1	02/28/19	02/28/19	ND	SW846 6010D [1]	SW846 3010A [2]

(1) Instrument QC Batch: MA46229
(2) Prep QC Batch: MP12775

RL = Reporting Limit

Report of Analysis

Client Sample ID:	FB(20190227)		
Lab Sample ID:	JC83512-1A	**Date Sampled:**	02/27/19
Matrix:	AQ - Field Blank Soil	**Date Received:**	02/27/19
		Percent Solids:	n/a
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	< 0.020	0.020	mg/l	1	02/28/19 17:53	ND	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	107-K32		
Lab Sample ID:	JC83512-2A	**Date Sampled:**	02/27/19
Matrix:	SO - Soil	**Date Received:**	02/27/19
		Percent Solids:	68.1
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 3.1	3.1	mg/kg	1	02/27/19	02/28/19	ND	SW846 6010D [1]	SW846 3050B [2]
Chromium	15.9	1.5	mg/kg	1	02/27/19	02/28/19	ND	SW846 6010D [1]	SW846 3050B [2]
Nickel	11.5	6.1	mg/kg	1	02/27/19	02/28/19	ND	SW846 6010D [1]	SW846 3050B [2]
Thallium	< 1.5	1.5	mg/kg	1	02/27/19	02/28/19	ND	SW846 6010D [1]	SW846 3050B [2]
Vanadium	24.1	7.6	mg/kg	1	02/27/19	02/28/19	ND	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA46226
(2) Prep QC Batch: MP12752

RL = Reporting Limit

Report of Analysis

Client Sample ID:	107-K32		
Lab Sample ID:	JC83512-2A	**Date Sampled:**	02/27/19
Matrix:	SO - Soil	**Date Received:**	02/27/19
		Percent Solids:	68.1
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	15.9	2.1	mg/kg	1	03/06/19 17:58	NV	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID: BS-C17S
Lab Sample ID: JC83512-3A
Matrix: SO - Soil
Project: PPG Site 107, 18 Chapel Avenue, Jersey City, NJ

Date Sampled: 02/27/19
Date Received: 02/27/19
Percent Solids: 73.8

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony [a]	< 5.2	5.2	mg/kg	2	02/27/19	02/28/19	ND	SW846 6010D [2]	SW846 3050B [3]
Chromium	1320	2.6	mg/kg	2	02/27/19	02/28/19	ND	SW846 6010D [2]	SW846 3050B [3]
Nickel	20.0	5.2	mg/kg	1	02/27/19	02/28/19	ND	SW846 6010D [1]	SW846 3050B [3]
Thallium	< 1.3	1.3	mg/kg	1	02/27/19	02/28/19	ND	SW846 6010D [1]	SW846 3050B [3]
Vanadium [a]	24.1	13	mg/kg	2	02/27/19	02/28/19	ND	SW846 6010D [2]	SW846 3050B [3]

(1) Instrument QC Batch: MA46226
(2) Instrument QC Batch: MA46229
(3) Prep QC Batch: MP12752

(a) Elevated detection limit due to dilution required for high interfering element.

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-C17S		
Lab Sample ID:	JC83512-3A	**Date Sampled:**	02/27/19
Matrix:	SO - Soil	**Date Received:**	02/27/19
		Percent Solids:	73.8
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	1240	5.3	mg/kg	1	03/06/19 17:58	NV	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

CHAIN OF CUSTODY

SGS North America Inc. - Dayton
2235 Route 130, Dayton, NJ 08810
TEL. 732-329-0200 FAX: 732-329-3499/3480
www.sgs.com/ehsusa

Page 1 OF 1

FED-EX Tracking #:
Bottle Order Control #: AK-011719-169
SGS Quote #:
SGS Job #: JC83593

Client / Reporting Information

Company Name: Arcadis
Street Address: 10 Friends Lane, Suite 200
City / State / Zip: Newtown, PA 18440
Project Contact / E-mail: Matthew Bell
Phone #: 610.755.7080
Sample(s) Name(s) / Phone #: C Buchanan

Project Information

Project Name: PPG Site 107 (Jersey City)
Street: 18 Chapel Avenue
City / State: Jersey City NJ
Project #: NP000770.0001
Client Purchase Order #:
Project Manager: Jim Mclaughlin, Jr.

Billing Information (if different from Report to)
Company Name:
Street Address:
City / State / Zip:
Attention:

Requested Analysis

SGS Sample #	Field ID / Point of Collection	MEOH/DI Vial #	Collection Date	Collection Time	Sampled by	Grab (G) / Comp (C)	Matrix	# of bottles	HCl	NaOH	HNO3	H2SO4	NONE	DI Water	MEOH	ENCORE	Total Chromium	Hexavalent Chromium	Trivalent Chromium	Antimony	Nickel	Thallium	Vanadium	LAB USE ONLY
1	FB(20190228)		2/28/19	12:00	CC	G	FB	2			1		1				X	X	X	X	X	X	X	
2	BS-C17TT		2/28/19	0945	CB	G	SO	1					1				X	X	X	X	X	X	X	A26 C34 D16

Matrix Codes: DW - Drinking Water; GW - Ground Water; WW - Water; SW - Surface Water; SO - Soil; SL - Sludge; SED-Sediment; OI - Oil; LIQ - Other Liquid; AIR - Air; SOL - Other Solid; WP - Wipe; FB - Field Blank; EB-Equipment Blank; RB - Rinse Blank; TB - Trip Blank

Turn Around Time (Business Days)

Approved By (SGS PM): / Date:

- [ ] 10 Business Days
- [ ] 5 Business Days
- [ ] 3 Business Days*
- [x] 2 Business Days*
- [ ] 1 Business Day*
- [ ] Other
All data available via Labink

Approval needed for 1-3 Business Day TAT

Deliverable

- [ ] Commercial "A" (Level 1)
- [ ] Commercial "B" (Level 2)
- [ ] NJ Reduced (Level 3)
- [ ] Full Tier I (Level 4)
- [ ] Commercial "C"
- [ ] NJ DKQP
- [ ] NYASP Category A
- [ ] NYASP Category B
- [ ] MA MCP Criteria
- [ ] CT RCP Criteria
- [ ] State Forms
- [x] EDD Format _Equis_
- [ ] DOD-QSM5

Commercial "A" = Results only; Commercial "B" = Results + QC Summary
Commercial "C" = Results + QC Summary + Partial Raw data

Comments / Special Instructions

Initial Assessment 2B (N)
Label Verification

http://www.sgs.com/en/terms-and-conditions

Sample Custody must be documented below each time samples change possession, including courier delivery.

	Relinquished by	Date / Time	Received By	Custody Seal #	Intact / Not Intact	Preserved where applicable / Absent	On Ice	Cooler Temp. °C
1		2/28/19 1400	1					
2			2					
3			3					
4		2/28/19 1754	4	27234	Intact	Therm. ID:	X	2.0
5			5					

SGS Post Ex Sample COCs Template 20190109

JC83593: Chain of Custody
Page 1 of 4

Report of Analysis

Client Sample ID:	FB(20190228)		
Lab Sample ID:	JC83593-1	**Date Sampled:**	02/28/19
Matrix:	AQ - Field Blank Soil	**Date Received:**	02/28/19
		Percent Solids:	n/a
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	< 0.010	0.010	mg/l	1	02/28/19 22:11	JO	SW846 7196A
Redox Potential Vs H2	430		mv	1	03/03/19 11:20	JOO	ASTM D1498-76
pH [a]	4.47		su	1	02/28/19 19:03	AS	SM4500H+ B-11

(a) Sample received out of holding time for pH analysis.

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-C17TT		
Lab Sample ID:	JC83593-2	**Date Sampled:**	02/28/19
Matrix:	SO - Soil	**Date Received:**	02/28/19
		Percent Solids:	65.4
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	< 0.61 RA	0.61	mg/kg	1	03/06/19 17:40	JOO	SW846 3060A/7196A
Redox Potential Vs H2	214		mv	1	03/03/19 11:13	JOO	ASTM D1498-76M
Solids, Percent	65.4		%	1	03/01/19 09:12	RC	SM2540 G 18TH ED MOD
pH	6.66 J		su	1	03/03/19 11:13	JOO	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-C17TT		
Lab Sample ID:	JC83593-2R	**Date Sampled:**	02/28/19
Matrix:	SO - Soil	**Date Received:**	02/28/19
		Percent Solids:	65.4
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	1.4 RA	0.61	mg/kg	1	03/19/19 15:18	RI	SW846 3060A/7196A

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-C17TT		
Lab Sample ID:	JC83593-2RT	**Date Sampled:**	02/28/19
Matrix:	SO - Soil	**Date Received:**	02/28/19
		Percent Solids:	65.4
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Iron, Ferrous [a]	1.2 J	0.20	%	1	03/29/19 11:30	MP	ASTM D3872-86
~~Sulfide Screen~~ [b]	~~NEGATIVE~~			~~1~~	~~03/29/19 11:30~~	~~MP~~	~~SM4500S2- A-11~~ R
Total Organic Carbon [c]	36200 J	150	mg/kg	1	03/22/19 11:36	CD	LLOYD KAHN 1988 MOD

(a) The ferrous iron test was analyzed after completion of Cr6 testing (outside of normal hold times for this parameter) in order to provide more information about the possible impact of the sample matrix on Cr6 recoveries.
(b) The sulfide screen test was analyzed after completion of Cr6 testing (outside of normal hold times for this parameter) in order to provide more information about the possible impact of the sample matrix on Cr6 recoveries.
(c) Analysis done out of holding time.

RL = Reporting Limit

Report of Analysis

Client Sample ID: FB(20190228)
Lab Sample ID: JC83593-1A
Matrix: AQ - Field Blank Soil
Project: PPG Site 107, 18 Chapel Avenue, Jersey City, NJ

Date Sampled: 02/28/19
Date Received: 02/28/19
Percent Solids: n/a

Total Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 6.0	6.0	ug/l	1	03/01/19	03/01/19	ND	SW846 6010D [1]	SW846 3010A [2]
Chromium	< 10	10	ug/l	1	03/01/19	03/01/19	ND	SW846 6010D [1]	SW846 3010A [2]
Nickel	< 10	10	ug/l	1	03/01/19	03/01/19	ND	SW846 6010D [1]	SW846 3010A [2]
Thallium	< 10	10	ug/l	1	03/01/19	03/01/19	ND	SW846 6010D [1]	SW846 3010A [2]
Vanadium	< 50	50	ug/l	1	03/01/19	03/01/19	ND	SW846 6010D [1]	SW846 3010A [2]

(1) Instrument QC Batch: MA46234
(2) Prep QC Batch: MP12803

RL = Reporting Limit

Report of Analysis

Client Sample ID:	FB(20190228)		
Lab Sample ID:	JC83593-1A	**Date Sampled:**	02/28/19
Matrix:	AQ - Field Blank Soil	**Date Received:**	02/28/19
		Percent Solids:	n/a
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	< 0.020	0.020	mg/l	1	03/01/19 16:34	ND	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-C17TT		
Lab Sample ID:	JC83593-2A	**Date Sampled:**	02/28/19
Matrix:	SO - Soil	**Date Received:**	02/28/19
		Percent Solids:	65.4
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 3.0	3.0	mg/kg	1	02/28/19	03/01/19	ND	SW846 6010D [1]	SW846 3050B [2]
Chromium	34.5	1.5	mg/kg	1	02/28/19	03/01/19	ND	SW846 6010D [1]	SW846 3050B [2]
Nickel	20.4	5.9	mg/kg	1	02/28/19	03/01/19	ND	SW846 6010D [1]	SW846 3050B [2]
Thallium	< 1.5	1.5	mg/kg	1	02/28/19	03/01/19	ND	SW846 6010D [1]	SW846 3050B [2]
Vanadium	35.6	7.4	mg/kg	1	02/28/19	03/01/19	ND	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA46234
(2) Prep QC Batch: MP12752

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-C17TT		
Lab Sample ID:	JC83593-2A	**Date Sampled:**	02/28/19
Matrix:	SO - Soil	**Date Received:**	02/28/19
		Percent Solids:	65.4
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	34.5	2.1	mg/kg	1	03/06/19 17:40	JOO	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

SO
FB

E

SGS

CHAIN OF CUSTODY

SGS North America Inc. - Dayton
2235 Route 130, Dayton, NJ 08810
TEL. 732-329-0200 FAX: 732-329-3499/3480
www.sgs.com/ehsusa

Page 1 OF 1

FED-EX Tracking #	Bottle Order Control #
SGS Quote #	SGS Job # JC83681

Client / Reporting Information

Company Name: Arcadis
Street Address: 10 Friends Lane, Suite 200
City: Newtown, State: PA, Zip: 18440
Project Contact: Matthew Bell, E-mail:
Phone #: 610.755.7080
Sampler(s) Name(s): C Buchanan, Phone #:

Project Information

Project Name: PPG Site 107 (Jersey City)
Street: 18 Chapel Avenue
City: Jersey City, State: NJ
Project #: NP000770.0001
Client Purchase Order #:
Project Manager: Jim Mclaughlin, Jr.

Billing Information (if different from Report to)

Company Name:
Street Address:
City: State: Zip:
Attention:

Requested Analysis

Matrix Codes

DW - Drinking Water
GW - Ground Water
WW - Water
SW - Surface Water
SO - Soil
SL - Sludge
SED-Sediment
OI - Oil
LIQ - Other Liquid
AIR - Air
SOL - Other Solid
WP - Wipe
FB - Field Blank
EB-Equipment Blank
RB - Rinse Blank
TB - Trip Blank

SGS Sample #	Field ID / Point of Collection	MEOH/DI Vial #	Collection Date	Collection Time	Sampled by	Grab (G) Comp (C)	Matrix	# of bottles	Number of preserved Bottles: HCl	NaOH	HNO3	H2SO4	NONE	DI Water	MEOH	ENCORE	Total Chromium	Hexavalent Chromium	Trivalent Chromium	Antimony	Nickel	Thallium	Vanadium	LAB USE ONLY
1	FB(20190301)		3/1/19	1340	CB	G	FB	2				1	1				X	X	X	X	X	X	X	
2	BS-B2		3/1/19	1400	CB	G	SO	1					1				X	X	X	X	X	X	X	A11
3	BS-D18		3/1/19	1320	CB	G	SO	1					1				X	X	X	X	X	X	X	G13
4	BS-B17T		3/1/19	1315	CB	G	SO	1					1				X	X	X	X	X	X	X	

Turn Around Time (Business Days)

Approved By (SGS PM): / Date:

- [ ] 10 Business Days
- [ ] 5 Business Days
- [ ] 3 Business Days*
- [x] 2 Business Days*
- [ ] 1 Business Day*
- [ ] Other

All data available via Labiink

Approval needed for 1-3 Business Day TAT

Deliverable

- [ ] Commercial "A" (Level 1)
- [ ] Commercial "B" (Level 2)
- [ ] NJ Reduced (Level 3)
- [ ] Full Tier I (Level 4)
- [ ] Commercial "C"
- [ ] NJ DKQP
- [ ] NYASP Category A
- [ ] NYASP Category B
- [ ] MA MCP Criteria_____
- [ ] CT RCP Criteria_____
- [ ] State Forms
- [x] EDD Format _Equis_
- [ ] DOD-QSM5

Commercial "A" = Results only; Commercial "B" = Results + QC Summary
Commercial "C" = Results + QC Summary + Partial Raw data

Comments / Special Instructions

INITIAL ASESSMENT 3A DM

LABEL VERIFICATION_____

http://www.sgs.com/en/terms-and-conditions

Sample Custody must be documented below each time samples change possession, including courier delivery.

Relinquished by: 1	Date / Time: 3/1/19 1414	Received By: 1 Schn	Relinquished By: 2 Schn	Date / Time: 3/1/19 1800	Received By: 2
Relinquished by: 3	Date / Time:	Received By: 3	Relinquished By: 4	Date / Time:	Received By: 4
Relinquished by: 5	Date / Time:	Received By: 5	Custody Seal # 33200	Intact / Not intact	Preserved where applicable / Absent	On Ice / Therm. ID:	Cooler Temp. °C

3.7

SGS Post Ex Sample COCs Template 20190109

Report of Analysis

Client Sample ID:	FB(20190301)		
Lab Sample ID:	JC83681-1	**Date Sampled:**	03/01/19
Matrix:	AQ - Field Blank Soil	**Date Received:**	03/01/19
		Percent Solids:	n/a
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	< 0.010	0.010	mg/l	1	03/01/19 21:18	JO	SW846 7196A
Redox Potential Vs H2	505		mv	1	03/06/19 17:15	EB	ASTM D1498-76
pH [a]	5.91		su	1	03/01/19 19:00	AS	SM4500H+ B-11

(a) Sample received out of holding time for pH analysis.

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-B2		
Lab Sample ID:	JC83681-2	**Date Sampled:**	03/01/19
Matrix:	SO - Soil	**Date Received:**	03/01/19
		Percent Solids:	88.3
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	8.3 J-	0.45	mg/kg	1	03/08/19 16:56	RI	SW846 3060A/7196A
Redox Potential Vs H2	310		mv	1	03/07/19 00:01	EB	ASTM D1498-76M
Solids, Percent	88.3		%	1	03/04/19 09:36	RC	SM2540 G 18TH ED MOD
pH	8.09 J		su	1	03/07/19 23:57	EB	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-D18		
Lab Sample ID:	JC83681-3	**Date Sampled:**	03/01/19
Matrix:	SO - Soil	**Date Received:**	03/01/19
		Percent Solids:	59.7
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	< 0.67 UJ-	0.67	mg/kg	1	03/08/19 16:58	RI	SW846 3060A/7196A
Redox Potential Vs H2	451		mv	1	03/07/19 00:04	EB	ASTM D1498-76M
Solids, Percent	59.7		%	1	03/04/19 09:36	RC	SM2540 G 18TH ED MOD
pH	6.88 J		su	1	03/07/19 00:02	EB	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-D17T		
Lab Sample ID:	JC83681-4	**Date Sampled:**	03/01/19
Matrix:	SO - Soil	**Date Received:**	03/01/19
		Percent Solids:	71.9
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	23.0 J-	0.56	mg/kg	1	03/08/19 16:58	RI	SW846 3060A/7196A
Redox Potential Vs H2	305		mv	1	03/07/19 00:11	EB	ASTM D1498-76M
Solids, Percent	71.9		%	1	03/04/19 09:36	RC	SM2540 G 18TH ED MOD
pH	6.49 J		su	1	03/07/19 00:11	EB	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-B2		
Lab Sample ID:	JC83681-2R	**Date Sampled:**	03/01/19
Matrix:	SO - Soil	**Date Received:**	03/01/19
		Percent Solids:	88.3
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	10.2	0.45	mg/kg	1	03/22/19 11:50	RI	SW846 3060A/7196A

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-D18		
Lab Sample ID:	JC83681-3R	**Date Sampled:**	03/01/19
Matrix:	SO - Soil	**Date Received:**	03/01/19
		Percent Solids:	59.7
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	< 0.67	0.67	mg/kg	1	03/22/19 11:51	RI	SW846 3060A/7196A

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-D17T		
Lab Sample ID:	JC83681-4R	**Date Sampled:**	03/01/19
Matrix:	SO - Soil	**Date Received:**	03/01/19
		Percent Solids:	71.9
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	< 0.56	0.56	mg/kg	1	03/22/19 11:51	RI	SW846 3060A/7196A

RL = Reporting Limit

Report of Analysis

Client Sample ID: FB(20190301)
Lab Sample ID: JC83681-1A
Matrix: AQ - Field Blank Soil
Project: PPG Site 107, 18 Chapel Avenue, Jersey City, NJ

Date Sampled: 03/01/19
Date Received: 03/01/19
Percent Solids: n/a

Total Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 6.0	6.0	ug/l	1	03/02/19	03/04/19	ND	SW846 6010D [1]	SW846 3010A [2]
Chromium	< 10	10	ug/l	1	03/02/19	03/04/19	ND	SW846 6010D [1]	SW846 3010A [2]
Nickel	< 10	10	ug/l	1	03/02/19	03/04/19	ND	SW846 6010D [1]	SW846 3010A [2]
Thallium	< 10	10	ug/l	1	03/02/19	03/04/19	ND	SW846 6010D [1]	SW846 3010A [2]
Vanadium	< 50	50	ug/l	1	03/02/19	03/04/19	ND	SW846 6010D [1]	SW846 3010A [2]

(1) Instrument QC Batch: MA46240
(2) Prep QC Batch: MP12826

RL = Reporting Limit

Report of Analysis

Client Sample ID:	FB(20190301)		
Lab Sample ID:	JC83681-1A	**Date Sampled:**	03/01/19
Matrix:	AQ - Field Blank Soil	**Date Received:**	03/01/19
		Percent Solids:	n/a
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	< 0.020	0.020	mg/l	1	03/04/19 14:12	ND	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-B2		
Lab Sample ID:	JC83681-2A	**Date Sampled:**	03/01/19
Matrix:	SO - Soil	**Date Received:**	03/01/19
		Percent Solids:	88.3
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 2.2	2.2	mg/kg	1	03/02/19	03/04/19	ND	SW846 6010D [1]	SW846 3050B [2]
Chromium	112	1.1	mg/kg	1	03/02/19	03/04/19	ND	SW846 6010D [1]	SW846 3050B [2]
Nickel	18.1	4.4	mg/kg	1	03/02/19	03/04/19	ND	SW846 6010D [1]	SW846 3050B [2]
Thallium	< 1.1	1.1	mg/kg	1	03/02/19	03/04/19	ND	SW846 6010D [1]	SW846 3050B [2]
Vanadium	37.8	5.6	mg/kg	1	03/02/19	03/04/19	ND	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA46240
(2) Prep QC Batch: MP12752

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-B2		
Lab Sample ID:	JC83681-2A	**Date Sampled:**	03/01/19
Matrix:	SO - Soil	**Date Received:**	03/01/19
		Percent Solids:	88.3
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	104	1.6	mg/kg	1	03/08/19 16:56	RI	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-D18		
Lab Sample ID:	JC83681-3A	**Date Sampled:**	03/01/19
Matrix:	SO - Soil	**Date Received:**	03/01/19
		Percent Solids:	59.7
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 3.4	3.4	mg/kg	1	03/02/19	03/04/19	ND	SW846 6010D [1]	SW846 3050B [2]
Chromium	76.3	1.7	mg/kg	1	03/02/19	03/04/19	ND	SW846 6010D [1]	SW846 3050B [2]
Nickel	21.2	6.7	mg/kg	1	03/02/19	03/04/19	ND	SW846 6010D [1]	SW846 3050B [2]
Thallium	< 1.7	1.7	mg/kg	1	03/02/19	03/04/19	ND	SW846 6010D [1]	SW846 3050B [2]
Vanadium	20.2	8.4	mg/kg	1	03/02/19	03/04/19	ND	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA46240
(2) Prep QC Batch: MP12752

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-D18		
Lab Sample ID:	JC83681-3A	**Date Sampled:**	03/01/19
Matrix:	SO - Soil	**Date Received:**	03/01/19
		Percent Solids:	59.7
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	76.3	2.4	mg/kg	1	03/08/19 16:58	RI	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-D17T		
Lab Sample ID:	JC83681-4A	**Date Sampled:**	03/01/19
Matrix:	SO - Soil	**Date Received:**	03/01/19
		Percent Solids:	71.9
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 2.8	2.8	mg/kg	1	03/02/19	03/04/19	ND	SW846 6010D [1]	SW846 3050B [2]
Chromium	17.8	1.4	mg/kg	1	03/02/19	03/04/19	ND	SW846 6010D [1]	SW846 3050B [2]
Nickel	14.5	5.6	mg/kg	1	03/02/19	03/04/19	ND	SW846 6010D [1]	SW846 3050B [2]
Thallium	< 1.4	1.4	mg/kg	1	03/02/19	03/04/19	ND	SW846 6010D [1]	SW846 3050B [2]
Vanadium	23.4	7.0	mg/kg	1	03/02/19	03/04/19	ND	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA46240
(2) Prep QC Batch: MP12752

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-D17T		
Lab Sample ID:	JC83681-4A	**Date Sampled:**	03/01/19
Matrix:	SO - Soil	**Date Received:**	03/01/19
		Percent Solids:	71.9
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	< 2.0	2.0	mg/kg	1	03/08/19 16:58	RI	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-B2		
Lab Sample ID:	JC83681-2RT	**Date Sampled:**	03/01/19
Matrix:	SO - Soil	**Date Received:**	03/01/19
		Percent Solids:	88.3
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Iron, Ferrous [a]	0.47 J	0.20	%	1	03/29/19 11:30	MP	ASTM D3872-86
~~Sulfide Screen [b]~~	~~NEGATIVE~~			~~1~~	~~03/29/19 11:30~~	~~MP~~	~~SM4500S2- A-11~~ R
Total Organic Carbon [c]	8350 J	110	mg/kg	1	03/29/19 16:55	JO	LLOYD KAHN 1988 MOD

(a) The ferrous iron test was analyzed after completion of Cr6 testing (outside of normal hold times for this parameter) in order to provide more information about the possible impact of the sample matrix on Cr6 recoveries.
(b) The sulfide screen test was analyzed after completion of Cr6 testing (outside of normal hold times for this parameter) in order to provide more information about the possible impact of the sample matrix on Cr6 recoveries.
(c) Analysis done out of holding time.

RL = Reporting Limit

SGS

50 FB

CHAIN OF CUSTODY

SGS North America Inc. - Dayton
2235 Route 130, Dayton, NJ 08810
TEL. 732-329-0200 FAX: 732-329-3499/3480
www.sgs.com/ehsusa

Page 1 OF 1

FED-EX Tracking #: | Bottle Order Control #: AK-011719-171
SGS Quote #: | SGS Job #: JC83762

Client / Reporting Information	Project Information	
Company Name: Arcadis	Project Name: PPG Site 107 (Jersey City)	
Street Address: 10 Friends Lane, Suite 200	Street: 18 Chapel Avenue	Billing Information (if different from Report to)
City: Newtown, State: PA, Zip: 18440	City: Jersey City, State: NJ	Company Name:
Project Contact: Matthew Bell, E-mail:	Project #: NP000770.0001	Street Address:
Phone #: 610.755.7080	Client Purchase Order #:	City: State: Zip:
Sampler(s) Name(s): C Buchanan, Phone #:	Project Manager: Jim Mclaughlin, Jr.	Attention:

Matrix Codes: DW - Drinking Water, GW - Ground Water, WW - Water, SW - Surface Water, SO - Soil, SL - Sludge, SED - Sediment, OI - Oil, LIQ - Other Liquid, AIR - Air, SOL - Other Solid, WP - Wipe, FB - Field Blank, EB - Equipment Blank, RB - Rinse Blank, TB - Trip Blank

SGS Sample #	Field ID / Point of Collection	MEOH/DI Vial #	Collection Date	Collection Time	Sampled by	Grab (G) Comp (C)	Matrix	# of bottles	HCl	NaOH	HNO_3	H_2SO_4	NONE	DI Water	MEOH	ENCORE	Total Chromium	Hexavalent Chromium	Trivalent Chromium	Antimony	Nickel	Thallium	Vanadium	LAB USE ONLY
1	FB(20190304)		3/4/19	1230	DH	G	FB	2			1		1				X	X	X	X	X	X	X	A38
2	BS-E18		3/4/19	1210	DH	G	SO	1					1				X	X	X	X	X	X	X	C18
3	BS-E17		3/4/19	1230	DH	G	SO	1					1				X	X	X	X	X	X	X	D16
4	CS-F18		3/4/19	1315	DH	G	SO	1					1				X	X	X	X	X	X	X	

Turn Around Time (Business Days) — Approved By (SGS PM): / Date:
- [ ] 10 Business Days
- [ ] 5 Business Days
- [ ] 3 Business Days
- [x] 2 Business Days
- [ ] 1 Business Day
- [ ] Other

All data available via Lablink — Approval needed for 1-3 Business Day TAT

Deliverable
- [ ] Commercial "A" (Level 1)
- [ ] Commercial "B" (Level 2)
- [ ] NJ Reduced (Level 3)
- [ ] Full Tier I (Level 4)
- [ ] Commercial "C"
- [ ] NJ DKQP
- [ ] NYASP Category A
- [ ] NYASP Category B
- [ ] MA MCP Criteria
- [ ] CT RCP Criteria
- [ ] State Forms
- [x] EDD Format _Equis_
- [ ] DOD-QSM5

Commercial "A" = Results only; Commercial "B" = Results + QC Summary
Commercial "C" = Results + QC Summary + Partial Raw data

Comments / Special Instructions

http://www.sgs.com/en/terms-and-conditions

Sample Custody must be documented below each time samples change possession, including courier delivery.

Relinquished by:	Date / Time:	Received By:	Relinquished By:	Date / Time:	Received By:
1 [signature]	3/4/19 1320	1 P. Shah	2 P. Shah	3/4/19 15:35	2 [signature]
3		3	4		4
5		5	Custody Seal #: 19300	Intact [x] Not intact [ ]	Preserved where applicable: Absent [ ] Therm. ID: On Ice [x] Cooler Temp. °C: 2.8C IP

INITIAL ASSESSMENT DR 3A

LABEL VERIFICATION ______

SGS Post Ex Sample COCs Template 20190109.xlsx

JC83762: Chain of Custody
Page 1 of 3

Report of Analysis

Client Sample ID:	FB(20190304)		
Lab Sample ID:	JC83762-1	**Date Sampled:**	03/04/19
Matrix:	AQ - Field Blank Soil	**Date Received:**	03/04/19
		Percent Solids:	n/a
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	< 0.010	0.010	mg/l	1	03/04/19 21:28	JO	SW846 7196A
Redox Potential Vs H2	400		mv	1	03/06/19 17:19	EB	ASTM D1498-76
pH [a]	5.75		su	1	03/04/19 16:20	AS	SM4500H+ B-11

(a) Sample received out of holding time for pH analysis.

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-E18		
Lab Sample ID:	JC83762-2	**Date Sampled:**	03/04/19
Matrix:	SO - Soil	**Date Received:**	03/04/19
		Percent Solids:	73.9
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	1.4 J-	0.54	mg/kg	1	03/09/19 10:54	RI	SW846 3060A/7196A
Redox Potential Vs H2	294		mv	1	03/07/19 00:13	EB	ASTM D1498-76M
Solids, Percent	73.9		%	1	03/05/19 17:30	BG	SM2540 G 18TH ED MOD
pH	7.89 J		su	1	03/07/19 00:13	EB	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-E17		
Lab Sample ID:	JC83762-3	**Date Sampled:**	03/04/19
Matrix:	SO - Soil	**Date Received:**	03/04/19
		Percent Solids:	53.2
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	< 0.75 UJ-	0.75	mg/kg	1	03/09/19 10:58	RI	SW846 3060A/7196A
Redox Potential Vs H2	339		mv	1	03/07/19 00:20	EB	ASTM D1498-76M
Solids, Percent	53.2		%	1	03/05/19 17:30	BG	SM2540 G 18TH ED MOD
pH	6.92 J		su	1	03/07/19 00:15	EB	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID:	CS-F18		
Lab Sample ID:	JC83762-4	**Date Sampled:**	03/04/19
Matrix:	SO - Soil	**Date Received:**	03/04/19
		Percent Solids:	64.4
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	< 0.62 UJ-	0.62	mg/kg	1	03/09/19 10:58	RI	SW846 3060A/7196A
Redox Potential Vs H2	339		mv	1	03/07/19 00:23	EB	ASTM D1498-76M
Solids, Percent	64.4		%	1	03/05/19 17:30	BG	SM2540 G 18TH ED MOD
pH	7.80 J		su	1	03/07/19 00:17	EB	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-E18		
Lab Sample ID:	JC83762-2R	**Date Sampled:**	03/04/19
Matrix:	SO - Soil	**Date Received:**	03/04/19
		Percent Solids:	73.9
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	0.76	0.54	mg/kg	1	03/22/19 12:48	RI	SW846 3060A/7196A

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-E17		
Lab Sample ID:	JC83762-3R	**Date Sampled:**	03/04/19
Matrix:	SO - Soil	**Date Received:**	03/04/19
		Percent Solids:	53.2
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	2.1	0.75	mg/kg	1	03/22/19 12:51	RI	SW846 3060A/7196A

RL = Reporting Limit

Report of Analysis

Client Sample ID:	CS-F18		
Lab Sample ID:	JC83762-4R	**Date Sampled:**	03/04/19
Matrix:	SO - Soil	**Date Received:**	03/04/19
		Percent Solids:	64.4
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	20.0	0.62	mg/kg	1	03/22/19 12:51	RI	SW846 3060A/7196A

RL = Reporting Limit

Report of Analysis

Client Sample ID: FB(20190304)
Lab Sample ID: JC83762-1A
Matrix: AQ - Field Blank Soil
Project: PPG Site 107, 18 Chapel Avenue, Jersey City, NJ

Date Sampled: 03/04/19
Date Received: 03/04/19
Percent Solids: n/a

Total Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 6.0	6.0	ug/l	1	03/05/19	03/05/19	ND	SW846 6010D [1]	SW846 3010A [2]
Chromium	< 10	10	ug/l	1	03/05/19	03/05/19	ND	SW846 6010D [1]	SW846 3010A [2]
Nickel	< 10	10	ug/l	1	03/05/19	03/05/19	ND	SW846 6010D [1]	SW846 3010A [2]
Thallium	< 10	10	ug/l	1	03/05/19	03/05/19	ND	SW846 6010D [1]	SW846 3010A [2]
Vanadium	< 50	50	ug/l	1	03/05/19	03/05/19	ND	SW846 6010D [1]	SW846 3010A [2]

(1) Instrument QC Batch: MA46248
(2) Prep QC Batch: MP12856

RL = Reporting Limit

Report of Analysis

Client Sample ID:	FB(20190304)		
Lab Sample ID:	JC83762-1A	**Date Sampled:**	03/04/19
Matrix:	AQ - Field Blank Soil	**Date Received:**	03/04/19
		Percent Solids:	n/a
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	< 0.020	0.020	mg/l	1	03/05/19 17:09	ND	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-E18		
Lab Sample ID:	JC83762-2A	**Date Sampled:**	03/04/19
Matrix:	SO - Soil	**Date Received:**	03/04/19
		Percent Solids:	73.9
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 2.6	2.6	mg/kg	1	03/05/19	03/05/19	ND	SW846 6010D [1]	SW846 3050B [2]
Chromium	78.6	1.3	mg/kg	1	03/05/19	03/05/19	ND	SW846 6010D [1]	SW846 3050B [2]
Nickel	520	5.2	mg/kg	1	03/05/19	03/05/19	ND	SW846 6010D [1]	SW846 3050B [2]
Thallium	< 1.3	1.3	mg/kg	1	03/05/19	03/05/19	ND	SW846 6010D [1]	SW846 3050B [2]
Vanadium	29.9	6.5	mg/kg	1	03/05/19	03/05/19	ND	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA46248
(2) Prep QC Batch: MP12851

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-E18		
Lab Sample ID:	JC83762-2A	**Date Sampled:**	03/04/19
Matrix:	SO - Soil	**Date Received:**	03/04/19
		Percent Solids:	73.9
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	77.2	1.8	mg/kg	1	03/09/19 10:54	RI	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-E17		
Lab Sample ID:	JC83762-3A	**Date Sampled:**	03/04/19
Matrix:	SO - Soil	**Date Received:**	03/04/19
		Percent Solids:	53.2
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 3.6	3.6	mg/kg	1	03/05/19	03/05/19	ND	SW846 6010D [1]	SW846 3050B [2]
Chromium	129	1.8	mg/kg	1	03/05/19	03/05/19	ND	SW846 6010D [1]	SW846 3050B [2]
Nickel	77.6	7.2	mg/kg	1	03/05/19	03/05/19	ND	SW846 6010D [1]	SW846 3050B [2]
Thallium	< 1.8	1.8	mg/kg	1	03/05/19	03/05/19	ND	SW846 6010D [1]	SW846 3050B [2]
Vanadium	72.7	9.0	mg/kg	1	03/05/19	03/05/19	ND	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA46248
(2) Prep QC Batch: MP12851

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-E17		
Lab Sample ID:	JC83762-3A	**Date Sampled:**	03/04/19
Matrix:	SO - Soil	**Date Received:**	03/04/19
		Percent Solids:	53.2
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	129	2.6	mg/kg	1	03/09/19 10:58	RI	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	CS-F18		
Lab Sample ID:	JC83762-4A	**Date Sampled:**	03/04/19
Matrix:	SO - Soil	**Date Received:**	03/04/19
		Percent Solids:	64.4
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 3.1	3.1	mg/kg	1	03/05/19	03/05/19	ND	SW846 6010D [1]	SW846 3050B [2]
Chromium [a]	84.8	4.6	mg/kg	3	03/05/19	03/05/19	ND	SW846 6010D [1]	SW846 3050B [2]
Nickel	2810	18	mg/kg	3	03/05/19	03/05/19	ND	SW846 6010D [1]	SW846 3050B [2]
Thallium [a]	< 4.6	4.6	mg/kg	3	03/05/19	03/05/19	ND	SW846 6010D [1]	SW846 3050B [2]
Vanadium	24.6	7.7	mg/kg	1	03/05/19	03/05/19	ND	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA46248
(2) Prep QC Batch: MP12851

(a) Elevated detection limit due to dilution required for high interfering element.

RL = Reporting Limit

Report of Analysis

Client Sample ID:	CS-F18		
Lab Sample ID:	JC83762-4A	**Date Sampled:**	03/04/19
Matrix:	SO - Soil	**Date Received:**	03/04/19
		Percent Solids:	64.4
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	84.8	5.2	mg/kg	1	03/09/19 10:58	RI	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-E18		
Lab Sample ID:	JC83762-2RT	**Date Sampled:**	03/04/19
Matrix:	SO - Soil	**Date Received:**	03/04/19
		Percent Solids:	73.9
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Iron, Ferrous [a]	1.1 J	0.20	%	1	03/29/19 11:30	MP	ASTM D3872-86
~~Sulfide Screen [b]~~	~~NEGATIVE~~			~~1~~	~~03/29/19 11:30~~	~~MP~~	~~SM4500S2- A-11~~ R
Total Organic Carbon [c]	126000 J	140	mg/kg	1	03/29/19 22:28	JO	LLOYD KAHN 1988 MOD

(a) The ferrous iron test was analyzed after completion of Cr6 testing (outside of normal hold times for this parameter) in order to provide more information about the possible impact of the sample matrix on Cr6 recoveries.
(b) The sulfide screen test was analyzed after completion of Cr6 testing (outside of normal hold times for this parameter) in order to provide more information about the possible impact of the sample matrix on Cr6 recoveries.
(c) Analysis done out of holding time.

RL = Reporting Limit

ARCADIS Design & Consultancy for natural and built assets

PPG Industries

DATA QUALITY ASSESSMENT

Site 107 Fashionland

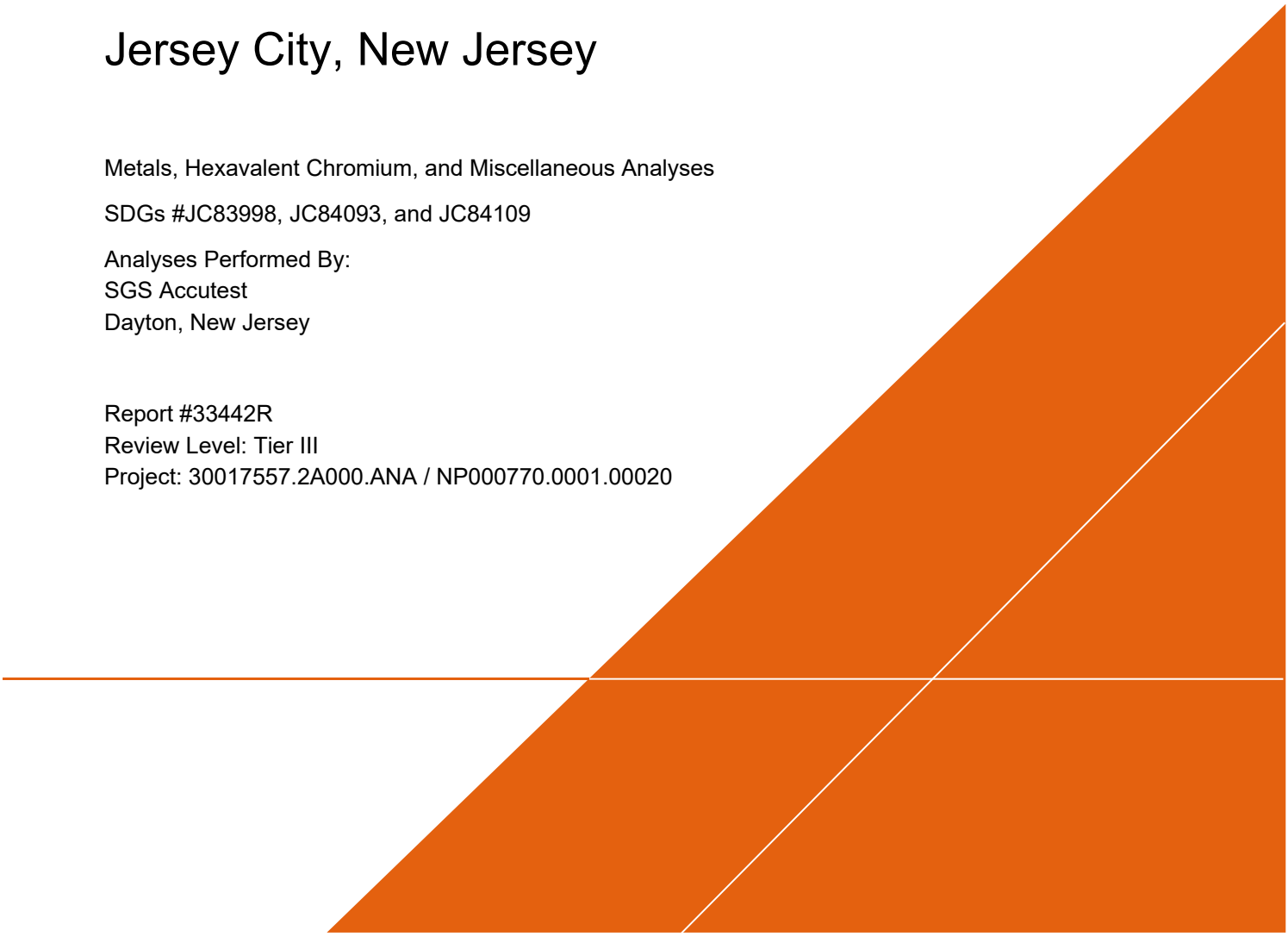
Jersey City, New Jersey

Metals, Hexavalent Chromium, and Miscellaneous Analyses

SDGs #JC83998, JC84093, and JC84109

Analyses Performed By:
SGS Accutest
Dayton, New Jersey

Report #33442R
Review Level: Tier III
Project: 30017557.2A000.ANA / NP000770.0001.00020



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Groups (SDGs) # JC83998, JC84093, and JC84109 for samples collected in association with the PPG Industries Site 107 Fashionland, Jersey City, New Jersey Site. The review was conducted as a Tier III evaluation and included review of data package completeness. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

SDG	Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis		
						Cr VI	MET	MISC
JC83998	FB(20190307)	JC83998-1	Water	3/7/2019		X	X	X
	BS-I15	JC83998-2	Soil	3/7/2019		X	X	X
	BS-H16	JC83998-3	Soil	3/7/2019		X	X	X
JC84093	FB(20190308)	JC84093-1	Water	3/8/2019		X	X	X
	BS-C17A	JC84093-2	Soil	3/8/2019		X	X	X
	BS-I16	JC84093-3	Soil	3/8/2019		X	X	X
	BS-E17	JC84093-4	Soil	3/8/2019		X	X	X
JC84109	FB(20190308)-A	JC84109-1	Water	3/8/2019			X	
	SW-A21(0.0-0.5)	JC84109-2	Soil	3/8/2019		X	X	X
	SW-A21(2.0-2.5)	JC84109-3	Soil	3/8/2019		X	X	X
	SW-A20(0.0-0.5)	JC84109-4	Soil	3/8/2019		X	X	X
	SW-A20(2.0-2.5)	JC84109-5	Soil	3/8/2019		X	X	X
	SW-A19(0.0-0.5)	JC84109-6	Soil	3/8/2019		X	X	X
	SW-A19(2.0-2.5)	JC84109-7	Soil	3/8/2019		X	X	X
	SW-A19(4.0-4.5)	JC84109-8	Soil	3/8/2019		X	X	X
	SW-A18(0.0-0.5)	JC84109-9	Soil	3/8/2019		X	X	X
	SW-A18(2.0-2.5)	JC84109-10	Soil	3/8/2019		X	X	X
	SW-A18(4.0-4.5)	JC84109-11	Soil	3/8/2019		X	X	X

Notes:

1. Metals include antimony, chromium, nickel, thallium, and vanadium. Trivalent chromium is reported by calculation (Chromium) – (Hexavalent Chromium).
2. Cr VI is hexavalent chromium.
3. Miscellaneous parameters include pH and redox potential.
4. SDGs #JC83998 and JC84093: Miscellaneous parameters for sample BS-H16 and BS-E17 also include ferrous iron, sulfide screen, and total organic carbon (TOC).

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X	X[1]		
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of QA or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

Note:

QA - Quality Assurance

[1] SDG #JC84109: An unpreserved sample container was not received for sample FB(20190308)-A. The hexavalent chromium, redox, and pH analyses for sample FB(20190308)-A were cancelled.

INORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Methods 6010C, 7196A, and 9045D; Standard Methods (SM) 4500H+B and SM4500S2-A; Lloyd Kahn; and ASTM D1498-76 and D3872-86. Data were reviewed in accordance with USEPA Region 2 SOP HW-2b, Revision 15 (December 2012); New Jersey Division of Remediation Management and Response Standard Operating Procedure for Analytical Data Validation of Hexavalent Chromium (September 2009); New Jersey Department of Environmental Protection Data Quality Assessment and Data Usability Evaluation Technical Guidance (April 2014); Field Sampling Plan/Quality Assurance Project Plan, PPG Non-Residential and Residential Chromium Sites, Hudson County, New Jersey (AECOM, June 2010); and Arcadis Quality Assurance Project Plan – Addendum, Site 107 Fashionland, Jersey City, New Jersey (Arcadis, June 2018).

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and that it was already subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with the USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but not detected. The associated value is the analyte instrument detection limit.

  B The reported value was obtained from a reading less than the reporting limit (RL), but greater than or equal to the method detection limit (MDL).

- Quantitation (Q) Qualifiers

  E The reported value is estimated due to the presence of interference.

  N Spiked sample recovery is not within control limits.

  * Duplicate analysis is not within control limits.

- Validation Qualifiers

  J The analyte was positively identified; however, the associated numerical value is an estimated concentration only.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UJ The analyte was not detected above the reporting limit. However, the reported limit is approximate and may or may not represent the actual limit of detection.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  R The data are unusable. The sample results are rejected due to serious deficiencies in meeting Quality Control (QC) critieria. The analyte may or may not be present in the sample.

Two facts should be noted by all data users. First, the “R” flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. “R” values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

METALS ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 6010C	Water	180 days from collection to analysis	Preserved to a pH of less than 2; Cool to <6°C
	Soil	180 days from collection to analysis	Cool to <6°C

All samples were analyzed within the specified holding times.

2. Blank Contamination

Quality assurance (QA) blanks (i.e., method and rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank is calculated for QA blanks containing concentrations greater than the method detection limit (MDL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Analytes were not detected above the MDL in the associated blanks; therefore, detected sample results were not associated with blank contamination.

3. Calibration

Satisfactory instrument calibration is established to provide that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument's continuing performance is satisfactory.

3.1 Initial Calibration and Continuing Calibration

The correct number and type of standards were analyzed. The correlation coefficient of the initial calibration was greater than 0.998 and all initial calibration verification standard and continuing calibration verification standard recoveries were within control limits of 90% to 110%.

All continuing calibration verification standard recoveries were within the control limit.

3.2 Low-Level Calibration Verification

The low-level initial and continuing calibration check standard serves to verify the linearity of calibration of the analysis at the reporting limit.

All RL standard recoveries were within control limits of 70% to 130% (50% to 150% for antimony and thallium).

3.3 ICP Interference Control Sample (ICS)

The ICS verifies the laboratories interelement and background correction factors.

All ICS exhibited recoveries within the control limits of 80% to 120%.

4. Matrix Spike/Matrix Spike Duplicate (MS/MSD)/Laboratory Duplicate Analysis

MS/MSD and laboratory duplicate data are used to assess the precision and accuracy of the analytical method.

4.1 MS/MSD Analysis

All metal analytes must exhibit a percent recovery within the established acceptance limits of 75% to 125%. The MS/MSD recovery control limits do not apply for MS/MSD performed on sample locations where the analyte's concentration detected in the parent sample exceeds the MS/MSD concentration by a factor of four or greater.

The MS/MSD analysis was not performed using a sample from these SDGs.

4.2 Laboratory Duplicate Analysis

The laboratory duplicate relative percent difference (RPD) criterion is applied when parent and duplicate sample concentrations are greater than or equal to 5 times the RL. A control limit of 20% for water matrices and 35% for soil matrices is applied when the criteria above is true. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of ± the RL is applied.

The laboratory duplicate analysis was not performed using a sample from these SDGs.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 50% for soil matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of three times the RL is applied for soil matrices.

A field duplicate sample was not collected in association with these SDGs.

6. Laboratory Control Sample (LCS) Analysis

The LCS analysis is used to assess the accuracy of the analytical method independent of matrix interferences. The analytes associated with the LCS analysis must exhibit a percent recovery between the control limits of 80% and 120%.

The LCS analysis exhibited recoveries and RPDs within the control limits.

7. Serial Dilution

The serial dilution analysis is used to assess if a significant physical or chemical interference exists due to sample matrix. Analytes exhibiting concentrations greater than 10 times the RL in the undiluted sample are evaluated to determine if matrix interference exists. These analytes are required to have less than a

10% difference (%D) between sample results from the undiluted (parent) sample and results associated with the same sample analyzed with a five-fold dilution.

The serial dilution analysis was not performed using a sample from these SDGs.

8. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR METALS

METALS: SW-846 6010C	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Inductively Coupled Plasma-Atomic Emission Spectrometry (ICP-AES)					
Tier II Validation					
Holding Times		X		X	
Reporting limits (units)		X		X	
Blanks					
A. Instrument Blanks		X		X	
B. Method Blanks		X		X	
C. Equipment/Field Blanks		X		X	
Laboratory Control Sample (LCS)		X		X	
Laboratory Control Sample Duplicate (LCSD)	X				X
LCS/LCSD Precision (RPD)	X				X
Matrix Spike (MS) %R	X				X
Matrix Spike Duplicate (MSD) %R	X				X
MS/MSD Precision (RPD)	X				X
Field/Lab Duplicate (RPD)	X				X
ICP Serial Dilution %D	X				X
Total vs. Dissolved	X				X
Reporting Limit Verification		X		X	
Tier III Validation					
Initial Calibration Verification		X		X	
Continuing Calibration Verification		X		X	
CRDL Standard Recovery		X		X	
ICP Interference Check		X		X	
ICP-MS Internal Standards	X				X
Transcription/calculations acceptable		X		X	
Raw Data	X				X
Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%R Percent recovery

RPD Relative percent difference

%D Percent difference

HEXAVALENT CHROMIUM ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 7196A	Water	24 hours from collection to analysis	Cool to <6°C
SW-846 3060A/ 7196A	Soil	30 days from collection to extraction; 7 days from extraction to analysis	Cool to <6°C

All samples were analyzed within the specified holding times.

2. Blank Contamination

Quality assurance (QA) blanks (i.e., method and rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank is calculated for QA blanks containing concentrations greater than the method detection limit (MDL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Analytes were not detected above the MDL in the associated blanks; therefore, detected sample results were not associated with blank contamination.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

The correct number and type of standards were analyzed. The correlation coefficient of the initial calibration was greater than 0.995 and all calibration verification standard recoveries were within control limits of 90% to 110%.

4. Matrix Spike (MS)/Post-Digestion Spike (PDS)/Laboratory Duplicate Analysis

MS, PDS, and laboratory duplicate data are used to assess the precision and accuracy of the analytical method.

4.1 MS Analysis

Soluble and insoluble spike sample analyses are designed to provide information about the effect of the sample matrix on the digestion and measurement methodology. The insoluble spike is used to evaluate the dissolution during the digestion process. Hexavalent chromium must exhibit a percent recovery within

the established acceptance limits of 75% to 125% in both the soluble and insoluble spiked analyses. The control limits do not apply when the parent sample concentration exceeds the spike amount by a factor of four or greater.

SDG #JC84109: The MS analysis performed on sample location SW-A18(0.0-0.5) in association with the insoluble hexavalent chromium analysis exhibited recoveries within the control limits.

SDGs #JC83998, JC84093, and JC84109: The MS analysis performed on sample locations BS-H16, BS-E17, and SW-A18(0.0-0.5) exhibited spike recoveries less than the lower control limits as presented in the table below.

Sample Location	Analyte	Initial Spike Recovery	Reanalysis Spike Recovery
BS-H16	Hexavalent Chromium, Insoluble	69.1%	68.2%
	Hexavalent Chromium, Soluble	< 50%	< 50%
BS-E17	Hexavalent Chromium, Insoluble	64.7%	64.9%
	Hexavalent Chromium, Soluble	< 50%	< 50%
SW-A18(0.0-0.5)	Hexavalent Chromium, Soluble	55.2%	AC (79.4%)

Notes:

AC = Acceptable

The criteria used to evaluate spike recoveries are presented in the following table. The qualifications are applied to all sample results associated with the sample preparation batch. In the event of a recovery outside of the control limits, the MS must be reanalyzed.

Control limit	Sample Result	Qualification[1]
Spike recovery ≥ 50% but < 75%	Non-detect	UJ-
	Detect	J-
Spike recovery < 50%	Non-detect	R
	Detect	R
Spike recovery > 125%	Non-detect	No Action
Spike recovery > 125% but ≤ 150%	Detect	J+
Spike recovery > 150%	Detect	R

Notes:

[1] If recoveries are < 50% or > 150% for both insoluble and soluble spikes, associated data will be rejected ("R"); otherwise qualify associated data if one of the spikes is outside the < 50% or > 150% limits.

SDGs #JC83998 and JC84093: The original analyses of the field samples are usable with appropriate qualification. No sample results were rejected.

SDG #JC84109: The reanalysis of the field samples are usable; no qualification of the results was required.

4.2 Post-Digestion Spike (PDS) Analysis

The PDS analysis is designed to verify that neither a reducing condition nor a chemical interference is affecting the analysis. This is accomplished by analyzing a second aliquot of the pH-adjusted filtrate that has been spiked with hexavalent chromium. The PDS must exhibit a percent recovery within the method acceptance limits of 85% to 115%.

SDG #JC84109: The PDS analysis performed on sample location SW-A18(0.0-0.5) exhibited recoveries within the control limits.

SDGs #JC83998 and JC84093: The PDS analysis performed on sample locations BS-H16 and BS-E17 exhibited a recovery outside of the control limits as presented in the table below.

Sample Location	Analyte	PDS Recovery	Reanalysis PDS Recovery
BS-H16	Hexavalent Chromium	< 85%	< 85%
BS-E17	Hexavalent Chromium	< 85%	< 85%

Since all the samples are from the same site, it is assumed the matrix interference exists for all samples in a reducing environment. It was noted from the Eh pH results that soil samples are in a reducing environment and don't support the presence of hexavalent chromium.

The criteria used to evaluate spike recoveries are presented in the following table. The qualifications are applied to all sample results associated with the sample preparation batch.

Control limit	Sample Result	Qualification
PDS recovery < 85%	Non-detect	UJ-
	Detect	J-
PDS recovery > 115%	Non-detect	No Action
PDS recovery > 115%	Detect	J+

4.3 Laboratory Duplicate Analysis

The laboratory duplicate relative percent difference (RPD) criterion is applied when parent and duplicate sample concentrations are greater than or equal to four times the RL. A control limit of 20% is applied when the criteria above is true. In the instance when the parent and/or duplicate sample concentrations are less than or equal to four times the RL, a control limit of ± the RL is used.

SDGs #JC83998, JC84093: The laboratory duplicate analysis performed on sample locations BS-H16, BS-E17 exhibited results within the control limit.

SDG #JC84109: All analytes associated with laboratory duplicate were within the control limit, with the exception of the analytes presented in the following table.

Sample Location	Analytes	Laboratory Duplicate RPD	Reanalysis Laboratory Duplicate RPD
SW-A18(0.0-0.5)	Hexavalent Chromium	54.5%	53.3%

The criteria used to evaluate laboratory duplicate RPD are presented in the following table. In the case of a laboratory duplicate RPD deviation, the sample results are qualified. The qualifications are applied to all sample results associated with the sample preparation batch.

Sample Concentration	Control Limit	Sample Result	Qualification
Parent sample and/or laboratory duplicate sample result > four times the RL	> 20%	Non-detect	UJ
		Detect	J
Parent sample and/or laboratory duplicate sample result < four times the RL	± RL	Non-detect	UJ
		Detect	J

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 50% for soil matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of three times the RL is applied for soil matrices.

A field duplicate sample was not collected in association with these SDGs.

6. Laboratory Control Sample (LCS) Analysis

The LCS analysis is used to assess the precision and accuracy of the analytical method independent of matrix interferences. The analytes associated with the LCS analysis must exhibit a percent recovery between the control limits of 80% and 120%.

The LCS analysis exhibited recoveries within the control limits.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR HEXAVALENT CHROMIUM

HEXAVALENT CHROMIUM: SW-846 7196A	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Spectrophotometer					
Tier II Validation					
Holding Times		X		X	
Reporting limits (units)		X		X	
Blanks					
A. Instrument Blanks		X		X	
B. Method Blanks		X		X	
C. Equipment/Field Blanks		X		X	
Laboratory Control Sample (LCS)		X		X	
Matrix Spike (MS) %R		X	X		
Matrix Spike Duplicate (MSD) %R	X				X
MS/MSD Precision (RPD)	X				X
Post Digestion Spike %R		X	X		
Field/Lab Duplicate (RPD)		X	X		
Dilution Factor		X		X	
Tier III Validation					
Initial calibration %RSD or correlation coefficient		X		X	
Continuing calibration %R		X		X	
Raw Data		X		X	
Transcription/calculation errors present		X		X	
Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%R Percent recovery

RPD Relative percent difference

%RSD Relative percent deviation

GENERAL CHEMISTRY ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
pH by SM4500H+B	Water	QAPP: 24 hours of receipt at laboratory	Cool to <6°C
pH by SW846 9045D	Soil	QAPP: 24 hours of receipt at laboratory	Cool to <6°C
Oxidation-Reduction Potential by ASTM D1498-76	Water	Not applicable	Cool to <6°C
Oxidation-Reduction Potential (Redox) by ASTM D1498-76	Soil	Measure immediately after creating leachate	Cool to <6°C
Ferrous Iron by ASTM D3872-86	Soil	24 hours from collection to analysis	Cool to <6°C
Sulfide Screen by SM4500S2-A	Soil	7 days from collection to analysis	Cool to <6°C
Total Organic Carbon (TOC) by Lloyd Kahn	Soil	14 days from collection to analysis	Cool to <6°C

The analyses that exceeded the holding are presented in the following table.

Sample Locations	Method	Holding Time	Criteria
BS-C17A BS-I16 BS-E17 SW-A21(0.0-0.5) SW-A21(2.0-2.5) SW-A20(0.0-0.5) SW-A20(2.0-2.5) SW-A19(0.0-0.5) SW-A19(2.0-2.5) SW-A19(4.0-4.5) SW-A18(0.0-0.5) SW-A18(2.0-2.5) SW-A18(4.0-4.5)	SW846 9045D	Analysis: 5 days	< 24 hours of receipt by laboratory
BS-I15 BS-H16		Analysis: 6 days	
BS-E17	ASTM D3872-86	Analysis: 21 days	< 24 hours from collection
BS-H16		Analysis: 22 days	

Sample Locations	Method	Holding Time	Criteria
BS-E17	SM4500S2-A	Analysis: 21 days	< 7 days from collection
BS-H16		Analysis: 22 days	
BS-E17	Lloyd Kahn	Analysis: 21 days	< 14 days from collection
BS-H16		Analysis: 22 days	

Sample results were qualified as specified in the table below. All other holding times were met.

Criteria	Qualification	
	Detected Analytes	Non-detect Analytes
Analysis completed less than two times holding time	J	UJ
Analysis completed greater than two times holding time	J	R

2. Blank Contamination

Quality assurance (QA) blanks (i.e., method and rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank is calculated for QA blanks containing concentrations greater than the method detection limit (MDL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Method blank analysis is not applicable for Redox and pH analyses.

Ferrous iron, sulfide, and TOC were not detected above the MDL in the associated blanks; therefore, detected sample results were not associated with blank contamination.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

The correct number and type of standards were analyzed. All buffer check results were within acceptance limits.

4. Laboratory Duplicate Analysis

Laboratory duplicate data are used to assess the precision of the analytical method. The laboratory duplicate relative percent difference (RPD) criterion is applied when parent and duplicate sample concentrations are greater than or equal to 5 times the RL. A control limit of 20% for water matrices and 35% for soil matrices is applied when the criteria above is true. In the instance when the parent and/or

duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of ± the RL is applied.

SDGs #JC83998 and JC84093: The laboratory duplicate analysis was not performed using a sample from these SDGs.

SDGs #JC84109: The laboratory duplicate analysis performed on sample location SW-A18(0.0-0.5) exhibited results within the control limit.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 50% for soil matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of three times the RL is applied for soil matrices.

A field duplicate sample was not collected in association with these SDGs.

6. Laboratory Control Sample (LCS) Analysis

The LCS analysis is used to assess the precision and accuracy of the analytical method independent of matrix interferences. The analytes associated with the LCS analysis must exhibit a percent recovery between the control limits of 80% and 120%.

LCS results for redox potential, pH, and sulfide screen were not reported in the analytical report.

The LCS analysis performed in association with ferrous iron and TOC exhibited recoveries within the control limits.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR GENERAL CHEMISTRY

General Chemistry: SM4500H+B, SW846 9045D, ASTM D1498-76	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Miscellaneous Instrumentation					
Tier II Validation					
Holding times		X	X		
Reporting limits (units)		X		X	
Blanks					
A. Instrument Blanks		X		X	
B. Method blanks		X		X	
C. Equipment blanks		X		X	
Laboratory Control Sample (LCS) %R		X		X	
Laboratory Control Sample Duplicate (LCSD) %R	X				X
LCS/LCSD Precision (RPD)	X				X
Matrix Spike (MS) %R	X				X
Matrix Spike Duplicate (MSD) %R	X				X
MS/MSD Precision (RPD)	X				X
Field/Lab Duplicate (RPD)		X		X	
Dilution Factor		X		X	
Tier III Validation					
Initial calibration %RSD or correlation coefficient	X				X
Continuing calibration %R	X				X
Raw Data		X		X	
Transcription/calculation errors present		X		X	
Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%R Percent recovery

RPD Relative percent difference

VALIDATION PERFORMED BY: Jennifer Singer

SIGNATURE: 

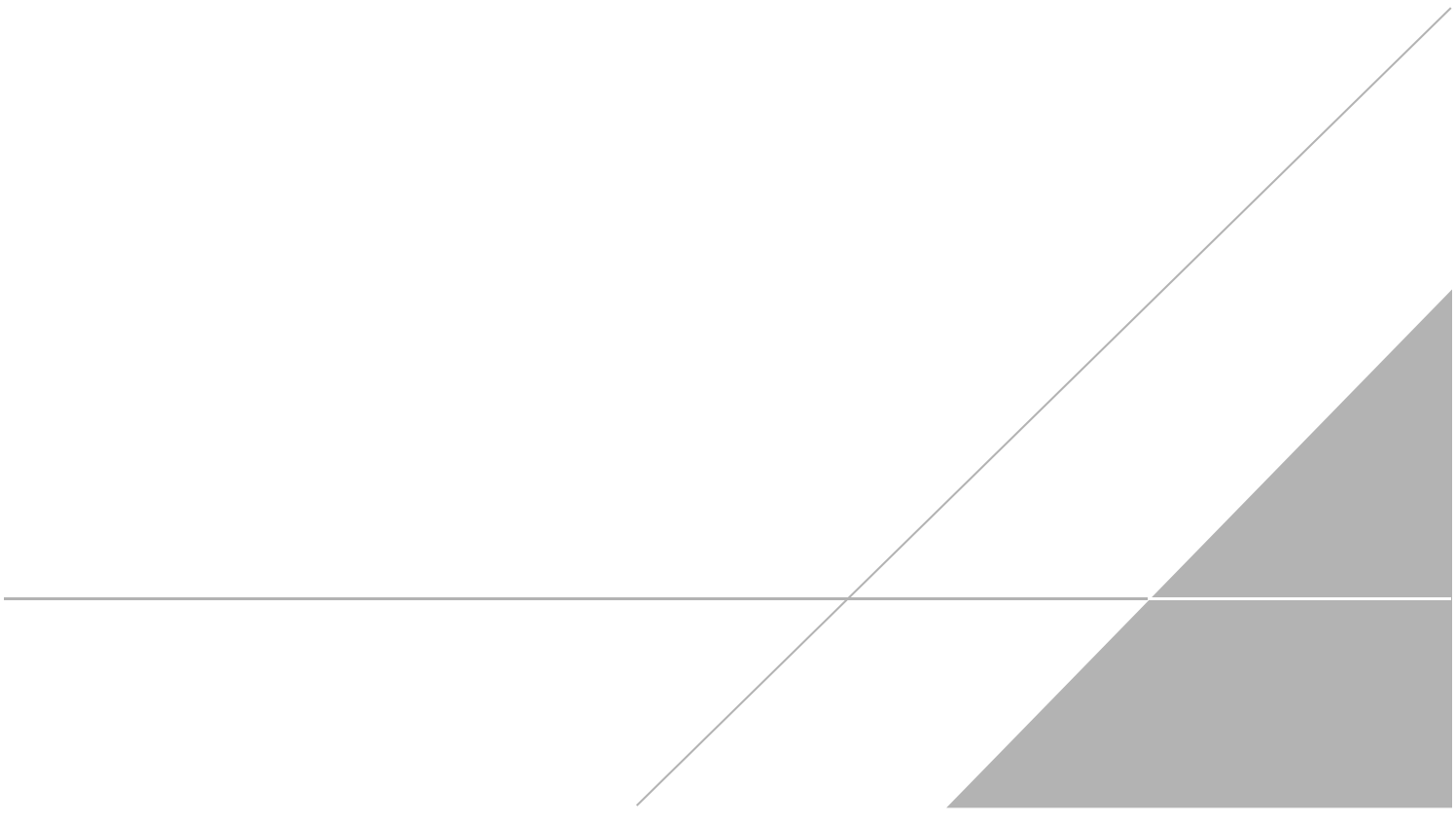
DATE: July 15, 2019

PEER REVIEW: Dennis Capria

DATE: July 18, 2019

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS



CHAIN OF CUSTODY

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SO FB

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FED-EX Tracking #:
SGS Quote #:
Bottle Order Control #: AR-011719-176
SGS Job #: JC83998

Client / Reporting Information

Company Name: Arcadis
Street Address: 10 Friends Lane
City: Newtown State: PA Zip: 18940
Project Contact: Matt Bell E-mail:
Phone #: 646.752.5629 Fax #:
Sampler(s) Name(s): C. Cahill, D. Hollinsky Phone #:

Project Information

Project Name: PPG Jersey City Site 107
Street: 18 Chapel Ave
City: Jersey City State: NJ
Project #: NP000770.0003
Client Purchase Order #:
Project Manager: Jim McLaughlin

Billing Information (if different from Report to)

Company Name:
Street Address:
City: State: Zip:
Attention:

Requested Analysis (see TEST CODE sheet)

Lab Sample #	Field ID / Point of Collection	MEOH/DI Vial #	Collection Date	Collection Time	Sampled by	Matrix	# of bottles	HCl	NaOH	HNO3	H2SO4	NONE	DI Water	MEOH	ENCORE	Total Chromium	Trivalent Chromium	Hexavalent Chromium	Antimony	Nickel	Thallium	Vanadium	LAB USE ONLY
1	FB(20190307)		3/7/19	1400	DH	FB	2			1		1				X	X	X	X	X	X	X	
2	BS - I15		3/7/19	1015	CC	SO	1					1				X	X	X	X	X	X	X	AC7
3	BS - H16		3/7/19	1400	CC	SO	1					1				X	X	X	X	X	X	X	MG
																							CB

Matrix Codes: DW - Drinking Water; GW - Ground Water; WW - Water; SW - Surface Water; SO - Soil; SL - Sludge; SED-Sediment; OI - Oil; LIQ - Other Liquid; AIR - Air; SOL - Other Solid; WP - Wipe; FB-Field Blank; EB-Equipment Blank; RB- Rinse Blank; TB-Trip Blank

Turnaround Time (Business days)

- [ ] Std. 10 Business Days
- [ ] 5 Day RUSH
- [ ] 3 Day RUSH
- [X] 2 Day RUSH
- [ ] 1 Day RUSH
- [ ] other

Emergency & Rush T/A data available via LabLink

Approved by (SGS Project Manager)/Date:

Data Deliverable Information

- [ ] Commercial "A" (Level 1)
- [ ] Commercial "B" (Level 2)
- [ ] FULLT1 (Level 3+4)
- [ ] NJ Reduced
- [ ] Commercial "C"
- [ ] NJ Data of Known Quality Protocol Reporting
- [ ] NYASP Category A
- [ ] NYASP Category B
- [ ] State Forms
- [X] EDD Format Equis
- [ ] Other

Commercial "A" = Results Only; Commercial "B" = Results + QC Summary
NJ Reduced = Results + QC Summary + Partial Raw data

Comments / Special Instructions

INITIAL ASESSMENT AC 2A
LABEL VERIFICATION

Sample inventory is verified upon receipt in the Laboratory

Sample Custody must be documented below each time samples change possession, including courier delivery.

	Relinquished by Sampler:	Date Time:	Received By:	Relinquished By:	Date Time:	Received By:
1		3/7/19 1430	1 Robert Chambers	2 Robert Chambers	3.7.19 1600	2
3			3	4		4
5			5	Custody Seal # 03153	Intact / Not intact	Preserved where applicable: On Ice: X Cooler Temp: IC 3.2°C

Form:SM088-03C (revised 2/12/18)

http://www.sgs.com/en/terms-and-conditions.

5.2 5

JC83998: Chain of Custody
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Report of Analysis

Client Sample ID:	FB(20190307)		
Lab Sample ID:	JC83998-1	**Date Sampled:**	03/07/19
Matrix:	AQ - Field Blank Soil	**Date Received:**	03/07/19
		Percent Solids:	n/a
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	< 0.010	0.010	mg/l	1	03/07/19 22:06	JO	SW846 7196A
Redox Potential Vs H2	469		mv	1	03/12/19 20:48	EB	ASTM D1498-76
pH [a]	5.68		su	1	03/07/19 17:03	SUB	SM4500H+ B-11

(a) Sample received out of holding time for pH analysis.

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-I15		
Lab Sample ID:	JC83998-2	**Date Sampled:**	03/07/19
Matrix:	SO - Soil	**Date Received:**	03/07/19
		Percent Solids:	74.4
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	< 0.54 UJ-	0.54	mg/kg	1	03/15/19 23:00	JOO	SW846 3060A/7196A
Redox Potential Vs H2	165		mv	1	03/13/19 19:49	EB	ASTM D1498-76M
Solids, Percent	74.4		%	1	03/08/19 09:21	RC	SM2540 G 18TH ED MOD
pH	6.86 J		su	1	03/13/19 19:52	EB	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-H16		
Lab Sample ID:	JC83998-3	**Date Sampled:**	03/07/19
Matrix:	SO - Soil	**Date Received:**	03/07/19
		Percent Solids:	71.0
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	< 0.56 UJ-	0.56	mg/kg	1	03/15/19 22:52	JOO	SW846 3060A/7196A
Redox Potential Vs H2	225		mv	1	03/13/19 19:54	EB	ASTM D1498-76M
Solids, Percent	71		%	1	03/08/19 09:21	RC	SM2540 G 18TH ED MOD
pH	6.73 J		su	1	03/13/19 19:54	EB	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-I15		
Lab Sample ID:	JC83998-2R	**Date Sampled:**	03/07/19
Matrix:	SO - Soil	**Date Received:**	03/07/19
		Percent Solids:	74.4
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	< 0.54	0.54	mg/kg	1	03/22/19 17:42	RI	SW846 3060A/7196A

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-H16		
Lab Sample ID:	JC83998-3R	**Date Sampled:**	03/07/19
Matrix:	SO - Soil	**Date Received:**	03/07/19
		Percent Solids:	71.0
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	< 0.56	0.56	mg/kg	1	03/22/19 17:39	RI	SW846 3060A/7196A

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-H16		
Lab Sample ID:	JC83998-3RT	**Date Sampled:**	03/07/19
Matrix:	SO - Soil	**Date Received:**	03/07/19
		Percent Solids:	71.0
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Iron, Ferrous [a]	0.48 J	0.20	%	1	03/29/19 11:30	MP	ASTM D3872-86
~~Sulfide Screen [b]~~	~~NEGATIVE~~			~~1~~	~~03/29/19 11:30~~	~~MP~~	~~SM4500S2- A-11~~ R
Total Organic Carbon [c]	22800 J	140	mg/kg	1	03/29/19 18:01	JO	LLOYD KAHN 1988 MOD

(a) The ferrous iron test was analyzed after completion of Cr6 testing (outside of normal hold times for this parameter) in order to provide more information about the possible impact of the sample matrix on Cr6 recoveries.
(b) The sulfide screen test was analyzed after completion of Cr6 testing (outside of normal hold times for this parameter) in order to provide more information about the possible impact of the sample matrix on Cr6 recoveries.
(c) Analysis done out of holding time.

RL = Reporting Limit

Report of Analysis

Client Sample ID: FB(20190307)
Lab Sample ID: JC83998-1A
Matrix: AQ - Field Blank Soil
Project: PPG Site 107, 18 Chapel Avenue, Jersey City, NJ

Date Sampled: 03/07/19
Date Received: 03/07/19
Percent Solids: n/a

Total Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 6.0	6.0	ug/l	1	03/07/19	03/08/19	ND	SW846 6010D [1]	SW846 3010A [2]
Chromium	< 10	10	ug/l	1	03/07/19	03/08/19	ND	SW846 6010D [1]	SW846 3010A [2]
Nickel	< 10	10	ug/l	1	03/07/19	03/08/19	ND	SW846 6010D [1]	SW846 3010A [2]
Thallium	< 10	10	ug/l	1	03/07/19	03/08/19	ND	SW846 6010D [1]	SW846 3010A [2]
Vanadium	< 50	50	ug/l	1	03/07/19	03/08/19	ND	SW846 6010D [1]	SW846 3010A [2]

(1) Instrument QC Batch: MA46274
(2) Prep QC Batch: MP12932

RL = Reporting Limit

Report of Analysis

Client Sample ID:	FB(20190307)		
Lab Sample ID:	JC83998-1A	**Date Sampled:**	03/07/19
Matrix:	AQ - Field Blank Soil	**Date Received:**	03/07/19
		Percent Solids:	n/a
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	< 0.020	0.020	mg/l	1	03/08/19 17:46	ND	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-I15		
Lab Sample ID:	JC83998-2A	**Date Sampled:**	03/07/19
Matrix:	SO - Soil	**Date Received:**	03/07/19
		Percent Solids:	74.4
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 2.7	2.7	mg/kg	1	03/07/19	03/08/19	ND	SW846 6010D [1]	SW846 3050B [2]
Chromium	15.1	1.3	mg/kg	1	03/07/19	03/08/19	ND	SW846 6010D [1]	SW846 3050B [2]
Nickel	21.5	5.3	mg/kg	1	03/07/19	03/08/19	ND	SW846 6010D [1]	SW846 3050B [2]
Thallium	< 1.3	1.3	mg/kg	1	03/07/19	03/08/19	ND	SW846 6010D [1]	SW846 3050B [2]
Vanadium	16.9	6.7	mg/kg	1	03/07/19	03/08/19	ND	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA46274
(2) Prep QC Batch: MP12917

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-I15		
Lab Sample ID:	JC83998-2A	**Date Sampled:**	03/07/19
Matrix:	SO - Soil	**Date Received:**	03/07/19
		Percent Solids:	74.4
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	15.1	1.8	mg/kg	1	03/15/19 23:00	JOO	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-H16		
Lab Sample ID:	JC83998-3A	**Date Sampled:**	03/07/19
Matrix:	SO - Soil	**Date Received:**	03/07/19
		Percent Solids:	71.0
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 2.7	2.7	mg/kg	1	03/07/19	03/08/19	ND	SW846 6010D [1]	SW846 3050B [2]
Chromium	12.6	1.4	mg/kg	1	03/07/19	03/08/19	ND	SW846 6010D [1]	SW846 3050B [2]
Nickel	11.9	5.4	mg/kg	1	03/07/19	03/08/19	ND	SW846 6010D [1]	SW846 3050B [2]
Thallium	< 1.4	1.4	mg/kg	1	03/07/19	03/08/19	ND	SW846 6010D [1]	SW846 3050B [2]
Vanadium	18.0	6.8	mg/kg	1	03/07/19	03/08/19	ND	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA46274
(2) Prep QC Batch: MP12917

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-H16		
Lab Sample ID:	JC83998-3A	**Date Sampled:**	03/07/19
Matrix:	SO - Soil	**Date Received:**	03/07/19
		Percent Solids:	71.0
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	12.6	2.0	mg/kg	1	03/15/19 22:52	JOO	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

SP FB

SGS

CHAIN OF CUSTODY

SGS North America Inc. - Dayton
2235 Route 130, Dayton, NJ 08810
TEL. 732-329-0200 FAX: 732-329-3499/3480
www.sgs.com/ehsusa

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E

FED-EX Tracking #
Bottle Order Control #: AH-011719-174
SGS Quote #
SGS Job #: JC84093

Client / Reporting Information
Company Name: Arcadis
Street Address: 10 Friends Lane
City: Jersey City State: NJ Zip: 10440
Project Contact: Matt Bell E-mail
Phone #: 646.752.5629
Sampler(s) Name(s): Christa Cifelli Phone #

Project Information
Project Name: PPG Jersey City Site 107
Street: 18 Chapel Ave
City: Jersey City State: NJ
Project #: N8000770.0003
Client Purchase Order #
Project Manager: Jim McLaughlin

Billing Information (if different from Report to)
Company Name
Street Address
City State Zip
Attention:

Requested Analysis: Total Chromium, Trivalent Chromium, Hexavalent Chromium, Antimony, Nickel, Thallium, Vanadium

Matrix Codes: DW - Drinking Water, GW - Ground Water, WW - Water, SW - Surface Water, SO - Soil, SL - Sludge, SED - Sediment, OI - Oil, LIQ - Other Liquid, AIR - Air, SOL - Other Solid, WP - Wipe, FB - Field Blank, EB - Equipment Blank, RB - Rinse Blank, TB - Trip Blank

SGS Sample #	Field ID / Point of Collection	MEOH/DI Vial #	Date	Time	Sampled by	Grab (G) Comp (C)	Matrix	# of bottles	HCl	NaOH	HNO_3	H_2SO_4	NONE	DI Water	MEOH	ENCORE	Total Chromium	Trivalent Chromium	Hexavalent Chromium	Antimony	Nickel	Thallium	Vanadium	LAB USE ONLY
1	FB (20190308)		3/8/19	0845	CC	G	FB	2			1		1				X	X	X	X	X	X	X	
2	BS-C17A		3/8/19	1100	CC	G	SO	1					1				X	X	X	X	X	X	X	
3	BS-I16		3/8/19	1130	CC	G	SO	1					1				X	X	X	X	X	X	X	A19
4	BS-E17		3/8/19	1300	CC	G	SO	1					1				X	X	X	X	X	X	X	M18
																								C43

Turn Around Time (Business Days)
Approved By (SGS PM): / Date:
- [ ] 10 Business Days
- [ ] 5 Business Days
- [ ] 3 Business Days*
- [x] 2 Business Days*
- [ ] 1 Business Day*
- [ ] Other

All data available via Lablink
* Approval needed for 1-3 Business Day TAT

Deliverable
- [ ] Commercial "A" (Level 1)
- [ ] Commercial "B" (Level 2)
- [ ] NJ Reduced (Level 3)
- [ ] Full Tier I (Level 4)
- [ ] Commercial "C"
- [ ] NJ DKQP
- [ ] NYASP Category A
- [ ] NYASP Category B
- [ ] MA MCP Criteria
- [ ] CT RCP Criteria
- [ ] State Forms
- [x] EDD Format EQuIS
- [ ] DOD-QSM5

Commercial "A" = Results only; Commercial "B" = Results + QC Summary
Commercial "C" = Results + QC Summary + Partial Raw data

Comments / Special Instructions

http://www.sgs.com/en/terms-and-conditions

Sample Custody must be documented below each time samples change possession, including courier delivery.

Relinquished by:	Date / Time:	Received By:	Relinquished By:	Date / Time:	Received By:
1 C. Cifelli	3/8/19 1410	1 Robert Chambers	2 Robert Chambers	3.8.19 1701	2 [signature]
3		3	4		4
5		5	Custody Seal # 25086	Intact / Not intact; Preserved where applicable; Absent; Therm. ID:	On Ice X; Cooler Temp. °C: IP 3.3 °C

INITIAL ASSESSMENT LR 2B
LABEL VERIFICATION

EHSA-QAC-0023-02-FORM-Dayton - Standard COC.xlsx

5.2 5

JC84093: Chain of Custody
Page 1 of 3

Report of Analysis

Client Sample ID:	FB(20190308)		
Lab Sample ID:	JC84093-1	**Date Sampled:**	03/08/19
Matrix:	AQ - Field Blank Soil	**Date Received:**	03/08/19
		Percent Solids:	n/a
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	< 0.010	0.010	mg/l	1	03/08/19 20:20	JOO	SW846 7196A
Redox Potential Vs H2	467		mv	1	03/12/19 21:08	EB	ASTM D1498-76
pH [a]	5.66		su	1	03/08/19 18:00	SUB	SM4500H+ B-11

(a) Sample received out of holding time for pH analysis.

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-C17A		
Lab Sample ID:	JC84093-2	**Date Sampled:**	03/08/19
Matrix:	SO - Soil	**Date Received:**	03/08/19
		Percent Solids:	69.9
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	< 0.57 UJ-	0.57	mg/kg	1	03/14/19 17:30	RI	SW846 3060A/7196A
Redox Potential Vs H2	263		mv	1	03/13/19 20:10	EB	ASTM D1498-76M
Solids, Percent	69.9		%	1	03/10/19 14:00	BG	SM2540 G 18TH ED MOD
pH	6.39 J		su	1	03/13/19 20:03	EB	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID: BS-I16
Lab Sample ID: JC84093-3
Matrix: SO - Soil
Project: PPG Site 107, 18 Chapel Avenue, Jersey City, NJ

Date Sampled: 03/08/19
Date Received: 03/08/19
Percent Solids: 72.8

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	< 0.55 UJ-	0.55	mg/kg	1	03/14/19 17:30	RI	SW846 3060A/7196A
Redox Potential Vs H2	168		mv	1	03/13/19 20:17	EB	ASTM D1498-76M
Solids, Percent	72.8		%	1	03/10/19 14:00	BG	SM2540 G 18TH ED MOD
pH	6.78 J		su	1	03/13/19 20:05	EB	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-E17		
Lab Sample ID:	JC84093-4	**Date Sampled:**	03/08/19
Matrix:	SO - Soil	**Date Received:**	03/08/19
		Percent Solids:	67.5
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	< 0.59 UJ-	0.59	mg/kg	1	03/14/19 17:27	RI	SW846 3060A/7196A
Redox Potential Vs H2	202		mv	1	03/13/19 20:20	EB	ASTM D1498-76M
Solids, Percent	67.5		%	1	03/10/19 14:00	BG	SM2540 G 18TH ED MOD
pH	6.87 J		su	1	03/13/19 20:10	EB	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-C17A		
Lab Sample ID:	JC84093-2R	**Date Sampled:**	03/08/19
Matrix:	SO - Soil	**Date Received:**	03/08/19
		Percent Solids:	69.9
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	< 0.57	0.57	mg/kg	1	03/22/19 14:11	RI	SW846 3060A/7196A

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-I16		
Lab Sample ID:	JC84093-3R	**Date Sampled:**	03/08/19
Matrix:	SO - Soil	**Date Received:**	03/08/19
		Percent Solids:	72.8
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	< 0.55	0.55	mg/kg	1	03/22/19 14:11	RI	SW846 3060A/7196A

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-E17		
Lab Sample ID:	JC84093-4R	**Date Sampled:**	03/08/19
Matrix:	SO - Soil	**Date Received:**	03/08/19
		Percent Solids:	67.5
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	< 0.59	0.59	mg/kg	1	03/22/19 14:03	RI	SW846 3060A/7196A

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-E17		
Lab Sample ID:	JC84093-4RT	**Date Sampled:**	03/08/19
Matrix:	SO - Soil	**Date Received:**	03/08/19
		Percent Solids:	67.5
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Iron, Ferrous [a]	0.80 J	0.20	%	1	03/29/19 11:30	MP	ASTM D3872-86
~~Sulfide Screen [b]~~	~~NEGATIVE~~			~~1~~	~~03/29/19 11:30~~	~~MP~~	~~SM4500S2- A-11~~ R
Total Organic Carbon [c]	45600 J	150	mg/kg	1	03/29/19 18:27	JO	LLOYD KAHN 1988 MOD

(a) The ferrous iron test was analyzed after completion of Cr6 testing (outside of normal hold times for this parameter) in order to provide more information about the possible impact of the sample matrix on Cr6 recoveries.
(b) The sulfide screen test was analyzed after completion of Cr6 testing (outside of normal hold times for this parameter) in order to provide more information about the possible impact of the sample matrix on Cr6 recoveries.
(c) Analysis done out of holding time.

RL = Reporting Limit

Report of Analysis

Client Sample ID: FB(20190308)
Lab Sample ID: JC84093-1A
Matrix: AQ - Field Blank Soil
Project: PPG Site 107, 18 Chapel Avenue, Jersey City, NJ

Date Sampled: 03/08/19
Date Received: 03/08/19
Percent Solids: n/a

Total Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 6.0	6.0	ug/l	1	03/11/19	03/11/19	ND	SW846 6010D [1]	SW846 3010A [2]
Chromium	< 10	10	ug/l	1	03/11/19	03/11/19	ND	SW846 6010D [1]	SW846 3010A [2]
Nickel	< 10	10	ug/l	1	03/11/19	03/11/19	ND	SW846 6010D [1]	SW846 3010A [2]
Thallium	< 10	10	ug/l	1	03/11/19	03/11/19	ND	SW846 6010D [1]	SW846 3010A [2]
Vanadium	< 50	50	ug/l	1	03/11/19	03/11/19	ND	SW846 6010D [1]	SW846 3010A [2]

(1) Instrument QC Batch: MA46281
(2) Prep QC Batch: MP12984

RL = Reporting Limit

Report of Analysis

Client Sample ID:	FB(20190308)		
Lab Sample ID:	JC84093-1A	**Date Sampled:**	03/08/19
Matrix:	AQ - Field Blank Soil	**Date Received:**	03/08/19
		Percent Solids:	n/a
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	< 0.020	0.020	mg/l	1	03/11/19 18:51	ND	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-C17A		
Lab Sample ID:	JC84093-2A	**Date Sampled:**	03/08/19
Matrix:	SO - Soil	**Date Received:**	03/08/19
		Percent Solids:	69.9
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 2.9	2.9	mg/kg	1	03/11/19	03/11/19	GT	SW846 6010D [1]	SW846 3050B [2]
Chromium	15.8	1.5	mg/kg	1	03/11/19	03/11/19	GT	SW846 6010D [1]	SW846 3050B [2]
Nickel	14.0	5.8	mg/kg	1	03/11/19	03/11/19	GT	SW846 6010D [1]	SW846 3050B [2]
Thallium	< 1.5	1.5	mg/kg	1	03/11/19	03/11/19	GT	SW846 6010D [1]	SW846 3050B [2]
Vanadium	22.5	7.3	mg/kg	1	03/11/19	03/11/19	GT	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA46280
(2) Prep QC Batch: MP12949

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-C17A		
Lab Sample ID:	JC84093-2A	**Date Sampled:**	03/08/19
Matrix:	SO - Soil	**Date Received:**	03/08/19
		Percent Solids:	69.9
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	15.8	2.1	mg/kg	1	03/14/19 17:30	RI	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-I16		
Lab Sample ID:	JC84093-3A	**Date Sampled:**	03/08/19
Matrix:	SO - Soil	**Date Received:**	03/08/19
		Percent Solids:	72.8
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 2.8	2.8	mg/kg	1	03/11/19	03/11/19	GT	SW846 6010D [1]	SW846 3050B [2]
Chromium	13.2	1.4	mg/kg	1	03/11/19	03/11/19	GT	SW846 6010D [1]	SW846 3050B [2]
Nickel	11.5	5.6	mg/kg	1	03/11/19	03/11/19	GT	SW846 6010D [1]	SW846 3050B [2]
Thallium	< 1.4	1.4	mg/kg	1	03/11/19	03/11/19	GT	SW846 6010D [1]	SW846 3050B [2]
Vanadium	19.7	7.0	mg/kg	1	03/11/19	03/11/19	GT	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA46280
(2) Prep QC Batch: MP12949

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-I16		
Lab Sample ID:	JC84093-3A	**Date Sampled:**	03/08/19
Matrix:	SO - Soil	**Date Received:**	03/08/19
		Percent Solids:	72.8
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	13.2	2.0	mg/kg	1	03/14/19 17:30	RI	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-E17		
Lab Sample ID:	JC84093-4A	**Date Sampled:**	03/08/19
Matrix:	SO - Soil	**Date Received:**	03/08/19
		Percent Solids:	67.5
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 2.9	2.9	mg/kg	1	03/11/19	03/11/19	GT	SW846 6010D [1]	SW846 3050B [2]
Chromium	15.4	1.5	mg/kg	1	03/11/19	03/11/19	GT	SW846 6010D [1]	SW846 3050B [2]
Nickel	13.3	5.9	mg/kg	1	03/11/19	03/11/19	GT	SW846 6010D [1]	SW846 3050B [2]
Thallium	< 1.5	1.5	mg/kg	1	03/11/19	03/11/19	GT	SW846 6010D [1]	SW846 3050B [2]
Vanadium	21.3	7.3	mg/kg	1	03/11/19	03/11/19	GT	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA46280
(2) Prep QC Batch: MP12949

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-E17		
Lab Sample ID:	JC84093-4A	**Date Sampled:**	03/08/19
Matrix:	SO - Soil	**Date Received:**	03/08/19
		Percent Solids:	67.5
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	15.4	2.1	mg/kg	1	03/14/19 17:27	RI	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

SO
FB

CHAIN OF CUSTODY

SGS North America Inc. - Dayton
2235 Route 130, Dayton, NJ 08810
TEL. 732-329-0200 FAX 732-329-3499
www.sgs.com/ehsusa

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PN

FED-EX Tracking #

Bottle Order Control # AV-12/018-219

SGS Quote #

SGS Job # JC84109

Company Name: Arcadis	Project Name: PPG Jersey City Site 107		
Street Address: 10 Friends Lane	Street: 18 Chapel Ave.	Billing Information (If different from Report to)	
City / State / Zip: Newtown PA 18940	City / State: Jersey City, NJ	Company Name	
Project Contact / E-mail: Matt Bell	Project #: N90007770.3	Street Address	
Phone # / Fax #: 646.752.5629	Client Purchase Order #	City / State / Zip	
Sampler(s) Name(s) / Phone #: Christin Citeli	Project Manager: Jim McLaughlin	Attention:	

Matrix Codes: DW - Drinking Water; GW - Ground Water; WW - Water; SW - Surface Water; SO - Soil; SL- Sludge; SED-Sediment; OI - Oil; LIQ - Other Liquid; AIR - Air; SOL - Other Solid; WP - Wipe; FB-Field Blank; EB-Equipment Blank; RB- Rinse Blank; TB-Trip Blank

Lab Sample #	Field ID / Point of Collection	MEOH/DI Vial #	Collection Date	Collection Time	Sampled by	Matrix	# of bottles	Number of preserved bottles: HCl	NaOH	HNO3	H2SO4	NONE	DI Water	MEOH	ENCORE	Total Chromium	Trivalent Chromium	Hexavalent Chromium	Antimony	Nickel	Thallium	Vanadium	LAB USE ONLY
1	FB(20190308) - A		3/8/19	0830		FB	2			1		1				X	X	X	X	X	X	X	A19
2	SW-A21 (0.0 - 0.5')		3/8/19	0920		SO	1					1				X	X	X	X	X	X	X	M18
3	SW-A21 (2.0 - 2.5')		3/8/19	0930		SO	1					1				X	X	X	X	X	X	X	
4	SW-A20 (0.0 - 0.5')		3/8/19	0945		SO	1					1				X	X	X	X	X	X	X	C93
5	SW-A20 (2.0 - 2.5')		3/8/19	0955		SO	1					1				X	X	X	X	X	X	X	
6	SW-A19 (0.0 - 0.5')		3/8/19	1005		SO	1					1				X	X	X	X	X	X	X	
7	SW-A19 (2.0 - 2.5')		3/8/19	1015		SO	1					1				X	X	X	X	X	X	X	
8	SW-A19 (4.0 - 4.5')		3/8/19	1025		SO	1					1				X	X	X	X	X	X	X	
9	SW-A18 (0.0 - 0.5')		3/8/19	1030		SO	1					1				X	X	X	X	X	X	X	
10	SW-A18 (2.0 - 2.5')		3/8/19	1035		SO	1					1				X	X	X	X	X	X	X	
11	SW-A18 (4.0 - 4.5')		3/8/19	1040		SO	1					1				X	X	X	X	X	X	X	

Turnaround Time (Business days)

- [ ] Std. 10 Business Days
- [ ] 5 Day RUSH
- [ ] 3 Day RUSH
- [x] 2 Day RUSH (FB)
- [ ] 1 Day RUSH
- [ ] other

Emergency & Rush T/A data available via LabLink

Approved by (SGS Project Manager)/Date:

Data Deliverable Information

- [ ] Commercial "A" (Level 1)
- [ ] Commercial "B" (Level 2)
- [ ] FULLT1 (Level 3+4)
- [ ] NJ Reduced
- [ ] Commercial "C"
- [ ] NJ Data of Known Quality Protocol Reporting
- [ ] NYASP Category A
- [ ] NYASP Category B
- [ ] State Forms
- [x] EDD Format EQuIS
- [ ] Other

Commercial "A" = Results Only; Commercial "B" = Results + QC Summary

NJ Reduced = Results + QC Summary + Partial Raw data

Comments / Special Instructions

INITIAL ASESSMENT LL3A

LABEL VERIFICATION

Sample inventory is verified upon receipt in the Laboratory

Sample Custody must be documented below each time samples change possession, including courier delivery.

	Date Time:	Received By:	Relinquished By:	Date Time:	Received By:
1 Relinquished by Sampler:	3/8/19 1410	1 Robert Arcuberis	2 Robert Arcuberis	3/8/19 1700	2
3 Relinquished by Sampler:		3	4		4
5 Relinquished by:		5	Custody Seal # 25082 ☐ Intact ☐ Not intact	Preserved where applicable ☐	On Ice X Cooler Temp 3.3°C

Form:SM088-03C (revised 2/12/18)

http://www.sgs.com/en/terms-and-conditions.

Report of Analysis

Client Sample ID:	SW-A21(0.0-0.5)		
Lab Sample ID:	JC84109-2	**Date Sampled:**	03/08/19
Matrix:	SO - Soil	**Date Received:**	03/08/19
		Percent Solids:	52.1
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
~~Chromium, Hexavalent~~	~~31.0~~	~~0.77~~	~~mg/kg~~	~~1~~	~~03/15/19 13:08~~	~~RI~~	~~SW846 3060A/7196A~~
Redox Potential Vs H2	260		mv	1	03/13/19 20:28	EB	ASTM D1498-76M
Solids, Percent	52.1		%	1	03/10/19 14:00	BG	SM2540 G 18TH ED MOD
pH	7.86 J		su	1	03/13/19 20:12	EB	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A21(2.0-2.5)		
Lab Sample ID:	JC84109-3	**Date Sampled:**	03/08/19
Matrix:	SO - Soil	**Date Received:**	03/08/19
		Percent Solids:	63.5
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
~~Chromium, Hexavalent~~	~~36.4~~	~~0.63~~	~~mg/kg~~	~~1~~	~~03/15/19 13:08~~	~~RI~~	~~SW846 3060A/7196A~~
Redox Potential Vs H2	305		mv	1	03/13/19 20:29	EB	ASTM D1498-76M
Solids, Percent	63.5		%	1	03/10/19 14:00	BG	SM2540 G 18TH ED MOD
pH	8.15 J		su	1	03/13/19 20:17	EB	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A20(0.0-0.5)		
Lab Sample ID:	JC84109-4	**Date Sampled:**	03/08/19
Matrix:	SO - Soil	**Date Received:**	03/08/19
		Percent Solids:	59.9
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
~~Chromium, Hexavalent~~	~~58.5~~	~~0.67~~	~~mg/kg~~	~~1~~	~~03/15/19 13:08~~	~~RI~~	~~SW846 3060A/7196A~~
Redox Potential Vs H2	301		mv	1	03/13/19 21:20	EB	ASTM D1498-76M
Solids, Percent	59.9		%	1	03/10/19 14:00	BG	SM2540 G 18TH ED MOD
pH	8.20 J		su	1	03/13/19 20:20	EB	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A20(2.0-2.5)		
Lab Sample ID:	JC84109-5	**Date Sampled:**	03/08/19
Matrix:	SO - Soil	**Date Received:**	03/08/19
		Percent Solids:	64.4
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
~~Chromium, Hexavalent~~	~~23.2~~	~~0.62~~	~~mg/kg~~	~~1~~	~~03/15/19 13:08~~	~~RI~~	~~SW846 3060A/7196A~~
Redox Potential Vs H2	257		mv	1	03/13/19 21:26	EB	ASTM D1498-76M
Solids, Percent	64.4		%	1	03/10/19 14:00	BG	SM2540 G 18TH ED MOD
pH	9.17 J		su	1	03/13/19 19:20	EB	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A19(0.0-0.5)		
Lab Sample ID:	JC84109-6	**Date Sampled:**	03/08/19
Matrix:	SO - Soil	**Date Received:**	03/08/19
		Percent Solids:	82.4
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
~~Chromium, Hexavalent~~	~~14.2~~	~~0.49~~	~~mg/kg~~	~~1~~	~~03/15/19 13:08~~	~~RI~~	~~SW846 3060A/7196A~~
Redox Potential Vs H2	465		mv	1	03/13/19 22:25	EB	ASTM D1498-76M
Solids, Percent	82.4		%	1	03/10/19 14:00	BG	SM2540 G 18TH ED MOD
pH	7.78 J		su	1	03/13/19 21:35	EB	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A19(2.0-2.5)		
Lab Sample ID:	JC84109-7	**Date Sampled:**	03/08/19
Matrix:	SO - Soil	**Date Received:**	03/08/19
		Percent Solids:	81.7
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
~~Chromium, Hexavalent~~	~~70.3~~	~~2.4~~	~~mg/kg~~	~~5~~	~~03/15/19 13:08~~	~~RI~~	~~SW846 3060A/7196A~~
Redox Potential Vs H2	506		mv	1	03/13/19 22:31	EB	ASTM D1498-76M
Solids, Percent	81.7		%	1	03/10/19 14:00	BG	SM2540 G 18TH ED MOD
pH	7.79 J		su	1	03/13/19 21:40	EB	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A19(4.0-4.5)		
Lab Sample ID:	JC84109-8	**Date Sampled:**	03/08/19
Matrix:	SO - Soil	**Date Received:**	03/08/19
		Percent Solids:	81.1
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
~~Chromium, Hexavalent~~	~~2.9~~	~~0.49~~	~~mg/kg~~	~~1~~	~~03/15/19 13:08~~	~~RI~~	~~SW846 3060A/7196A~~
Redox Potential Vs H2	368		mv	1	03/13/19 22:42	EB	ASTM D1498-76M
Solids, Percent	81.1		%	1	03/10/19 14:00	BG	SM2540 G 18TH ED MOD
pH	7.05 J		su	1	03/13/19 21:45	EB	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A18(0.0-0.5)		
Lab Sample ID:	JC84109-9	**Date Sampled:**	03/08/19
Matrix:	SO - Soil	**Date Received:**	03/08/19
		Percent Solids:	81.6
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
~~Chromium, Hexavalent~~	~~7.2~~	~~0.49~~	~~mg/kg~~	~~1~~	~~03/15/19 13:00~~	~~RI~~	~~SW846 3060A/7196A~~
Redox Potential Vs H2	491		mv	1	03/13/19 22:19	EB	ASTM D1498-76M
Solids, Percent	81.6		%	1	03/10/19 14:00	BG	SM2540 G 18TH ED MOD
pH	7.35 J		su	1	03/13/19 21:20	EB	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A18(2.0-2.5)		
Lab Sample ID:	JC84109-10	**Date Sampled:**	03/08/19
Matrix:	SO - Soil	**Date Received:**	03/08/19
		Percent Solids:	79.2
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
~~Chromium, Hexavalent~~	~~15.3~~	~~0.51~~	~~mg/kg~~	~~1~~	~~03/15/19 13:08~~	~~RI~~	~~SW846 3060A/7196A~~
Redox Potential Vs H2	373		mv	1	03/13/19 22:44	EB	ASTM D1498-76M
Solids, Percent	79.2		%	1	03/10/19 14:00	BG	SM2540 G 18TH ED MOD
pH	7.81 J		su	1	03/13/19 21:51	EB	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A18(4.0-4.5)		
Lab Sample ID:	JC84109-11	**Date Sampled:**	03/08/19
Matrix:	SO - Soil	**Date Received:**	03/08/19
		Percent Solids:	82.9
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
~~Chromium, Hexavalent~~	~~10.6~~	~~0.48~~	~~mg/kg~~	~~1~~	~~03/15/19 13:08~~	~~RI~~	~~SW846 3060A/7196A~~
Redox Potential Vs H2	382		mv	1	03/13/19 22:48	EB	ASTM D1498-76M
Solids, Percent	82.9		%	1	03/10/19 14:00	BG	SM2540 G 18TH ED MOD
pH	7.88 J		su	1	03/13/19 21:54	EB	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A21(0.0-0.5)		
Lab Sample ID:	JC84109-2R	**Date Sampled:**	03/08/19
Matrix:	SO - Soil	**Date Received:**	03/08/19
		Percent Solids:	52.1
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	39.1 J	0.77	mg/kg	1	04/01/19 16:17	RI	SW846 3060A/7196A

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A21(2.0-2.5)		
Lab Sample ID:	JC84109-3R	**Date Sampled:**	03/08/19
Matrix:	SO - Soil	**Date Received:**	03/08/19
		Percent Solids:	63.5
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	34.0 J	0.63	mg/kg	1	04/01/19 16:17	RI	SW846 3060A/7196A

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A20(0.0-0.5)		
Lab Sample ID:	JC84109-4R	**Date Sampled:**	03/08/19
Matrix:	SO - Soil	**Date Received:**	03/08/19
		Percent Solids:	59.9
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	52.3 J	0.67	mg/kg	1	04/01/19 16:17	RI	SW846 3060A/7196A

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A20(2.0-2.5)		
Lab Sample ID:	JC84109-5R	**Date Sampled:**	03/08/19
Matrix:	SO - Soil	**Date Received:**	03/08/19
		Percent Solids:	64.4
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	138 J	3.1	mg/kg	5	04/01/19 16:19	RI	SW846 3060A/7196A

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A19(0.0-0.5)		
Lab Sample ID:	JC84109-6R	**Date Sampled:**	03/08/19
Matrix:	SO - Soil	**Date Received:**	03/08/19
		Percent Solids:	82.4
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	24.6 J	0.49	mg/kg	1	04/01/19 16:17	RI	SW846 3060A/7196A

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A19(2.0-2.5)		
Lab Sample ID:	JC84109-7R	**Date Sampled:**	03/08/19
Matrix:	SO - Soil	**Date Received:**	03/08/19
		Percent Solids:	81.7
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	102 J	2.4	mg/kg	5	04/01/19 16:19	RI	SW846 3060A/7196A

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A19(4.0-4.5)		
Lab Sample ID:	JC84109-8R	**Date Sampled:**	03/08/19
Matrix:	SO - Soil	**Date Received:**	03/08/19
		Percent Solids:	81.1
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	3.9 J	0.49	mg/kg	1	04/01/19 16:17	RI	SW846 3060A/7196A

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A18(0.0-0.5)		
Lab Sample ID:	JC84109-9R	**Date Sampled:**	03/08/19
Matrix:	SO - Soil	**Date Received:**	03/08/19
		Percent Solids:	81.6
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	11.0 J	0.49	mg/kg	1	04/01/19 16:07	RI	SW846 3060A/7196A

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A18(2.0-2.5)		
Lab Sample ID:	JC84109-10R	**Date Sampled:**	03/08/19
Matrix:	SO - Soil	**Date Received:**	03/08/19
		Percent Solids:	79.2
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	25.9 J	0.51	mg/kg	1	04/01/19 16:17	RI	SW846 3060A/7196A

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A18(4.0-4.5)		
Lab Sample ID:	JC84109-11R	**Date Sampled:**	03/08/19
Matrix:	SO - Soil	**Date Received:**	03/08/19
		Percent Solids:	82.9
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	6.8 J	0.48	mg/kg	1	04/01/19 16:17	RI	SW846 3060A/7196A

RL = Reporting Limit

Report of Analysis

Client Sample ID: FB(20190308)-A
Lab Sample ID: JC84109-1A
Matrix: AQ - Field Blank Soil
Project: PPG Site 107, 18 Chapel Avenue, Jersey City, NJ

Date Sampled: 03/08/19
Date Received: 03/08/19
Percent Solids: n/a

Total Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 6.0	6.0	ug/l	1	03/11/19	03/11/19	ND	SW846 6010D [1]	SW846 3010A [2]
Chromium	< 10	10	ug/l	1	03/11/19	03/11/19	ND	SW846 6010D [1]	SW846 3010A [2]
Nickel	< 10	10	ug/l	1	03/11/19	03/11/19	ND	SW846 6010D [1]	SW846 3010A [2]
Thallium	< 10	10	ug/l	1	03/11/19	03/11/19	ND	SW846 6010D [1]	SW846 3010A [2]
Vanadium	< 50	50	ug/l	1	03/11/19	03/11/19	ND	SW846 6010D [1]	SW846 3010A [2]

(1) Instrument QC Batch: MA46281
(2) Prep QC Batch: MP12984

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A21(0.0-0.5)		
Lab Sample ID:	JC84109-2A	**Date Sampled:**	03/08/19
Matrix:	SO - Soil	**Date Received:**	03/08/19
		Percent Solids:	52.1
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony [a]	< 12	12	mg/kg	3	03/11/19	03/11/19	GT	SW846 6010D [1]	SW846 3050B [2]
Chromium	2400	5.9	mg/kg	3	03/11/19	03/11/19	GT	SW846 6010D [1]	SW846 3050B [2]
Nickel	454	7.9	mg/kg	1	03/11/19	03/11/19	GT	SW846 6010D [1]	SW846 3050B [2]
Thallium [a]	< 5.9	5.9	mg/kg	3	03/11/19	03/11/19	GT	SW846 6010D [1]	SW846 3050B [2]
Vanadium [a]	802	30	mg/kg	3	03/11/19	03/11/19	GT	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA46280
(2) Prep QC Batch: MP12949

(a) Elevated detection limit due to dilution required for high interfering element.

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A21(0.0-0.5)		
Lab Sample ID:	JC84109-2A	**Date Sampled:**	03/08/19
Matrix:	SO - Soil	**Date Received:**	03/08/19
		Percent Solids:	52.1
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	~~2370~~ 2360	6.7	mg/kg	1	03/15/19 13:08	RI	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A21(2.0-2.5)		
Lab Sample ID:	JC84109-3A	**Date Sampled:**	03/08/19
Matrix:	SO - Soil	**Date Received:**	03/08/19
		Percent Solids:	63.5
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony [a]	< 6.1	6.1	mg/kg	2	03/11/19	03/11/19	GT	SW846 6010D [1]	SW846 3050B [2]
Chromium [a]	1020	3.1	mg/kg	2	03/11/19	03/11/19	GT	SW846 6010D [1]	SW846 3050B [2]
Nickel	170	6.1	mg/kg	1	03/11/19	03/11/19	GT	SW846 6010D [1]	SW846 3050B [2]
Thallium [a]	< 3.1	3.1	mg/kg	2	03/11/19	03/11/19	GT	SW846 6010D [1]	SW846 3050B [2]
Vanadium	283	7.6	mg/kg	1	03/11/19	03/11/19	GT	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA46280
(2) Prep QC Batch: MP12949

(a) Elevated detection limit due to dilution required for high interfering element.

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A21(2.0-2.5)		
Lab Sample ID:	JC84109-3A	**Date Sampled:**	03/08/19
Matrix:	SO - Soil	**Date Received:**	03/08/19
		Percent Solids:	63.5
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	~~984~~ 986	3.7	mg/kg	1	03/15/19 13:08	RI	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A20(0.0-0.5)		
Lab Sample ID:	JC84109-4A	**Date Sampled:**	03/08/19
Matrix:	SO - Soil	**Date Received:**	03/08/19
		Percent Solids:	59.9
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony [a]	< 9.8	9.8	mg/kg	3	03/11/19	03/11/19	GT	SW846 6010D [1]	SW846 3050B [2]
Chromium	1730	4.9	mg/kg	3	03/11/19	03/11/19	GT	SW846 6010D [1]	SW846 3050B [2]
Nickel	404	6.5	mg/kg	1	03/11/19	03/11/19	GT	SW846 6010D [1]	SW846 3050B [2]
Thallium [a]	< 4.9	4.9	mg/kg	3	03/11/19	03/11/19	GT	SW846 6010D [1]	SW846 3050B [2]
Vanadium [a]	778	25	mg/kg	3	03/11/19	03/11/19	GT	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA46280
(2) Prep QC Batch: MP12949

(a) Elevated detection limit due to dilution required for high interfering element.

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A20(0.0-0.5)		
Lab Sample ID:	JC84109-4A	**Date Sampled:**	03/08/19
Matrix:	SO - Soil	**Date Received:**	03/08/19
		Percent Solids:	59.9
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	~~1670~~ 1680	5.6	mg/kg	1	03/15/19 13:08	RI	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A20(2.0-2.5)		
Lab Sample ID:	JC84109-5A	**Date Sampled:**	03/08/19
Matrix:	SO - Soil	**Date Received:**	03/08/19
		Percent Solids:	64.4
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony [a]	< 15	15	mg/kg	5	03/11/19	03/11/19	GT	SW846 6010D [1]	SW846 3050B [2]
Chromium	3540	7.7	mg/kg	5	03/11/19	03/11/19	GT	SW846 6010D [1]	SW846 3050B [2]
Nickel	513	6.1	mg/kg	1	03/11/19	03/11/19	GT	SW846 6010D [1]	SW846 3050B [2]
Thallium [a]	< 7.7	7.7	mg/kg	5	03/11/19	03/11/19	GT	SW846 6010D [1]	SW846 3050B [2]
Vanadium [a]	884	38	mg/kg	5	03/11/19	03/11/19	GT	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA46280
(2) Prep QC Batch: MP12949

(a) Elevated detection limit due to dilution required for high interfering element.

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A20(2.0-2.5)		
Lab Sample ID:	JC84109-5A	**Date Sampled:**	03/08/19
Matrix:	SO - Soil	**Date Received:**	03/08/19
		Percent Solids:	64.4
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	~~3520~~ 3400	8.3	mg/kg	1	03/15/19 13:08	RI	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A19(0.0-0.5)		
Lab Sample ID:	JC84109-6A	**Date Sampled:**	03/08/19
Matrix:	SO - Soil	**Date Received:**	03/08/19
		Percent Solids:	82.4
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony [a]	< 4.9	4.9	mg/kg	2	03/11/19	03/11/19	GT	SW846 6010D [1]	SW846 3050B [2]
Chromium [a]	815	2.4	mg/kg	2	03/11/19	03/11/19	GT	SW846 6010D [1]	SW846 3050B [2]
Nickel	90.6	4.9	mg/kg	1	03/11/19	03/11/19	GT	SW846 6010D [1]	SW846 3050B [2]
Thallium [a]	< 2.4	2.4	mg/kg	2	03/11/19	03/11/19	GT	SW846 6010D [1]	SW846 3050B [2]
Vanadium	150	6.1	mg/kg	1	03/11/19	03/11/19	GT	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA46280
(2) Prep QC Batch: MP12949

(a) Elevated detection limit due to dilution required for high interfering element.

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A19(0.0-0.5)		
Lab Sample ID:	JC84109-6A	**Date Sampled:**	03/08/19
Matrix:	SO - Soil	**Date Received:**	03/08/19
		Percent Solids:	82.4
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	~~801~~ 790	2.9	mg/kg	1	03/15/19 13:08	RI	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A19(2.0-2.5)		
Lab Sample ID:	JC84109-7A	**Date Sampled:**	03/08/19
Matrix:	SO - Soil	**Date Received:**	03/08/19
		Percent Solids:	81.7
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony [a]	< 7.2	7.2	mg/kg	3	03/11/19	03/11/19	GT	SW846 6010D [1]	SW846 3050B [2]
Chromium	1740	3.6	mg/kg	3	03/11/19	03/11/19	GT	SW846 6010D [1]	SW846 3050B [2]
Nickel	139	4.8	mg/kg	1	03/11/19	03/11/19	GT	SW846 6010D [1]	SW846 3050B [2]
Thallium [a]	< 3.6	3.6	mg/kg	3	03/11/19	03/11/19	GT	SW846 6010D [1]	SW846 3050B [2]
Vanadium [a]	231	18	mg/kg	3	03/11/19	03/11/19	GT	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA46280
(2) Prep QC Batch: MP12949

(a) Elevated detection limit due to dilution required for high interfering element.

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A19(2.0-2.5)		
Lab Sample ID:	JC84109-7A	**Date Sampled:**	03/08/19
Matrix:	SO - Soil	**Date Received:**	03/08/19
		Percent Solids:	81.7
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	~~1670~~ 1640	6.0	mg/kg	1	03/15/19 13:08	RI	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A19(4.0-4.5)		
Lab Sample ID:	JC84109-8A	**Date Sampled:**	03/08/19
Matrix:	SO - Soil	**Date Received:**	03/08/19
		Percent Solids:	81.1
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 2.4	2.4	mg/kg	1	03/11/19	03/11/19	GT	SW846 6010D [1]	SW846 3050B [2]
Chromium	53.7	1.2	mg/kg	1	03/11/19	03/11/19	GT	SW846 6010D [1]	SW846 3050B [2]
Nickel	13.6	4.8	mg/kg	1	03/11/19	03/11/19	GT	SW846 6010D [1]	SW846 3050B [2]
Thallium	< 1.2	1.2	mg/kg	1	03/11/19	03/11/19	GT	SW846 6010D [1]	SW846 3050B [2]
Vanadium	20.6	6.0	mg/kg	1	03/11/19	03/11/19	GT	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA46280
(2) Prep QC Batch: MP12949

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A19(4.0-4.5)		
Lab Sample ID:	JC84109-8A	**Date Sampled:**	03/08/19
Matrix:	SO - Soil	**Date Received:**	03/08/19
		Percent Solids:	81.1
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	~~50.8~~ 49.8	1.7	mg/kg	1	03/15/19 13:08	RI	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A18(0.0-0.5)		
Lab Sample ID:	JC84109-9A	**Date Sampled:**	03/08/19
Matrix:	SO - Soil	**Date Received:**	03/08/19
		Percent Solids:	81.6
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 2.5	2.5	mg/kg	1	03/11/19	03/11/19	GT	SW846 6010D [1]	SW846 3050B [2]
Chromium	296	1.3	mg/kg	1	03/11/19	03/11/19	GT	SW846 6010D [1]	SW846 3050B [2]
Nickel	36.8	5.1	mg/kg	1	03/11/19	03/11/19	GT	SW846 6010D [1]	SW846 3050B [2]
Thallium	< 1.3	1.3	mg/kg	1	03/11/19	03/11/19	GT	SW846 6010D [1]	SW846 3050B [2]
Vanadium	58.9	6.3	mg/kg	1	03/11/19	03/11/19	GT	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA46280
(2) Prep QC Batch: MP12949

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A18(0.0-0.5)		
Lab Sample ID:	JC84109-9A	**Date Sampled:**	03/08/19
Matrix:	SO - Soil	**Date Received:**	03/08/19
		Percent Solids:	81.6
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	~~289~~ 285	1.8	mg/kg	1	03/15/19 13:00	RI	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A18(2.0-2.5)		
Lab Sample ID:	JC84109-10A	**Date Sampled:**	03/08/19
Matrix:	SO - Soil	**Date Received:**	03/08/19
		Percent Solids:	79.2
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 2.6	2.6	mg/kg	1	03/11/19	03/11/19	GT	SW846 6010D [1]	SW846 3050B [3]
Chromium	299	1.3	mg/kg	1	03/11/19	03/11/19	GT	SW846 6010D [1]	SW846 3050B [3]
Nickel	31.8	5.2	mg/kg	1	03/11/19	03/11/19	GT	SW846 6010D [1]	SW846 3050B [3]
Thallium [a]	< 2.6	2.6	mg/kg	2	03/11/19	03/12/19	ND	SW846 6010D [2]	SW846 3050B [3]
Vanadium	34.3	6.4	mg/kg	1	03/11/19	03/11/19	GT	SW846 6010D [1]	SW846 3050B [3]

(1) Instrument QC Batch: MA46280
(2) Instrument QC Batch: MA46287
(3) Prep QC Batch: MP12949

(a) Elevated detection limit due to dilution required for high interfering element.

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A18(2.0-2.5)		
Lab Sample ID:	JC84109-10A	**Date Sampled:**	03/08/19
Matrix:	SO - Soil	**Date Received:**	03/08/19
		Percent Solids:	79.2
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	~~284~~ 273	1.8	mg/kg	1	03/15/19 13:08	RI	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A18(4.0-4.5)		
Lab Sample ID:	JC84109-11A	**Date Sampled:**	03/08/19
Matrix:	SO - Soil	**Date Received:**	03/08/19
		Percent Solids:	82.9
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 2.3	2.3	mg/kg	1	03/11/19	03/11/19	GT	SW846 6010D [1]	SW846 3050B [2]
Chromium	103	1.2	mg/kg	1	03/11/19	03/11/19	GT	SW846 6010D [1]	SW846 3050B [2]
Nickel	16.1	4.6	mg/kg	1	03/11/19	03/11/19	GT	SW846 6010D [1]	SW846 3050B [2]
Thallium	< 1.2	1.2	mg/kg	1	03/11/19	03/11/19	GT	SW846 6010D [1]	SW846 3050B [2]
Vanadium	28.3	5.8	mg/kg	1	03/11/19	03/11/19	GT	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA46280
(2) Prep QC Batch: MP12949

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A18(4.0-4.5)		
Lab Sample ID:	JC84109-11A	**Date Sampled:**	03/08/19
Matrix:	SO - Soil	**Date Received:**	03/08/19
		Percent Solids:	82.9
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	~~92.4~~ 96.2	1.7	mg/kg	1	03/15/19 13:08	RI	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

ARCADIS Design & Consultancy for natural and built assets

PPG Industries

DATA QUALITY ASSESSMENT

Site 107 Fashionland

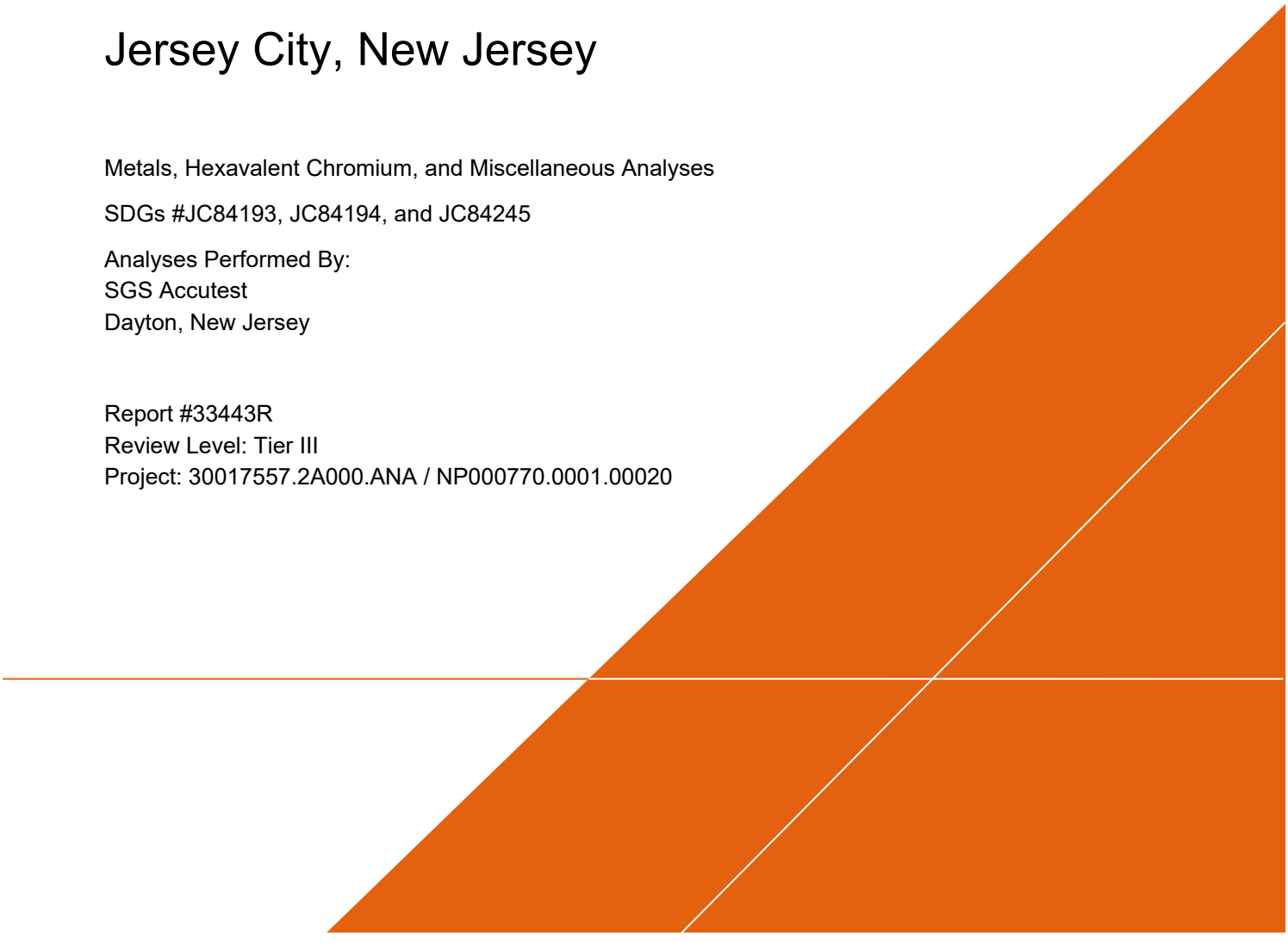
Jersey City, New Jersey

Metals, Hexavalent Chromium, and Miscellaneous Analyses

SDGs #JC84193, JC84194, and JC84245

Analyses Performed By:
SGS Accutest
Dayton, New Jersey

Report #33443R
Review Level: Tier III
Project: 30017557.2A000.ANA / NP000770.0001.00020



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Groups (SDGs) # JC84193, JC84194, and JC84245 for samples collected in association with the PPG Industries Site 107 Fashionland, Jersey City, New Jersey Site. The review was conducted as a Tier III evaluation and included review of data package completeness. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

SDG	Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis		
						Cr VI	MET	MISC
JC84193	FB(20190311)	JC84193-1	Water	3/11/2019		X	X	X
	BS-D17A	JC84193-2	Soil	3/11/2019		X	X	X
JC84194	FB(20190311)-A	JC84194-1	Water	3/11/2019		X	X	X
	BS-B1	JC84194-2	Soil	3/11/2019		X	X	X
JC84245	FB(20190312)-A	JC84245-1	Water	3/12/2019		X	X	X
	SW-A30(0.0-0.5)	JC84245-2	Soil	3/12/2019		X	X	X
	SW-A30(2.0-2.5)	JC84245-3	Soil	3/12/2019		X	X	X
	SW-A30(4.0-4.5)	JC84245-4	Soil	3/12/2019		X	X	X
	SW-A30(6.0-6.5)	JC84245-5	Soil	3/12/2019		X	X	X
	SW-A30(8.0-8.5)	JC84245-6	Soil	3/12/2019		X	X	X
	SW-A31(0.0-0.5)	JC84245-7	Soil	3/12/2019		X	X	X
	SW-A31(2.0-2.5)	JC84245-8	Soil	3/12/2019		X	X	X
	SW-A32(0.0-0.5)	JC84245-9	Soil	3/12/2019		X	X	X
	SW-A32(2.0-2.5)	JC84245-10	Soil	3/12/2019		X	X	X
	SW-A33(0.0-0.5)	JC84245-11	Soil	3/12/2019		X	X	X
	108_CONC-B1	JC84245-14	Soil	3/12/2019		X	X	X

Notes:

1. Metals include antimony, chromium, nickel, thallium, and vanadium. Trivalent chromium is reported by calculation (Chromium) – (Hexavalent Chromium).
2. Cr VI is hexavalent chromium.
3. Miscellaneous parameters include pH and redox potential.
4. SDG #JC84193: Miscellaneous parameters for sample BS-D17A also include ferrous iron, sulfide screen, and total organic carbon (TOC).

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of QA or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

Note:
QA - Quality Assurance

INORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Methods 6010C, 7196A, and 9045D; Standard Methods (SM) 4500H+B and SM4500S2-A; Lloyd Kahn; and ASTM D1498-76 and D3872-86. Data were reviewed in accordance with USEPA Region 2 SOP HW-2b, Revision 15 (December 2012); New Jersey Division of Remediation Management and Response Standard Operating Procedure for Analytical Data Validation of Hexavalent Chromium (September 2009); New Jersey Department of Environmental Protection Data Quality Assessment and Data Usability Evaluation Technical Guidance (April 2014); Field Sampling Plan/Quality Assurance Project Plan, PPG Non-Residential and Residential Chromium Sites, Hudson County, New Jersey (AECOM, June 2010); and Arcadis Quality Assurance Project Plan – Addendum, Site 107 Fashionland, Jersey City, New Jersey (Arcadis, June 2018).

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and that it was already subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with the USEPA National Functional Guidelines:

- Concentration (C) Qualifiers
  - U The analyte was analyzed for but not detected. The associated value is the analyte instrument detection limit.
  - B The reported value was obtained from a reading less than the reporting limit (RL), but greater than or equal to the method detection limit (MDL).
- Quantitation (Q) Qualifiers
  - E The reported value is estimated due to the presence of interference.
  - N Spiked sample recovery is not within control limits.
  - * Duplicate analysis is not within control limits.
- Validation Qualifiers
  - J The analyte was positively identified; however, the associated numerical value is an estimated concentration only.
  - J+ The result is an estimated quantity, but the result may be biased high.
  - J- The result is an estimated quantity, but the result may be biased low.
  - UJ The analyte was not detected above the reporting limit. However, the reported limit is approximate and may or may not represent the actual limit of detection.
  - UB Analyte considered non-detect at the listed value due to associated blank contamination.
  - R The data are unusable. The sample results are rejected due to serious deficiencies in meeting Quality Control (QC) critieria. The analyte may or may not be present in the sample.

Two facts should be noted by all data users. First, the “R” flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. “R” values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

METALS ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 6010C	Water	180 days from collection to analysis	Preserved to a pH of less than 2; Cool to <6°C
	Soil	180 days from collection to analysis	Cool to <6°C

All samples were analyzed within the specified holding times.

2. Blank Contamination

Quality assurance (QA) blanks (i.e., method and rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank is calculated for QA blanks containing concentrations greater than the method detection limit (MDL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Analytes were not detected above the MDL in the associated blanks; therefore, detected sample results were not associated with blank contamination.

3. Calibration

Satisfactory instrument calibration is established to provide that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument's continuing performance is satisfactory.

3.1 Initial Calibration and Continuing Calibration

The correct number and type of standards were analyzed. The correlation coefficient of the initial calibration was greater than 0.998 and all initial calibration verification standard and continuing calibration verification standard recoveries were within control limits of 90% to 110%.

All continuing calibration verification standard recoveries were within the control limit.

3.2 Low-Level Calibration Verification

The low-level initial and continuing calibration check standard serves to verify the linearity of calibration of the analysis at the reporting limit.

All RL standard recoveries were within control limits of 70% to 130% (50% to 150% for antimony and thallium).

3.3 ICP Interference Control Sample (ICS)

The ICS verifies the laboratories interelement and background correction factors.

All ICS exhibited recoveries within the control limits of 80% to 120%.

4. Matrix Spike/Matrix Spike Duplicate (MS/MSD)/Laboratory Duplicate Analysis

MS/MSD and laboratory duplicate data are used to assess the precision and accuracy of the analytical method.

4.1 MS/MSD Analysis

All metal analytes must exhibit a percent recovery within the established acceptance limits of 75% to 125%. The MS/MSD recovery control limits do not apply for MS/MSD performed on sample locations where the analyte's concentration detected in the parent sample exceeds the MS/MSD concentration by a factor of four or greater.

The MS/MSD analysis was not performed using a sample from these SDGs.

4.2 Laboratory Duplicate Analysis

The laboratory duplicate relative percent difference (RPD) criterion is applied when parent and duplicate sample concentrations are greater than or equal to 5 times the RL. A control limit of 20% for water matrices and 35% for soil matrices is applied when the criteria above is true. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of ± the RL is applied.

The laboratory duplicate analysis was not performed using a sample from these SDGs.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 50% for soil matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of three times the RL is applied for soil matrices.

A field duplicate sample was not collected in association with these SDGs.

6. Laboratory Control Sample (LCS) Analysis

The LCS analysis is used to assess the accuracy of the analytical method independent of matrix interferences. The analytes associated with the LCS analysis must exhibit a percent recovery between the control limits of 80% and 120%.

The LCS analysis exhibited recoveries and RPDs within the control limits.

7. Serial Dilution

The serial dilution analysis is used to assess if a significant physical or chemical interference exists due to sample matrix. Analytes exhibiting concentrations greater than 10 times the RL in the undiluted sample are evaluated to determine if matrix interference exists. These analytes are required to have less than a

10% difference (%D) between sample results from the undiluted (parent) sample and results associated with the same sample analyzed with a five-fold dilution.

The serial dilution analysis was not performed using a sample from these SDGs.

8. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR METALS

METALS: SW-846 6010C	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Inductively Coupled Plasma-Atomic Emission Spectrometry (ICP-AES)					
Tier II Validation					
Holding Times		X		X	
Reporting limits (units)		X		X	
Blanks					
A. Instrument Blanks		X		X	
B. Method Blanks		X		X	
C. Equipment/Field Blanks		X		X	
Laboratory Control Sample (LCS)		X		X	
Laboratory Control Sample Duplicate (LCSD)	X				X
LCS/LCSD Precision (RPD)	X				X
Matrix Spike (MS) %R	X				X
Matrix Spike Duplicate (MSD) %R	X				X
MS/MSD Precision (RPD)	X				X
Field/Lab Duplicate (RPD)	X				X
ICP Serial Dilution %D	X				X
Total vs. Dissolved	X				X
Reporting Limit Verification		X		X	
Tier III Validation					
Initial Calibration Verification		X		X	
Continuing Calibration Verification		X		X	
CRDL Standard Recovery		X		X	
ICP Interference Check		X		X	
ICP-MS Internal Standards	X				X
Transcription/calculations acceptable		X		X	
Raw Data	X				X
Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%R Percent recovery

RPD Relative percent difference

%D Percent difference

HEXAVALENT CHROMIUM ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 7196A	Water	24 hours from collection to analysis	Cool to <6°C
SW-846 3060A/ 7196A	Soil	30 days from collection to extraction; 7 days from extraction to analysis	Cool to <6°C

All samples were analyzed within the specified holding times.

2. Blank Contamination

Quality assurance (QA) blanks (i.e., method and rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank is calculated for QA blanks containing concentrations greater than the method detection limit (MDL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Analytes were not detected above the MDL in the associated blanks; therefore, detected sample results were not associated with blank contamination.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

The correct number and type of standards were analyzed. The correlation coefficient of the initial calibration was greater than 0.995 and all calibration verification standard recoveries were within control limits of 90% to 110%.

4. Matrix Spike (MS)/Post-Digestion Spike (PDS)/Laboratory Duplicate Analysis

MS, PDS, and laboratory duplicate data are used to assess the precision and accuracy of the analytical method.

4.1 MS Analysis

Soluble and insoluble spike sample analyses are designed to provide information about the effect of the sample matrix on the digestion and measurement methodology. The insoluble spike is used to evaluate the dissolution during the digestion process. Hexavalent chromium must exhibit a percent recovery within

the established acceptance limits of 75% to 125% in both the soluble and insoluble spiked analyses. The control limits do not apply when the parent sample concentration exceeds the spike amount by a factor of four or greater.

SDGs #JC84194 and JC84245: The MS analysis performed on sample locations BS-B1 and SW-A30(0.0-0.5) in association with the insoluble and soluble hexavalent chromium analysis exhibited recoveries within the control limits.

SDG #JC84193: The MS analysis performed on sample location BS-D17A exhibited spike recoveries less than the lower control limits as presented in the table below.

Sample Location	Analyte	Initial Spike Recovery	Reanalysis Spike Recovery
BS-D17A	Hexavalent Chromium, Insoluble	59.3%	< 50%
	Hexavalent Chromium, Soluble	< 50%	< 50%

The criteria used to evaluate spike recoveries are presented in the following table. The qualifications are applied to all sample results associated with the sample preparation batch. In the event of a recovery outside of the control limits, the MS must be reanalyzed.

Control limit	Sample Result	Qualification[1]
Spike recovery ≥ 50% but < 75%	Non-detect	UJ-
	Detect	J-
Spike recovery < 50%	Non-detect	R
	Detect	R
Spike recovery > 125%	Non-detect	No Action
Spike recovery > 125% but ≤ 150%	Detect	J+
Spike recovery > 150%	Detect	R

Notes:

[1] If recoveries are < 50% or > 150% for both insoluble and soluble spikes, associated data will be rejected ("R"); otherwise qualify associated data if one of the spikes is outside the < 50% or > 150% limits.

SDG #JC84193: The original analyses of the field samples are usable with appropriate qualification. No sample results were rejected.

4.2 Post-Digestion Spike (PDS) Analysis

The PDS analysis is designed to verify that neither a reducing condition nor a chemical interference is affecting the analysis. This is accomplished by analyzing a second aliquot of the pH-adjusted filtrate that has been spiked with hexavalent chromium. The PDS must exhibit a percent recovery within the method acceptance limits of 85% to 115%.

SDGs #JC84194 and JC84245: The PDS analysis performed on sample locations BS-B1 and SW-A30(0.0-0.5) exhibited recoveries within the control limits.

SDG #JC84193: The PDS analysis performed on sample location BS-D17A exhibited a recovery outside of the control limits as presented in the table below.

Sample Location	Analyte	PDS Recovery	Reanalysis PDS Recovery
BS-D17A	Hexavalent Chromium	< 85%	< 85%

Since all the samples are from the same site, it is assumed the matrix interference exists for all samples in a reducing environment. It was noted from the Eh pH results that soil samples are in a reducing environment and don't support the presence of hexavalent chromium.

The criteria used to evaluate spike recoveries are presented in the following table. The qualifications are applied to all sample results associated with the sample preparation batch.

Control limit	Sample Result	Qualification
PDS recovery < 85%	Non-detect	UJ-
	Detect	J-
PDS recovery > 115%	Non-detect	No Action
PDS recovery > 115%	Detect	J+

4.3 Laboratory Duplicate Analysis

The laboratory duplicate relative percent difference (RPD) criterion is applied when parent and duplicate sample concentrations are greater than or equal to four times the RL. A control limit of 20% is applied when the criteria above is true. In the instance when the parent and/or duplicate sample concentrations are less than or equal to four times the RL, a control limit of ± the RL is used.

SDG #JC84193: The laboratory duplicate analysis performed on sample location BS-D17A exhibited results within the control limit.

SDGs #JC84194 and JC84245: All analytes associated with laboratory duplicate were within the control limit, with the exception of the analytes presented in the following table.

Sample Location	Analytes	Laboratory Duplicate RPD
BS-B1	Hexavalent Chromium	104%
SW-A30(0.0-0.5)	Hexavalent Chromium	55.8%

The criteria used to evaluate laboratory duplicate RPD are presented in the following table. In the case of a laboratory duplicate RPD deviation, the sample results are qualified. The qualifications are applied to all sample results associated with the sample preparation batch.

Sample Concentration	Control Limit	Sample Result	Qualification
Parent sample and/or laboratory duplicate sample result > four times the RL	> 20%	Non-detect	UJ
		Detect	J
Parent sample and/or laboratory duplicate sample result < four times the RL	± RL	Non-detect	UJ
		Detect	J

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 50% for soil matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of three times the RL is applied for soil matrices.

A field duplicate sample was not collected in association with these SDGs.

6. Laboratory Control Sample (LCS) Analysis

The LCS analysis is used to assess the precision and accuracy of the analytical method independent of matrix interferences. The analytes associated with the LCS analysis must exhibit a percent recovery between the control limits of 80% and 120%.

The LCS analysis exhibited recoveries within the control limits.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR HEXAVALENT CHROMIUM

HEXAVALENT CHROMIUM: SW-846 7196A	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Spectrophotometer					
Tier II Validation					
Holding Times		X		X	
Reporting limits (units)		X		X	
Blanks					
A. Instrument Blanks		X		X	
B. Method Blanks		X		X	
C. Equipment/Field Blanks		X		X	
Laboratory Control Sample (LCS)		X		X	
Matrix Spike (MS) %R		X	X		
Matrix Spike Duplicate (MSD) %R	X				X
MS/MSD Precision (RPD)	X				X
Post Digestion Spike %R		X	X		
Field/Lab Duplicate (RPD)		X	X		
Dilution Factor		X		X	
Tier III Validation					
Initial calibration %RSD or correlation coefficient		X		X	
Continuing calibration %R		X		X	
Raw Data		X		X	
Transcription/calculation errors present		X		X	
Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%R Percent recovery

RPD Relative percent difference

%RSD Relative percent deviation

GENERAL CHEMISTRY ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
pH by SM4500H+B	Water	QAPP: 24 hours of receipt at laboratory	Cool to <6°C
pH by SW846 9045D	Soil	QAPP: 24 hours of receipt at laboratory	Cool to <6°C
Oxidation-Reduction Potential by ASTM D1498-76	Water	Not applicable	Cool to <6°C
Oxidation-Reduction Potential (Redox) by ASTM D1498-76	Soil	Measure immediately after creating leachate	Cool to <6°C
Ferrous Iron by ASTM D3872-86	Soil	24 hours from collection to analysis	Cool to <6°C
Sulfide Screen by SM4500S2-A	Soil	7 days from collection to analysis	Cool to <6°C
Total Organic Carbon (TOC) by Lloyd Kahn	Soil	14 days from collection to analysis	Cool to <6°C

The analyses that exceeded the holding are presented in the following table.

Sample Locations	Method	Holding Time	Criteria
FB(20190311)-A	SM4500H+B	Analysis: 28 hours	< 24 hours of receipt by laboratory
BS-D17A BS-B1	SW846 9045D	Analysis: 6 days	< 24 hours of receipt by laboratory
SW-A30(0.0-0.5) SW-A30(2.0-2.5) SW-A30(4.0-4.5) SW-A30(6.0-6.5) SW-A30(8.0-8.5) SW-A31(0.0-0.5)		Analysis: 7 days	
SW-A31(2.0-2.5) SW-A32(0.0-0.5) SW-A32(2.0-2.5) SW-A33(0.0-0.5) 108_CONC-B1		Analysis: 8 days	
BS-D17A	ASTM D3872-86	Analysis: 35 days	< 24 hours from collection
BS-D17A	SM4500S2-A	Analysis: 35 days	< 7 days from collection
BS-D17A	Lloyd Kahn	Analysis: 29 days	< 14 days from collection

Sample results were qualified as specified in the table below. All other holding times were met.

Criteria	Qualification	
	Detected Analytes	Non-detect Analytes
Analysis completed less than two times holding time	J	UJ
Analysis completed greater than two times holding time	J	R

2. Blank Contamination

Quality assurance (QA) blanks (i.e., method and rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank is calculated for QA blanks containing concentrations greater than the method detection limit (MDL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Method blank analysis is not applicable for Redox and pH analyses.

Ferrous iron, sulfide, and TOC were not detected above the MDL in the associated blanks; therefore, detected sample results were not associated with blank contamination.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

The correct number and type of standards were analyzed. All buffer check results were within acceptance limits.

4. Laboratory Duplicate Analysis

Laboratory duplicate data are used to assess the precision of the analytical method. The laboratory duplicate relative percent difference (RPD) criterion is applied when parent and duplicate sample concentrations are greater than or equal to 5 times the RL. A control limit of 20% for water matrices and 35% for soil matrices is applied when the criteria above is true. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of ± the RL is applied.

SDGs #JC84193 and JC84194: The laboratory duplicate analysis was not performed using a sample from these SDGs.

SDG #JC84245: The laboratory duplicate analysis performed on sample location SW-A32(0.0-0.5) exhibited results within the control limit.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 50% for soil matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of three times the RL is applied for soil matrices.

A field duplicate sample was not collected in association with these SDGs.

6. Laboratory Control Sample (LCS) Analysis

The LCS analysis is used to assess the precision and accuracy of the analytical method independent of matrix interferences. The analytes associated with the LCS analysis must exhibit a percent recovery between the control limits of 80% and 120%.

LCS results for redox potential, pH, and sulfide screen were not reported in the analytical report.

The LCS analysis performed in association with ferrous iron and TOC exhibited recoveries within the control limits.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR GENERAL CHEMISTRY

General Chemistry: SM4500H+B, SW846 9045D, ASTM D1498-76	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Miscellaneous Instrumentation					
Tier II Validation					
Holding times		X	X		
Reporting limits (units)		X		X	
Blanks					
A. Instrument Blanks		X		X	
B. Method blanks		X		X	
C. Equipment blanks		X		X	
Laboratory Control Sample (LCS) %R		X		X	
Laboratory Control Sample Duplicate (LCSD) %R	X				X
LCS/LCSD Precision (RPD)	X				X
Matrix Spike (MS) %R	X				X
Matrix Spike Duplicate (MSD) %R	X				X
MS/MSD Precision (RPD)	X				X
Field/Lab Duplicate (RPD)		X		X	
Dilution Factor		X		X	
Tier III Validation					
Initial calibration %RSD or correlation coefficient	X				X
Continuing calibration %R	X				X
Raw Data		X		X	
Transcription/calculation errors present		X		X	
Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%R Percent recovery

RPD Relative percent difference

VALIDATION PERFORMED BY: Jennifer Singer

SIGNATURE: 

DATE: July 15, 2019

PEER REVIEW: Dennis Capria

DATE: July 18, 2019

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

SO
FB

E

CHAIN OF CUSTODY

SGS North America Inc. - Dayton
2235 Route 130, Dayton, NJ 08810
TEL. 732-329-0200 FAX: 732-329-3499/3480
www.sgs.com/ehsusa

Page 1 of 1

FED-EX Tracking #:
Bottle Order Control #: AK-121018-206
SGS Quote #:
SGS Job #: JC84193

Client / Reporting Information

Company Name: Arcadis
Street Address: 10 Friends Lane, Suite 100
City / State / Zip: Newtown PA 18940
Project Contact / E-mail: Matthew Bell
Phone #: 610-755-7080
Sampler(s) Name(s): C. Cetelli
Phone #:

Project Information

Project Name: PPG Site 107 (Jersey City
Street: 18 Chapel Avenue
City / State: Jersey City NJ
Project #: NP000770.003
Client Purchase Order #:
Project Manager: Jim McLaughlin Jr.

Billing Information (if different from Report to)
Company Name:
Street Address:
City / State / Zip:
Attention:

Requested Analysis

SGS Sample #	Field ID / Point of Collection	MEOH/DI Vial #	Collection Date	Collection Time	Sampled by	Grab (G) Comp (C)	Matrix	# of bottles	Number of preserved Bottles: HCl	NaOH	HNO_3	H_2SO_4	NONE	DI Water	MEOH	ENCORE	Total Chromium	Trivalent Chromium	Hexavalent Chromium	Antimony	Nickel	Thallium	Vanadium	LAB USE ONLY
1	FB(20190311)		3/11/19	1200	CC	G	FB	2			1		1				X	X	X	X	X	X	X	
2	BS-D17A		3/11/19	1230	CC	G	SO	1					1				X	X	X	X	X	X	X	A19 G48
																								C5

Matrix Codes: DW - Drinking Water; GW - Ground Water; WW - Water; SW - Surface Water; SO - Soil; SL - Sludge; SED-Sediment; OI - Oil; LIQ - Other Liquid; AIR - Air; SOL - Other Solid; WP - Wipe; FB - Field Blank; EB-Equipment Blank; RB - Rinse Blank; TB - Trip Blank

Turn Around Time (Business Days)

Approved By (SGS PM): / Date:

- [ ] 10 Business Days
- [ ] 5 Business Days
- [ ] 3 Business Days*
- [x] 2 Business Days*
- [ ] 1 Business Day*
- [ ] Other

All data available via Lablink

* Approval needed for 1-3 Business Day TAT

Deliverable

- [ ] Commercial "A" (Level 1)
- [ ] Commercial "B" (Level 2)
- [ ] NJ Reduced (Level 3)
- [ ] Full Tier I (Level 4)
- [ ] Commercial "C"
- [ ] NJ DKQP
- [ ] NYASP Category A
- [ ] NYASP Category B
- [ ] MA MCP Criteria
- [ ] CT RCP Criteria
- [ ] State Forms
- [ ] EDD Format
- [ ] DOD-QSM5

"A" = Results only; "B" = Results + QC Summary
"C" = Results + QC Summary + Partial Raw data

Comments / Special Instructions

INITIAL ASESSMENT 3N (N)

LABEL VERIFICATION

http://www.sgs.com/en/terms-and-conditions

Sample Custody must be documented below each time samples change possession, including courier delivery.

	Relinquished by:	Date / Time:	Received By:	Date / Time:
1		3/11/19 1417	1 JSchan	3/11/19 1230
2	JSchan	3/11/19	2	1721
3			3	
4			4	
5			5	

Custody Seal #: 17160 — Intact / Not Intact — Preserved where applicable: Absent / Therm. ID: — On Ice: X — Cooler Temp. °C

CTP

36

EHSA-QAC-0023-02-FORM-Dayton - Standard COC.xlsx

Report of Analysis

Client Sample ID:	FB(20190311)		
Lab Sample ID:	JC84193-1	**Date Sampled:**	03/11/19
Matrix:	AQ - Field Blank Soil	**Date Received:**	03/11/19
		Percent Solids:	n/a
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	< 0.010	0.010	mg/l	1	03/11/19 21:33	MO	SW846 7196A
Redox Potential Vs H2	455		mv	1	03/12/19 21:32	EB	ASTM D1498-76
pH [a]	5.20		su	1	03/11/19 17:30	FR	SM4500H+ B-11

(a) Sample received out of holding time for pH analysis.

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-D17A		
Lab Sample ID:	JC84193-2	**Date Sampled:**	03/11/19
Matrix:	SO - Soil	**Date Received:**	03/11/19
		Percent Solids:	75.8
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	< 0.53 UJ-	0.53	mg/kg	1	03/20/19 17:17	RI	SW846 3060A/7196A
Redox Potential Vs H2	258		mv	1	03/17/19 10:46	JOO	ASTM D1498-76M
Solids, Percent	75.8		%	1	03/12/19 14:45	BG	SM2540 G 18TH ED MOD
pH	7.10 J		su	1	03/17/19 10:46	JOO	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-D17A		
Lab Sample ID:	JC84193-2R	**Date Sampled:**	03/11/19
Matrix:	SO - Soil	**Date Received:**	03/11/19
		Percent Solids:	75.8
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	< 0.53	0.53	mg/kg	1	04/03/19 20:08	JOO	SW846 3060A/7196A

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-D17A		
Lab Sample ID:	JC84193-2RT	**Date Sampled:**	03/11/19
Matrix:	SO - Soil	**Date Received:**	03/11/19
		Percent Solids:	75.8
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Iron, Ferrous [a]	1.1 J	0.20	%	1	04/15/19 08:30	MP	ASTM D3872-86
~~Sulfide Screen [b]~~	~~NEGATIVE~~			~~1~~	~~04/15/19~~	~~MP~~	~~SM4500S2- A-11~~ R
Total Organic Carbon [c]	17200 J	130	mg/kg	1	04/09/19 20:52	JO	LLOYD KAHN 1988 MOD

(a) Fe2 was analyzed after completion of Cr6 testing (outside of normal hold times for this parameter) in order to provide more information about the possible impact of the sample matrix on Cr6 recoveries.
(b) The sulfide screen test was analyzed after completion of Cr6 testing (outside of normal hold times for this parameter) in order to provide more information about the possible impact of the sample matrix on Cr6 recoveries.
(c) Analysis done out of holding time.

RL = Reporting Limit

Report of Analysis

Client Sample ID: FB(20190311)
Lab Sample ID: JC84193-1A
Matrix: AQ - Field Blank Soil
Project: PPG Site 107, 18 Chapel Avenue, Jersey City, NJ

Date Sampled: 03/11/19
Date Received: 03/11/19
Percent Solids: n/a

Total Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 6.0	6.0	ug/l	1	03/12/19	03/12/19	ND	SW846 6010D [1]	SW846 3010A [2]
Chromium	< 10	10	ug/l	1	03/12/19	03/12/19	ND	SW846 6010D [1]	SW846 3010A [2]
Nickel	< 10	10	ug/l	1	03/12/19	03/12/19	ND	SW846 6010D [1]	SW846 3010A [2]
Thallium	< 10	10	ug/l	1	03/12/19	03/12/19	ND	SW846 6010D [1]	SW846 3010A [2]
Vanadium	< 50	50	ug/l	1	03/12/19	03/12/19	ND	SW846 6010D [1]	SW846 3010A [2]

(1) Instrument QC Batch: MA46288
(2) Prep QC Batch: MP13055

RL = Reporting Limit

Report of Analysis

Client Sample ID:	FB(20190311)		
Lab Sample ID:	JC84193-1A	**Date Sampled:**	03/11/19
Matrix:	AQ - Field Blank Soil	**Date Received:**	03/11/19
		Percent Solids:	n/a
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	< 0.020	0.020	mg/l	1	03/12/19 16:50	ND	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-D17A		
Lab Sample ID:	JC84193-2A	**Date Sampled:**	03/11/19
Matrix:	SO - Soil	**Date Received:**	03/11/19
		Percent Solids:	75.8
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 2.6	2.6	mg/kg	1	03/12/19	03/12/19	MET	SW846 6010D [1]	SW846 3050B [2]
Chromium	80.5	1.3	mg/kg	1	03/12/19	03/12/19	MET	SW846 6010D [1]	SW846 3050B [2]
Nickel	22.5	5.2	mg/kg	1	03/12/19	03/12/19	MET	SW846 6010D [1]	SW846 3050B [2]
Thallium	< 1.3	1.3	mg/kg	1	03/12/19	03/12/19	MET	SW846 6010D [1]	SW846 3050B [2]
Vanadium	57.2	6.5	mg/kg	1	03/12/19	03/12/19	MET	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA46290
(2) Prep QC Batch: MP13027

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-D17A		
Lab Sample ID:	JC84193-2A	**Date Sampled:**	03/11/19
Matrix:	SO - Soil	**Date Received:**	03/11/19
		Percent Solids:	75.8
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	80.0	1.8	mg/kg	1	03/20/19 17:17	RI	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

SO
FB

CHAIN OF CUSTODY

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E/L

FED-EX Tracking #:
Bottle Order Control #: AK-035119-108
SGS Quote #:
SGS Job #: JC84194

Client / Reporting Information

Company Name: Arcadis
Street Address: 10 Friends Lane, Suite100
City / State / Zip: Newtown, PA 18940
Project Contact / E-mail: Matthew Bell
Phone #: 610-755-7080
Sampler(s) Name(s) / Phone #: C. Citelli

Project Information

Project Name: PPG Site 107 (Jersey City)
Street: 10 Chapel Avenue
City / State: Jersey City NJ
Project #: NP000720.0003
Client Purchase Order #:
Project Manager: Jim McLaughlin, Jr.

Billing Information (if different from Report to)

Company Name:
Street Address:
City / State / Zip:
Attention:

Requested Analysis

Matrix Codes: DW - Drinking Water; GW - Ground Water; WW - Water; SW - Surface Water; SO - Soil; SL- Sludge; SED-Sediment; OI - Oil; LIQ - Other Liquid; AIR - Air; SOL - Other Solid; WP - Wipe; FB - Field Blank; EB-Equipment Blank; RB - Rinse Blank; TB - Trip Blank

SGS Sample #	Field ID / Point of Collection	MEOH/DI Vial #	Collection Date	Collection Time	Sampled by	Grab (G) Comp (C)	Matrix	# of bottles	Number of preserved Bottles: HCl	NaOH	HNO_3	H_2SO_4	NONE	DI Water	MEOH	ENCORE	Total Chromium	Trivalent Chromium	Hexavalent Chromium	Antimony	Nickel	Thallium	Vanadium	LAB USE ONLY
1	FB(20190311)-A		3/11/19	1145	CC	G	FB	2			1		1				X	X	X	X	X	X	X	
2	BS-B1		3/11/19	1345	CC	G	SO	1					1				X	X	X	X	X	X	X	A19 G48 c5

Turn Around Time (Business Days)

Approved By (SGS PM): / Date:

- [ ] 10 Business Days
- [ ] 5 Business Days
- [ ] 3 Business Days*
- [x] 2 Business Days*
- [ ] 1 Business Day*
- [ ] Other

All data available via Lablink

* Approval needed for 1-3 Business Day TAT

Deliverable

- [ ] Commercial "A" (Level 1)
- [ ] Commercial "B" (Level 2)
- [ ] NJ Reduced (Level 3)
- [ ] Full Tier I (Level 4)
- [ ] Commercial "C"
- [ ] NJ DKQP
- [ ] NYASP Category A
- [ ] NYASP Category B
- [ ] MA MCP Criteria_____
- [ ] CT RCP Criteria_____
- [ ] State Forms
- [ ] EDD Format _____
- [ ] DOD-QSM5

Commercial "A" = Results only; Commercial "B" = Results + QC Summary
Commercial "C" = Results + QC Summary + Partial Raw data

Comments / Special Instructions

* Please pulverize sample if nodules exist.

INITIAL ASSESSMENT 3A (N)

LABEL VERIFICATION

http://www.sgs.com/en/terms-and-conditions

Sample Custody must be documented below each time samples change possession, including courier delivery.

Relinquished by:	Date / Time:	Received By:	Relinquished by:	Date / Time:	Received By:
1	3/11/19/1417	1 FSC HAN 3/11/19 230	2 FSC HAN 3/11/19	1712	2
3		3	4		4
5		5	Custody Seal # 17160	Intact / Not intact	Preserved where applicable / Absent — Therm. ID: — On Ice: X — Cooler Temp. °C

EHSA-QAC-0023-02-FORM-Dayton - Standard COC.xlsx

CIP
36

Report of Analysis

Client Sample ID:	FB(20190311)-A		
Lab Sample ID:	JC84194-1	**Date Sampled:**	03/11/19
Matrix:	AQ - Field Blank Soil	**Date Received:**	03/11/19
		Percent Solids:	n/a
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	< 0.010	0.010	mg/l	1	03/11/19 21:33	MO	SW846 7196A
Redox Potential Vs H2	336		mv	1	03/12/19 21:25	EB	ASTM D1498-76
pH [a]	4.25 J		su	1	03/12/19 21:14	EB	SM4500H+ B-11

(a) Field analysis required. Received out of hold time and analyzed by request.

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-B1		
Lab Sample ID:	JC84194-2	**Date Sampled:**	03/11/19
Matrix:	SO - Soil	**Date Received:**	03/11/19
		Percent Solids:	86.3
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	2.7 J	0.46	mg/kg	1	03/20/19 18:15	RI	SW846 3060A/7196A
Redox Potential Vs H2	266		mv	1	03/17/19 10:49	JOO	ASTM D1498-76M
Solids, Percent	86.3		%	1	03/12/19 14:45	BG	SM2540 G 18TH ED MOD
pH	7.76 J		su	1	03/17/19 08:57	JOO	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID: FB(20190311)-A
Lab Sample ID: JC84194-1A
Matrix: AQ - Field Blank Soil
Project: PPG Site 107, 18 Chapel Avenue, Jersey City, NJ

Date Sampled: 03/11/19
Date Received: 03/11/19
Percent Solids: n/a

Total Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 6.0	6.0	ug/l	1	03/12/19	03/12/19	ND	SW846 6010D [1]	SW846 3010A [2]
Chromium	< 10	10	ug/l	1	03/12/19	03/12/19	ND	SW846 6010D [1]	SW846 3010A [2]
Nickel	< 10	10	ug/l	1	03/12/19	03/12/19	ND	SW846 6010D [1]	SW846 3010A [2]
Thallium	< 10	10	ug/l	1	03/12/19	03/12/19	ND	SW846 6010D [1]	SW846 3010A [2]
Vanadium	< 50	50	ug/l	1	03/12/19	03/12/19	ND	SW846 6010D [1]	SW846 3010A [2]

(1) Instrument QC Batch: MA46288
(2) Prep QC Batch: MP13055

RL = Reporting Limit

Report of Analysis

Client Sample ID:	FB(20190311)-A		
Lab Sample ID:	JC84194-1A	**Date Sampled:**	03/11/19
Matrix:	AQ - Field Blank Soil	**Date Received:**	03/11/19
		Percent Solids:	n/a
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	< 0.020	0.020	mg/l	1	03/12/19 16:55	ND	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID: BS-B1
Lab Sample ID: JC84194-2A
Matrix: SO - Soil
Project: PPG Site 107, 18 Chapel Avenue, Jersey City, NJ

Date Sampled: 03/11/19
Date Received: 03/11/19
Percent Solids: 86.3

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 2.3	2.3	mg/kg	1	03/12/19	03/12/19	MET	SW846 6010D [1]	SW846 3050B [2]
Chromium	10.1	1.1	mg/kg	1	03/12/19	03/12/19	MET	SW846 6010D [1]	SW846 3050B [2]
Nickel	8.5	4.5	mg/kg	1	03/12/19	03/12/19	MET	SW846 6010D [1]	SW846 3050B [2]
Thallium	< 1.1	1.1	mg/kg	1	03/12/19	03/12/19	MET	SW846 6010D [1]	SW846 3050B [2]
Vanadium	12.3	5.7	mg/kg	1	03/12/19	03/12/19	MET	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA46290
(2) Prep QC Batch: MP13027

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-B1		
Lab Sample ID:	JC84194-2A	**Date Sampled:**	03/11/19
Matrix:	SO - Soil	**Date Received:**	03/11/19
		Percent Solids:	86.3
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	7.4	1.6	mg/kg	1	03/20/19 18:15	RI	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

SO, SOL
FB

CHAIN OF CUSTODY

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E
CR

FED-EX Tracking #:
SGS Quote #:
Bottle Order Control #: AR-011719-177
SGS Job #: JC84245

Client / Reporting Information

Company Name: Arcadis
Street Address: 10 Friends Lane, Suite 100
City: Newtown State: PA Zip: 18940
Project Contact: Matthew Boll
E-mail:
Phone #: 610-755-7080
Sampler(s) Name(s): C. Citelli
Phone #:

Project Information

Project Name: PPG Site 107 (Jersey City)
Street: 10 Chapel Avenue
City: Jersey City State: NJ
Project #: NP000770.0003
Client Purchase Order #:
Billing Information (if different from Report to)
Company Name:
Street Address:
City: State: Zip:
Attention:
Project Manager: Jim McLaughlin, NJ

Requested Analysis

SGS Sample #	Field ID / Point of Collection	MEOH/DI Vial #	Collection Date	Collection Time	Sampled by	Grab (G) Comp (C)	Matrix	# of bottles	Number of preserved Bottles: HCl	NaOH	HNO3	H2SO4	NONE	DI Water	MEOH	ENCORE	Hexavalent Chromium	Trivalent Chromium	Total Chromium	Antimony	Nickel	Thallium	Vanadium	LAB USE ONLY
1	FB(20190312)-A		3/12/19	0800	CC	G	FB	2			1		1				X	X	X	X	X	X	X	
2	SW-A30(0.0-0.5)		3/12/19	0945	CC	G	SO	1					1				X	X	X	X	X	X	X	CS
3	SW-A30(2.0-2.5)		3/12/19	0950	CC	G	SO	1					1				X	X	X	X	X	X	X	
4	SW-A30(4.0-4.5)		3/12/19	0955	CC	G	SO	1					1				X	X	X	X	X	X	X	AIG
5	SW-A30(6.0-6.5)		3/12/19	1000	CC	G	SO	1					1				X	X	X	X	X	X	X	BIB
6	SW-A30(8.0-8.5)		3/12/19	1005	CC	G	SO	1					1				X	X	X	X	X	X	X	
7	SW-A31(0.0-0.5)		3/12/19	1020	CC	G	SO	1					1				X	X	X	X	X	X	X	
8	SW-A31(2.0-2.5)		3/12/19	1025	CC	G	SO	1					1				X	X	X	X	X	X	X	
9	SW-A32(0.0-0.5)		3/12/19	1035	CC	G	SO	1					1				X	X	X	X	X	X	X	
10	SW-A32(2.0-2.5)		3/12/19	1040	CC	G	SO	1					1				X	X	X	X	X	X	X	
11	SW-A33(0.0-0.5)		3/12/19	1045	CC	G	SO	1					1				X	X	X	X	X	X	X	
12	107-M032N		3/12/19	1010	CC	G	SO	1					1				X	X	X	X	X	X	X	

Matrix Codes
DW - Drinking Water
GW - Ground Water
WW - Water
SW - Surface Water
SO - Soil
SL - Sludge
SED - Sediment
OI - Oil
LIQ - Other Liquid
AIR - Air
SOL - Other Solid
WP - Wipe
FB - Field Blank
EB - Equipment Blank
RB - Rinse Blank
TB - Trip Blank

Turn Around Time (Business Days)
Approved By (SGS PM); / Date:
- [ ] 10 Business Days
- [ ] 5 Business Days
- [ ] 3 Business Days*
- [X] 2 Business Days* (A)
- [ ] 1 Business Day*
- [ ] Other
All data available via Labilnk
* Approval needed for 1-3 Business Day TAT

Deliverable
- [ ] Commercial "A" (Level 1)
- [ ] Commercial "B" (Level 2)
- [ ] NJ Reduced (Level 3)
- [ ] Full Tier I (Level 4)
- [ ] Commercial "C"
- [ ] NJ DKQP
- [ ] NYASP Category A
- [ ] NYASP Category B
- [ ] MA MCP Criteria
- [ ] CT RCP Criteria
- [ ] State Forms
- [X] EDD Format EQuIS
- [ ] DOD-QSM5

Commercial "A" = Results only; Commercial "B" = Results + QC Summary
Commercial "C" = Results + QC Summary + Partial Raw data

Comments / Special Instructions
http://www.sgs.com/en/terms-and-conditions

Sample Custody must be documented below each time samples change possession, including courier delivery.

	Relinquished by:	Date / Time:	Received By:
1		3/12/19 1420	Robert Chambers
2	Robert Chambers	3-12-19 1645	
3			
4			
5			

Custody Seal # 11014 [ ] Intact [ ] Not Intact
Preserved where applicable [ ] Absent
[ ] Therm. ID:
On Ice: X
Cooler Temp. °C: 3.1c

INITIAL ASESSMENT LR4A

LABEL VERIFICATION

EHSA-QAC-0023-02-FORM-Dayton - Standard COC.xlsx

5.2
5

CHAIN OF CUSTODY

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PAGE 2 OF 2

FED-EX Tracking #: | Bottle Order Control #: AR-03519-108
SGS Quote #: | SGS Job #: JC84245

Client / Reporting Information | **Project Information** | **Requested Analysis (see TEST CODE sheet)** | Matrix Codes

Company Name: Groundis
Street Address: 10 Friends Lane, Suite 200
City: Newtown, PA State: Zip: 18940
Project Contact: Matt Bell E-mail:
Phone #: 610. 755. 7080 Fax #:
Sampler(s) Name(s): C. Ciulli Phone #:

Project Name: PPG Site 107 Jersey City
Street: 18 Chapel Ave
City: Jersey City State: NJ
Project #: N8000770.0003
Client Purchase Order #:
Project Manager: Jim McLaughlin

Billing Information (if different from Report to)
Company Name:
Street Address:
City: State: Zip:
Attention:

Matrix Codes: DW - Drinking Water; GW - Ground Water; WW - Water; SW - Surface Water; SO - Soil; SL- Sludge; SED-Sediment; OI - Oil; LIQ - Other Liquid; AIR - Air; SOL - Other Solid; WP - Wipe; ~~FB-Field Blank~~; EB-Equipment Blank; RB- Rinse Blank; TB-Trip Blank

Lab Sample #	Field ID / Point of Collection	MEOH/DI Vial #	Collection Date	Collection Time	Sampled by	Matrix	# of bottles	Number of preserved bottles: HCl	NaOH	HNO3	H2SO4	NONE	DI Water	MEOH	ENCORE	Total Chromium	Hexavalent Chromium	Trivalent Chromium	Antimony	Nickel	Thallium	Vanadium			LAB USE ONLY
	~~FB(20190312)~~ (C)		~~3/12/19~~	~~0810~~	~~CC~~	~~FB~~	~~2~~			1		1				X	X	X	X	X	X	X	(C)		
13	BS-AIC		3/12/19	1345	CC	SO	1					1				X	X	X	X	X	X	X			
14	108-CONC-AI		3/12/19	1400	CC	O	1					1				X	X	X	X	X	X	X			

Turnaround Time (Business days)

Approved by (SGS Project Manager)/Date:

- [ ] Std. 10 Business Days
- [ ] 5 Day RUSH
- [ ] 3 Day RUSH
- [x] 2 Day RUSH (A)
- [ ] 1 Day RUSH
- [ ] other

Emergency & Rush T/A data available via LabLink

Data Deliverable Information

- [ ] Commercial "A" (Level 1)
- [ ] Commercial "B" (Level 2)
- [ ] FULLT1 (Level 3+4)
- [ ] NJ Reduced
- [ ] Commercial "C"
- [ ] NJ Data of Known Quality Protocol Reporting
- [ ] NYASP Category A
- [ ] NYASP Category B
- [ ] State Forms
- [x] EDD Format Equis
- [ ] Other

Commercial "A" = Results Only; Commercial "B" = Results + QC Summary
NJ Reduced = Results + QC Summary + Partial Raw data

Comments / Special Instructions

Sample inventory is verified upon receipt in the Laboratory

Sample Custody must be documented below each time samples change possession, including courier delivery.

	Relinquished by Sampler:	Date Time:	Received By:	Relinquished By:	Date Time:	Received By:
1		3/12/19 1420	1 Robert Chambers	2 Robert Chambers	3.12.19 1645	2
3			3	4		4
5			5	Custody Seal # 11014 ☐ Intact ☐ Not intact	Preserved where applicable ☐	On Ice ☒ Cooler Temp. IG 3.1 °C

Form:SM088-03C (revised 2/12/18)

http://www.sgs.com/en/terms-and-conditions.

Report of Analysis

Client Sample ID:	FB(20190312)-A		
Lab Sample ID:	JC84245-1	**Date Sampled:**	03/12/19
Matrix:	AQ - Field Blank Soil	**Date Received:**	03/12/19
		Percent Solids:	n/a
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	< 0.010	0.010	mg/l	1	03/12/19 20:30	JOO	SW846 7196A
Redox Potential Vs H2	619		mv	1	03/18/19 00:12	EB	ASTM D1498-76
pH [a]	4.60		su	1	03/12/19 17:30	AS	SM4500H+ B-11

(a) Sample received out of holding time for pH analysis.

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A30(0.0-0.5)		
Lab Sample ID:	JC84245-2	**Date Sampled:**	03/12/19
Matrix:	SO - Soil	**Date Received:**	03/12/19
		Percent Solids:	91.2
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	3.1 J	0.44	mg/kg	1	03/20/19 18:25	JOO	SW846 3060A/7196A
Redox Potential Vs H2	294		mv	1	03/19/19 22:33	EB	ASTM D1498-76M
Solids, Percent	91.2		%	1	03/13/19 12:45	BG	SM2540 G 18TH ED MOD
pH	7.54 J		su	1	03/19/19 22:34	EB	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A30(2.0-2.5)		
Lab Sample ID:	JC84245-3	**Date Sampled:**	03/12/19
Matrix:	SO - Soil	**Date Received:**	03/12/19
		Percent Solids:	85.8
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	18.5 J	0.47	mg/kg	1	03/20/19 18:29	JOO	SW846 3060A/7196A
Redox Potential Vs H2	269		mv	1	03/19/19 22:35	EB	ASTM D1498-76M
Solids, Percent	85.8		%	1	03/13/19 12:45	BG	SM2540 G 18TH ED MOD
pH	8.30 J		su	1	03/19/19 22:35	EB	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A30(4.0-4.5)		
Lab Sample ID:	JC84245-4	**Date Sampled:**	03/12/19
Matrix:	SO - Soil	**Date Received:**	03/12/19
		Percent Solids:	75.3
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	< 0.53 UJ	0.53	mg/kg	1	03/20/19 18:29	JOO	SW846 3060A/7196A
Redox Potential Vs H2	230		mv	1	03/19/19 22:40	EB	ASTM D1498-76M
Solids, Percent	75.3		%	1	03/13/19 12:45	BG	SM2540 G 18TH ED MOD
pH	7.12 J		su	1	03/19/19 22:40	EB	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A30(6.0-6.5)		
Lab Sample ID:	JC84245-5	**Date Sampled:**	03/12/19
Matrix:	SO - Soil	**Date Received:**	03/12/19
		Percent Solids:	80.3
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	< 0.50 UJ	0.50	mg/kg	1	03/20/19 18:29	JOO	SW846 3060A/7196A
Redox Potential Vs H2	185		mv	1	03/19/19 22:45	EB	ASTM D1498-76M
Solids, Percent	80.3		%	1	03/13/19 12:45	BG	SM2540 G 18TH ED MOD
pH	7.00 J		su	1	03/19/19 22:45	EB	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A30(8.0-8.5)		
Lab Sample ID:	JC84245-6	**Date Sampled:**	03/12/19
Matrix:	SO - Soil	**Date Received:**	03/12/19
		Percent Solids:	74.4
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	< 0.54 UJ	0.54	mg/kg	1	03/20/19 18:29	JOO	SW846 3060A/7196A
Redox Potential Vs H2	186		mv	1	03/19/19 22:49	EB	ASTM D1498-76M
Solids, Percent	74.4		%	1	03/13/19 12:45	BG	SM2540 G 18TH ED MOD
pH	6.97 J		su	1	03/19/19 22:49	EB	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID: SW-A31(0.0-0.5)
Lab Sample ID: JC84245-7
Matrix: SO - Soil
Project: PPG Site 107, 18 Chapel Avenue, Jersey City, NJ

Date Sampled: 03/12/19
Date Received: 03/12/19
Percent Solids: 79.0

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	3.3 J	0.51	mg/kg	1	03/20/19 18:29	JOO	SW846 3060A/7196A
Redox Potential Vs H2	305		mv	1	03/19/19 22:55	EB	ASTM D1498-76M
Solids, Percent	79		%	1	03/13/19 12:45	BG	SM2540 G 18TH ED MOD
pH	6.56 J		su	1	03/19/19 22:55	EB	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID: SW-A31(2.0-2.5)
Lab Sample ID: JC84245-8
Matrix: SO - Soil
Project: PPG Site 107, 18 Chapel Avenue, Jersey City, NJ

Date Sampled: 03/12/19
Date Received: 03/12/19
Percent Solids: 77.6

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	3.2 J	0.52	mg/kg	1	03/20/19 18:29	JOO	SW846 3060A/7196A
Redox Potential Vs H2	340		mv	1	03/20/19 20:48	MET	ASTM D1498-76M
Solids, Percent	77.6		%	1	03/13/19 12:45	BG	SM2540 G 18TH ED MOD
pH	7.56 J		su	1	03/20/19 20:49	EB	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A32(0.0-0.5)		
Lab Sample ID:	JC84245-9	**Date Sampled:**	03/12/19
Matrix:	SO - Soil	**Date Received:**	03/12/19
		Percent Solids:	80.3
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	< 0.50 UJ	0.50	mg/kg	1	03/20/19 18:29	JOO	SW846 3060A/7196A
Redox Potential Vs H2	353		mv	1	03/20/19 20:44	MET	ASTM D1498-76M
Solids, Percent	80.3		%	1	03/13/19 12:45	BG	SM2540 G 18TH ED MOD
pH	6.28 J		su	1	03/20/19 20:45	EB	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A32(2.0-2.5)		
Lab Sample ID:	JC84245-10	**Date Sampled:**	03/12/19
Matrix:	SO - Soil	**Date Received:**	03/12/19
		Percent Solids:	82.5
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	1.3 J	0.48	mg/kg	1	03/20/19 18:29	JOO	SW846 3060A/7196A
Redox Potential Vs H2	356		mv	1	03/20/19 20:53	MET	ASTM D1498-76M
Solids, Percent	82.5		%	1	03/13/19 12:45	BG	SM2540 G 18TH ED MOD
pH	7.54 J		su	1	03/20/19 20:54	EB	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A33(0.0-0.5)		
Lab Sample ID:	JC84245-11	**Date Sampled:**	03/12/19
Matrix:	SO - Soil	**Date Received:**	03/12/19
		Percent Solids:	78.2
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	< 0.51 UJ	0.51	mg/kg	1	03/20/19 18:29	JOO	SW846 3060A/7196A
Redox Potential Vs H2	392		mv	1	03/20/19 20:56	MET	ASTM D1498-76M
Solids, Percent	78.2		%	1	03/13/19 12:45	BG	SM2540 G 18TH ED MOD
pH	6.24 J		su	1	03/20/19 20:56	EB	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID:	108_CONC-B1		
Lab Sample ID:	JC84245-14	**Date Sampled:**	03/12/19
Matrix:	SO - Soil	**Date Received:**	03/12/19
		Percent Solids:	91.4
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	12.3 J	0.44	mg/kg	1	03/20/19 18:29	JOO	SW846 3060A/7196A
Redox Potential Vs H2	126		mv	1	03/20/19 20:57	MET	ASTM D1498-76M
Solids, Percent	91.4		%	1	03/13/19 12:45	BG	SM2540 G 18TH ED MOD
pH	11.19 J		su	1	03/20/19 20:57	EB	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID: FB(20190312)-A
Lab Sample ID: JC84245-1A
Matrix: AQ - Field Blank Soil
Project: PPG Site 107, 18 Chapel Avenue, Jersey City, NJ

Date Sampled: 03/12/19
Date Received: 03/12/19
Percent Solids: n/a

Total Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 6.0	6.0	ug/l	1	03/13/19	03/13/19	ND	SW846 6010D [1]	SW846 3010A [2]
Chromium	< 10	10	ug/l	1	03/13/19	03/13/19	ND	SW846 6010D [1]	SW846 3010A [2]
Nickel	< 10	10	ug/l	1	03/13/19	03/13/19	ND	SW846 6010D [1]	SW846 3010A [2]
Thallium	< 10	10	ug/l	1	03/13/19	03/13/19	ND	SW846 6010D [1]	SW846 3010A [2]
Vanadium	< 50	50	ug/l	1	03/13/19	03/13/19	ND	SW846 6010D [1]	SW846 3010A [2]

(1) Instrument QC Batch: MA46296
(2) Prep QC Batch: MP13077

RL = Reporting Limit

Report of Analysis

Client Sample ID:	FB(20190312)-A		
Lab Sample ID:	JC84245-1A	**Date Sampled:**	03/12/19
Matrix:	AQ - Field Blank Soil	**Date Received:**	03/12/19
		Percent Solids:	n/a
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	< 0.020	0.020	mg/l	1	03/13/19 14:48	ND	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID: SW-A30(0.0-0.5)
Lab Sample ID: JC84245-2A
Matrix: SO - Soil
Project: PPG Site 107, 18 Chapel Avenue, Jersey City, NJ

Date Sampled: 03/12/19
Date Received: 03/12/19
Percent Solids: 91.2

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 2.1	2.1	mg/kg	1	03/13/19	03/13/19	ND	SW846 6010D [1]	SW846 3050B [2]
Chromium	82.5	1.1	mg/kg	1	03/13/19	03/13/19	ND	SW846 6010D [1]	SW846 3050B [2]
Nickel	23.7	4.2	mg/kg	1	03/13/19	03/13/19	ND	SW846 6010D [1]	SW846 3050B [2]
Thallium [a]	< 2.1	2.1	mg/kg	2	03/13/19	03/13/19	ND	SW846 6010D [1]	SW846 3050B [2]
Vanadium	39.5	5.3	mg/kg	1	03/13/19	03/13/19	ND	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA46296
(2) Prep QC Batch: MP13076

(a) Elevated detection limit due to dilution required for high interfering element.

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A30(0.0-0.5)		
Lab Sample ID:	JC84245-2A	**Date Sampled:**	03/12/19
Matrix:	SO - Soil	**Date Received:**	03/12/19
		Percent Solids:	91.2
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	79.4	1.5	mg/kg	1	03/20/19 18:25	JOO	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A30(2.0-2.5)		
Lab Sample ID:	JC84245-3A	**Date Sampled:**	03/12/19
Matrix:	SO - Soil	**Date Received:**	03/12/19
		Percent Solids:	85.8
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 2.2	2.2	mg/kg	1	03/13/19	03/13/19	ND	SW846 6010D [1]	SW846 3050B [2]
Chromium	233	1.1	mg/kg	1	03/13/19	03/13/19	ND	SW846 6010D [1]	SW846 3050B [2]
Nickel	28.7	4.5	mg/kg	1	03/13/19	03/13/19	ND	SW846 6010D [1]	SW846 3050B [2]
Thallium	< 1.1	1.1	mg/kg	1	03/13/19	03/13/19	ND	SW846 6010D [1]	SW846 3050B [2]
Vanadium	54.5	5.6	mg/kg	1	03/13/19	03/13/19	ND	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA46296
(2) Prep QC Batch: MP13076

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A30(2.0-2.5)		
Lab Sample ID:	JC84245-3A	**Date Sampled:**	03/12/19
Matrix:	SO - Soil	**Date Received:**	03/12/19
		Percent Solids:	85.8
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	215	1.6	mg/kg	1	03/20/19 18:29	JOO	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A30(4.0-4.5)		
Lab Sample ID:	JC84245-4A	**Date Sampled:**	03/12/19
Matrix:	SO - Soil	**Date Received:**	03/12/19
		Percent Solids:	75.3
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 2.6	2.6	mg/kg	1	03/13/19	03/13/19	ND	SW846 6010D [1]	SW846 3050B [2]
Chromium	11.4	1.3	mg/kg	1	03/13/19	03/13/19	ND	SW846 6010D [1]	SW846 3050B [2]
Nickel	12.4	5.2	mg/kg	1	03/13/19	03/13/19	ND	SW846 6010D [1]	SW846 3050B [2]
Thallium	< 1.3	1.3	mg/kg	1	03/13/19	03/13/19	ND	SW846 6010D [1]	SW846 3050B [2]
Vanadium	16.6	6.5	mg/kg	1	03/13/19	03/13/19	ND	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA46296
(2) Prep QC Batch: MP13076

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A30(4.0-4.5)		
Lab Sample ID:	JC84245-4A	**Date Sampled:**	03/12/19
Matrix:	SO - Soil	**Date Received:**	03/12/19
		Percent Solids:	75.3
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	11.4	1.8	mg/kg	1	03/20/19 18:29	JOO	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A30(6.0-6.5)		
Lab Sample ID:	JC84245-5A	**Date Sampled:**	03/12/19
Matrix:	SO - Soil	**Date Received:**	03/12/19
		Percent Solids:	80.3
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 2.4	2.4	mg/kg	1	03/13/19	03/14/19	ND	SW846 6010D [1]	SW846 3050B [2]
Chromium	13.9	1.2	mg/kg	1	03/13/19	03/14/19	ND	SW846 6010D [1]	SW846 3050B [2]
Nickel	11.7	4.9	mg/kg	1	03/13/19	03/14/19	ND	SW846 6010D [1]	SW846 3050B [2]
Thallium	< 1.2	1.2	mg/kg	1	03/13/19	03/14/19	ND	SW846 6010D [1]	SW846 3050B [2]
Vanadium	21.1	6.1	mg/kg	1	03/13/19	03/14/19	ND	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA46296
(2) Prep QC Batch: MP13076

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A30(6.0-6.5)		
Lab Sample ID:	JC84245-5A	**Date Sampled:**	03/12/19
Matrix:	SO - Soil	**Date Received:**	03/12/19
		Percent Solids:	80.3
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	13.9	1.7	mg/kg	1	03/20/19 18:29	JOO	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A30(8.0-8.5)		
Lab Sample ID:	JC84245-6A	**Date Sampled:**	03/12/19
Matrix:	SO - Soil	**Date Received:**	03/12/19
		Percent Solids:	74.4
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 2.7	2.7	mg/kg	1	03/13/19	03/13/19	ND	SW846 6010D [1]	SW846 3050B [2]
Chromium	12.2	1.3	mg/kg	1	03/13/19	03/13/19	ND	SW846 6010D [1]	SW846 3050B [2]
Nickel	11.7	5.3	mg/kg	1	03/13/19	03/13/19	ND	SW846 6010D [1]	SW846 3050B [2]
Thallium	< 1.3	1.3	mg/kg	1	03/13/19	03/13/19	ND	SW846 6010D [1]	SW846 3050B [2]
Vanadium	17.5	6.7	mg/kg	1	03/13/19	03/13/19	ND	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA46296
(2) Prep QC Batch: MP13076

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A30(8.0-8.5)		
Lab Sample ID:	JC84245-6A	**Date Sampled:**	03/12/19
Matrix:	SO - Soil	**Date Received:**	03/12/19
		Percent Solids:	74.4
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	12.2	1.8	mg/kg	1	03/20/19 18:29	JOO	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID: SW-A31(0.0-0.5)
Lab Sample ID: JC84245-7A
Matrix: SO - Soil
Project: PPG Site 107, 18 Chapel Avenue, Jersey City, NJ

Date Sampled: 03/12/19
Date Received: 03/12/19
Percent Solids: 79.0

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 2.4	2.4	mg/kg	1	03/13/19	03/13/19	ND	SW846 6010D [1]	SW846 3050B [2]
Chromium	51.0	1.2	mg/kg	1	03/13/19	03/13/19	ND	SW846 6010D [1]	SW846 3050B [2]
Nickel	29.3	4.8	mg/kg	1	03/13/19	03/13/19	ND	SW846 6010D [1]	SW846 3050B [2]
Thallium	< 1.2	1.2	mg/kg	1	03/13/19	03/13/19	ND	SW846 6010D [1]	SW846 3050B [2]
Vanadium	39.3	6.0	mg/kg	1	03/13/19	03/13/19	ND	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA46296
(2) Prep QC Batch: MP13076

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A31(0.0-0.5)		
Lab Sample ID:	JC84245-7A	**Date Sampled:**	03/12/19
Matrix:	SO - Soil	**Date Received:**	03/12/19
		Percent Solids:	79.0
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	47.7	1.7	mg/kg	1	03/20/19 18:29	JOO	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A31(2.0-2.5)		
Lab Sample ID:	JC84245-8A	**Date Sampled:**	03/12/19
Matrix:	SO - Soil	**Date Received:**	03/12/19
		Percent Solids:	77.6
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 2.5	2.5	mg/kg	1	03/13/19	03/13/19	ND	SW846 6010D [1]	SW846 3050B [2]
Chromium	86.9	1.3	mg/kg	1	03/13/19	03/13/19	ND	SW846 6010D [1]	SW846 3050B [2]
Nickel	23.9	5.1	mg/kg	1	03/13/19	03/13/19	ND	SW846 6010D [1]	SW846 3050B [2]
Thallium	< 1.3	1.3	mg/kg	1	03/13/19	03/13/19	ND	SW846 6010D [1]	SW846 3050B [2]
Vanadium	38.4	6.3	mg/kg	1	03/13/19	03/13/19	ND	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA46296
(2) Prep QC Batch: MP13076

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A31(2.0-2.5)		
Lab Sample ID:	JC84245-8A	**Date Sampled:**	03/12/19
Matrix:	SO - Soil	**Date Received:**	03/12/19
		Percent Solids:	77.6
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	83.7	1.8	mg/kg	1	03/20/19 18:29	JOO	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A32(0.0-0.5)		
Lab Sample ID:	JC84245-9A	**Date Sampled:**	03/12/19
Matrix:	SO - Soil	**Date Received:**	03/12/19
		Percent Solids:	80.3
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 2.4	2.4	mg/kg	1	03/13/19	03/13/19	ND	SW846 6010D [1]	SW846 3050B [2]
Chromium	23.0	1.2	mg/kg	1	03/13/19	03/13/19	ND	SW846 6010D [1]	SW846 3050B [2]
Nickel	17.2	4.9	mg/kg	1	03/13/19	03/13/19	ND	SW846 6010D [1]	SW846 3050B [2]
Thallium	< 1.2	1.2	mg/kg	1	03/13/19	03/13/19	ND	SW846 6010D [1]	SW846 3050B [2]
Vanadium	45.1	6.1	mg/kg	1	03/13/19	03/13/19	ND	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA46296
(2) Prep QC Batch: MP13076

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A32(0.0-0.5)		
Lab Sample ID:	JC84245-9A	**Date Sampled:**	03/12/19
Matrix:	SO - Soil	**Date Received:**	03/12/19
		Percent Solids:	80.3
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	23.0	1.7	mg/kg	1	03/20/19 18:29	JOO	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A32(2.0-2.5)		
Lab Sample ID:	JC84245-10A	**Date Sampled:**	03/12/19
Matrix:	SO - Soil	**Date Received:**	03/12/19
		Percent Solids:	82.5
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 2.3	2.3	mg/kg	1	03/13/19	03/13/19	ND	SW846 6010D [1]	SW846 3050B [2]
Chromium	29.2	1.2	mg/kg	1	03/13/19	03/13/19	ND	SW846 6010D [1]	SW846 3050B [2]
Nickel	18.2	4.6	mg/kg	1	03/13/19	03/13/19	ND	SW846 6010D [1]	SW846 3050B [2]
Thallium [a]	< 2.3	2.3	mg/kg	2	03/13/19	03/14/19	ND	SW846 6010D [1]	SW846 3050B [2]
Vanadium	28.7	5.8	mg/kg	1	03/13/19	03/13/19	ND	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA46296
(2) Prep QC Batch: MP13076

(a) Elevated detection limit due to dilution required for high interfering element.

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A32(2.0-2.5)		
Lab Sample ID:	JC84245-10A	**Date Sampled:**	03/12/19
Matrix:	SO - Soil	**Date Received:**	03/12/19
		Percent Solids:	82.5
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	27.9	1.7	mg/kg	1	03/20/19 18:29	JOO	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A33(0.0-0.5)		
Lab Sample ID:	JC84245-11A	**Date Sampled:**	03/12/19
Matrix:	SO - Soil	**Date Received:**	03/12/19
		Percent Solids:	78.2
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 2.5	2.5	mg/kg	1	03/13/19	03/13/19	ND	SW846 6010D [1]	SW846 3050B [2]
Chromium	21.3	1.2	mg/kg	1	03/13/19	03/13/19	ND	SW846 6010D [1]	SW846 3050B [2]
Nickel	16.0	5.0	mg/kg	1	03/13/19	03/13/19	ND	SW846 6010D [1]	SW846 3050B [2]
Thallium	< 1.2	1.2	mg/kg	1	03/13/19	03/13/19	ND	SW846 6010D [1]	SW846 3050B [2]
Vanadium	41.2	6.2	mg/kg	1	03/13/19	03/13/19	ND	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA46296
(2) Prep QC Batch: MP13076

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A33(0.0-0.5)		
Lab Sample ID:	JC84245-11A	**Date Sampled:**	03/12/19
Matrix:	SO - Soil	**Date Received:**	03/12/19
		Percent Solids:	78.2
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	21.3	1.7	mg/kg	1	03/20/19 18:29	JOO	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	108_CONC-B1		
Lab Sample ID:	JC84245-14A	**Date Sampled:**	03/12/19
Matrix:	SO - Soil	**Date Received:**	03/12/19
		Percent Solids:	91.4
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 2.2	2.2	mg/kg	1	03/13/19	03/13/19	ND	SW846 6010D [1]	SW846 3050B [2]
Chromium	81.6	1.1	mg/kg	1	03/13/19	03/13/19	ND	SW846 6010D [1]	SW846 3050B [2]
Nickel	17.5	4.3	mg/kg	1	03/13/19	03/13/19	ND	SW846 6010D [1]	SW846 3050B [2]
Thallium [a]	< 3.2	3.2	mg/kg	3	03/13/19	03/13/19	ND	SW846 6010D [1]	SW846 3050B [2]
Vanadium	30.3	5.4	mg/kg	1	03/13/19	03/13/19	ND	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA46296
(2) Prep QC Batch: MP13076

(a) Elevated detection limit due to dilution required for high interfering element.

RL = Reporting Limit

Report of Analysis

Client Sample ID:	108_CONC-B1		
Lab Sample ID:	JC84245-14A	**Date Sampled:**	03/12/19
Matrix:	SO - Soil	**Date Received:**	03/12/19
		Percent Solids:	91.4
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	69.3	1.5	mg/kg	1	03/20/19 18:29	JOO	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

ARCADIS Design & Consultancy for natural and built assets

PPG Industries

DATA QUALITY ASSESSMENT

Site 107 Fashionland

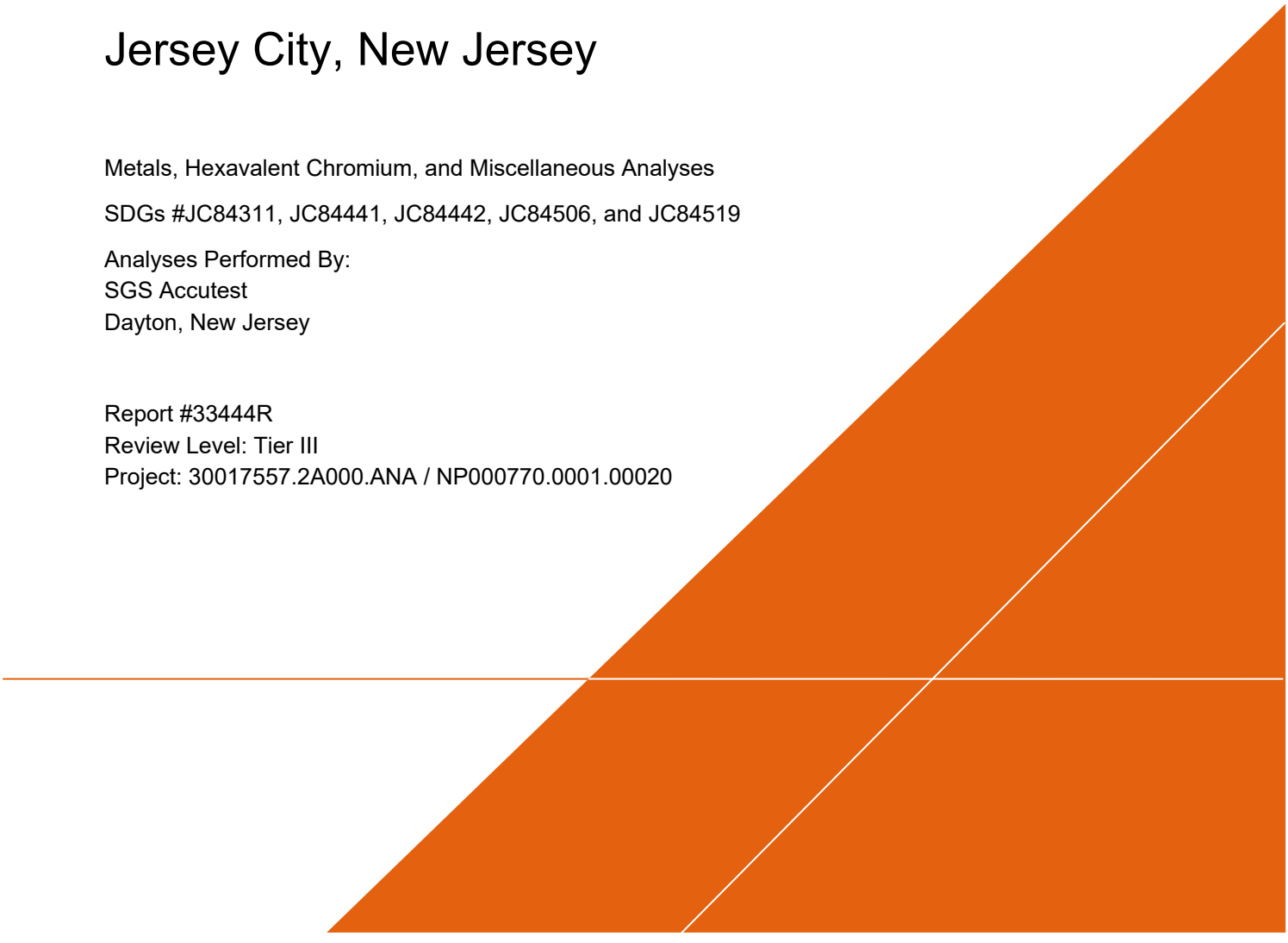
Jersey City, New Jersey

Metals, Hexavalent Chromium, and Miscellaneous Analyses

SDGs #JC84311, JC84441, JC84442, JC84506, and JC84519

Analyses Performed By:
SGS Accutest
Dayton, New Jersey

Report #33444R
Review Level: Tier III
Project: 30017557.2A000.ANA / NP000770.0001.00020



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Groups (SDGs) # JC84311, JC84441, JC84442, JC84506, and JC84519 for samples collected in association with the PPG Industries Site 107 Fashionland, Jersey City, New Jersey Site. The review was conducted as a Tier III evaluation and included review of data package completeness. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

SDG	Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis		
						Cr VI	MET	MISC
JC84311	FB(20190313)-A	JC84311-1	Water	3/13/2019		X	X	X
	BS-B0	JC84311-2	Soil	3/13/2019		X	X	X
JC84441	FB(20190314)-A	JC84441-1	Water	3/14/2019		X	X	X
	BS-BO-2	JC84441-2	Soil	3/14/2019		X	X	X
JC84442	FB(20190314)	JC84442-1	Water	3/14/2019		X	X	X
	BS-F18	JC84442-2	Soil	3/14/2019		X	X	X
JC84506	FB(20190315)	JC84506-1	Water	3/15/2019		X	X	X
	BS-F17	JC84506-2	Soil	3/15/2019		X	X	X
JC84519	FB(20190315)-A	JC84519-1	Water	3/15/2019		X	X	X
	SW-A8(2.0-2.5)	JC84519-2	Soil	3/15/2019		X	X	X
	SW-A8(4.0-4.5)	JC84519-3	Soil	3/15/2019		X	X	X
	SW-A8(6.0-6.5)	JC84519-4	Soil	3/15/2019		X	X	X
	108_M018W2	JC84519-5	Soil	3/15/2019		X	X	X
	108_M018W1	JC84519-6	Soil	3/15/2019		X	X	X
	SW-A7(0.0-0.5)	JC84519-7	Soil	3/15/2019		X	X	X
	SW-A7(2.0-2.5)	JC84519-8	Soil	3/15/2019		X	X	X
	SW-A7(4.0-4.5)	JC84519-9	Soil	3/15/2019		X	X	X
	DUP-04(20190315)RR	JC84519-10	Soil	3/15/2019	SW-A8(6.0-6.5)	X	X	X
	108_M018_E	JC84519-11	Soil	3/15/2019		X	X	X

Notes:

1. Metals include antimony, chromium, nickel, thallium, and vanadium. Trivalent chromium is reported by calculation (Chromium) – (Hexavalent Chromium).
2. Cr VI is hexavalent chromium.
3. Miscellaneous parameters include pH and redox potential.

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of QA or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

Note:
QA - Quality Assurance

INORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Methods 6010C, 7196A, and 9045D; Standard Methods (SM) 4500H+B and SM4500S2-A; Lloyd Kahn; and ASTM D1498-76 and D3872-86. Data were reviewed in accordance with USEPA Region 2 SOP HW-2b, Revision 15 (December 2012); New Jersey Division of Remediation Management and Response Standard Operating Procedure for Analytical Data Validation of Hexavalent Chromium (September 2009); New Jersey Department of Environmental Protection Data Quality Assessment and Data Usability Evaluation Technical Guidance (April 2014); Field Sampling Plan/Quality Assurance Project Plan, PPG Non-Residential and Residential Chromium Sites, Hudson County, New Jersey (AECOM, June 2010); and Arcadis Quality Assurance Project Plan – Addendum, Site 107 Fashionland, Jersey City, New Jersey (Arcadis, June 2018).

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and that it was already subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with the USEPA National Functional Guidelines:

- Concentration (C) Qualifiers
  - U The analyte was analyzed for but not detected. The associated value is the analyte instrument detection limit.
  - B The reported value was obtained from a reading less than the reporting limit (RL), but greater than or equal to the method detection limit (MDL).
- Quantitation (Q) Qualifiers
  - E The reported value is estimated due to the presence of interference.
  - N Spiked sample recovery is not within control limits.
  - * Duplicate analysis is not within control limits.
- Validation Qualifiers
  - J The analyte was positively identified; however, the associated numerical value is an estimated concentration only.
  - J+ The result is an estimated quantity, but the result may be biased high.
  - J- The result is an estimated quantity, but the result may be biased low.
  - UJ The analyte was not detected above the reporting limit. However, the reported limit is approximate and may or may not represent the actual limit of detection.
  - UB Analyte considered non-detect at the listed value due to associated blank contamination.
  - R The data are unusable. The sample results are rejected due to serious deficiencies in meeting Quality Control (QC) critieria. The analyte may or may not be present in the sample.

Two facts should be noted by all data users. First, the “R” flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. “R” values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

METALS ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 6010C	Water	180 days from collection to analysis	Preserved to a pH of less than 2; Cool to <6°C
	Soil	180 days from collection to analysis	Cool to <6°C

All samples were analyzed within the specified holding times.

2. Blank Contamination

Quality assurance (QA) blanks (i.e., method and rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank is calculated for QA blanks containing concentrations greater than the method detection limit (MDL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Analytes were not detected above the MDL in the associated blanks; therefore, detected sample results were not associated with blank contamination.

3. Calibration

Satisfactory instrument calibration is established to provide that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument's continuing performance is satisfactory.

3.1 Initial Calibration and Continuing Calibration

The correct number and type of standards were analyzed. The correlation coefficient of the initial calibration was greater than 0.998 and all initial calibration verification standard and continuing calibration verification standard recoveries were within control limits of 90% to 110%.

All continuing calibration verification standard recoveries were within the control limit.

3.2 Low-Level Calibration Verification

The low-level initial and continuing calibration check standard serves to verify the linearity of calibration of the analysis at the reporting limit.

All RL standard recoveries were within control limits of 70% to 130% (50% to 150% for antimony and thallium).

3.3 ICP Interference Control Sample (ICS)

The ICS verifies the laboratories interelement and background correction factors.

All ICS exhibited recoveries within the control limits of 80% to 120%.

4. Matrix Spike/Matrix Spike Duplicate (MS/MSD)/Laboratory Duplicate Analysis

MS/MSD and laboratory duplicate data are used to assess the precision and accuracy of the analytical method.

4.1 MS/MSD Analysis

All metal analytes must exhibit a percent recovery within the established acceptance limits of 75% to 125%. The MS/MSD recovery control limits do not apply for MS/MSD performed on sample locations where the analyte's concentration detected in the parent sample exceeds the MS/MSD concentration by a factor of four or greater.

SDGs #JC84311, JC84441, JC84442, and JC84506: The MS/MSD analysis was not performed using a sample from these SDGs.

SDG #JC84519: The MS/MSD analysis performed on sample location SW-A7(4.0-4.5) exhibited recoveries within the control limits with the exception of the analytes presented in the table below.

Sample Location	Analyte	MS Recovery	MSD Recovery
SW-A7(4.0-4.5)	Antimony	67.6%	62.5%

The criteria used to evaluate MS/MSD recoveries are presented in the following table. In the case of an MS/MSD deviation, the sample results are qualified. The qualifications are applied to all sample results associated with the sample preparation batch.

Control limit	Sample Result	Qualification
MS/MSD percent recovery 30% to 74%	Non-detect	UJ-
	Detect	J-
MS/MSD percent recovery < 30%	Non-detect	R
	Detect	J-
MS/MSD percent recovery > 125%	Non-detect	No Action
	Detect	J+

4.2 Laboratory Duplicate Analysis

The laboratory duplicate relative percent difference (RPD) criterion is applied when parent and duplicate sample concentrations are greater than or equal to 5 times the RL. A control limit of 20% for water matrices and 35% for soil matrices is applied when the criteria above is true. In the instance when the

parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of ± the RL is applied.

SDGs #JC84311, JC84441, JC84442, and JC84506: The laboratory duplicate analysis was not performed using a sample from these SDGs.

SDG #JC84519: MS/MSD analysis was performed in replacement of the laboratory duplicate analysis using sample SW-A7(4.0-4.5). The MS/MSD recoveries exhibited acceptable RPDs.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 50% for soil matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of three times the RL is applied for soil matrices.

Results for duplicate samples are summarized in the following table.

Sample ID/Duplicate ID	Analyte	Sample Result	Duplicate Result	RPD
SW-A8(6.0-6.5) / DUP-04(20190315)RR	Nickel	14.0	11.5	AC
	Vanadium	23.8	23.4	
	Chromium	16.6	15.6	6.2%
	Trivalent Chromium	16.2	15.2	6.4%

Notes:

AC = Acceptable

The differences in the results between the parent sample SW-A8(6.0-6.5) and field duplicate sample DUP-04(20190315)RR were acceptable.

6. Laboratory Control Sample (LCS) Analysis

The LCS analysis is used to assess the accuracy of the analytical method independent of matrix interferences. The analytes associated with the LCS analysis must exhibit a percent recovery between the control limits of 80% and 120%.

The LCS analysis exhibited recoveries and RPDs within the control limits.

7. Serial Dilution

The serial dilution analysis is used to assess if a significant physical or chemical interference exists due to sample matrix. Analytes exhibiting concentrations greater than 10 times the RL in the undiluted sample are evaluated to determine if matrix interference exists. These analytes are required to have less than a 10% difference (%D) between sample results from the undiluted (parent) sample and results associated with the same sample analyzed with a five-fold dilution.

SDGs #JC84311, JC84441, JC84442, and JC84506: The serial dilution analysis was not performed using a sample from these SDGs.

SDG #JC84519: The serial dilution analysis performed using sample SW-A7(4.0-4.5) exhibited %D within the control limits.

8. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR METALS

METALS: SW-846 6010C	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Inductively Coupled Plasma-Atomic Emission Spectrometry (ICP-AES)					
Tier II Validation					
Holding Times		X		X	
Reporting limits (units)		X		X	
Blanks					
A. Instrument Blanks		X		X	
B. Method Blanks		X		X	
C. Equipment/Field Blanks		X		X	
Laboratory Control Sample (LCS)		X		X	
Laboratory Control Sample Duplicate (LCSD)	X				X
LCS/LCSD Precision (RPD)	X				X
Matrix Spike (MS) %R		X	X		
Matrix Spike Duplicate (MSD) %R		X	X		
MS/MSD Precision (RPD)		X		X	
Field/Lab Duplicate (RPD)		X		X	
ICP Serial Dilution %D		X		X	
Total vs. Dissolved	X				X
Reporting Limit Verification		X		X	
Tier III Validation					
Initial Calibration Verification		X		X	
Continuing Calibration Verification		X		X	
CRDL Standard Recovery		X		X	
ICP Interference Check		X		X	
ICP-MS Internal Standards	X				X
Transcription/calculations acceptable		X		X	
Raw Data	X				X
Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%R Percent recovery

RPD Relative percent difference

%D Percent difference

HEXAVALENT CHROMIUM ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 7196A	Water	24 hours from collection to analysis	Cool to <6°C
SW-846 3060A/ 7196A	Soil	30 days from collection to extraction; 7 days from extraction to analysis	Cool to <6°C

All samples were analyzed within the specified holding times.

2. Blank Contamination

Quality assurance (QA) blanks (i.e., method and rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank is calculated for QA blanks containing concentrations greater than the method detection limit (MDL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Analytes were not detected above the MDL in the associated blanks; therefore, detected sample results were not associated with blank contamination.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

The correct number and type of standards were analyzed. The correlation coefficient of the initial calibration was greater than 0.995 and all calibration verification standard recoveries were within control limits of 90% to 110%.

4. Matrix Spike (MS)/Post-Digestion Spike (PDS)/Laboratory Duplicate Analysis

MS, PDS, and laboratory duplicate data are used to assess the precision and accuracy of the analytical method.

4.1 MS Analysis

Soluble and insoluble spike sample analyses are designed to provide information about the effect of the sample matrix on the digestion and measurement methodology. The insoluble spike is used to evaluate the dissolution during the digestion process. Hexavalent chromium must exhibit a percent recovery within

the established acceptance limits of 75% to 125% in both the soluble and insoluble spiked analyses. The control limits do not apply when the parent sample concentration exceeds the spike amount by a factor of four or greater.

SDGs #JC84311, JC84441, and JC84519: The MS analysis performed on sample locations BS-B0, BS-BO-2, and SW-A7(4.0-4.5) in association with the insoluble and soluble hexavalent chromium analysis exhibited recoveries within the control limits.

SDG # JC84442 and JC84506: The MS analysis was not performed using a sample from these SDGs.

4.2 Post-Digestion Spike (PDS) Analysis

The PDS analysis is designed to verify that neither a reducing condition nor a chemical interference is affecting the analysis. This is accomplished by analyzing a second aliquot of the pH-adjusted filtrate that has been spiked with hexavalent chromium. The PDS must exhibit a percent recovery within the method acceptance limits of 85% to 115%.

SDGs #JC84311, JC84441, and JC84519: The PDS analysis performed on sample locations BS-B0, BS-BO-2, and SW-A7(4.0-4.5) exhibited recoveries within the control limits.

SDG # JC84442 and JC84506: The laboratory duplicate analysis was not performed using a sample from these SDGs.

4.3 Laboratory Duplicate Analysis

The laboratory duplicate relative percent difference (RPD) criterion is applied when parent and duplicate sample concentrations are greater than or equal to four times the RL. A control limit of 20% is applied when the criteria above is true. In the instance when the parent and/or duplicate sample concentrations are less than or equal to four times the RL, a control limit of ± the RL is used.

SDG # JC84442 and JC84506: The laboratory duplicate analysis was not performed using a sample from these SDGs.

SDGs #JC84311, JC84441, and JC84519: All analytes associated with laboratory duplicate were within the control limit, with the exception of the analytes presented in the following table.

Sample Location	Analytes	Laboratory Duplicate RPD
BS-B0	Hexavalent Chromium	> ± RL
BS-BO-2	Hexavalent Chromium	38.3%
SW-A7(4.0-4.5)	Hexavalent Chromium	> ± RL

The criteria used to evaluate laboratory duplicate RPD are presented in the following table. In the case of a laboratory duplicate RPD deviation, the sample results are qualified. The qualifications are applied to all sample results associated with the sample preparation batch.

Sample Concentration	Control Limit	Sample Result	Qualification
Parent sample and/or laboratory duplicate sample result > four times the RL	> 20%	Non-detect	UJ
		Detect	J
Parent sample and/or laboratory duplicate sample result < four times the RL	± RL	Non-detect	UJ
		Detect	J

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 50% for soil matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of three times the RL is applied for soil matrices.

Results for duplicate samples are summarized in the following table.

Sample ID/Duplicate ID	Analyte	Sample Result	Duplicate Result	RPD
SW-A8(6.0-6.5) / DUP-04(20190315)RR	Hexavalent Chromium	0.46 U	0.45 U	AC

Notes:

AC = Acceptable

Hexavalent chromium was not detected in the parent sample SW-A8(6.0-6.5) and field duplicate sample DUP-04(20190315)RR.

6. Laboratory Control Sample (LCS) Analysis

The LCS analysis is used to assess the precision and accuracy of the analytical method independent of matrix interferences. The analytes associated with the LCS analysis must exhibit a percent recovery between the control limits of 80% and 120%.

The LCS analysis exhibited recoveries within the control limits.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR HEXAVALENT CHROMIUM

HEXAVALENT CHROMIUM: SW-846 7196A	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Spectrophotometer					
Tier II Validation					
Holding Times		X		X	
Reporting limits (units)		X		X	
Blanks					
A. Instrument Blanks		X		X	
B. Method Blanks		X		X	
C. Equipment/Field Blanks		X		X	
Laboratory Control Sample (LCS)		X		X	
Matrix Spike (MS) %R		X		X	
Matrix Spike Duplicate (MSD) %R	X				X
MS/MSD Precision (RPD)	X				X
Post Digestion Spike %R		X		X	
Field/Lab Duplicate (RPD)		X	X		
Dilution Factor		X		X	
Tier III Validation					
Initial calibration %RSD or correlation coefficient		X		X	
Continuing calibration %R		X		X	
Raw Data		X		X	
Transcription/calculation errors present		X		X	
Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%R Percent recovery

RPD Relative percent difference

%RSD Relative percent deviation

GENERAL CHEMISTRY ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
pH by SM4500H+B	Water	QAPP: 24 hours of receipt at laboratory	Cool to <6°C
pH by SW846 9045D	Soil	QAPP: 24 hours of receipt at laboratory	Cool to <6°C
Oxidation-Reduction Potential by ASTM D1498-76	Water	Not applicable	Cool to <6°C
Oxidation-Reduction Potential (Redox) by ASTM D1498-76	Soil	Measure immediately after creating leachate	Cool to <6°C

The analyses that exceeded the holding are presented in the following table.

Sample Locations	Method	Holding Time	Criteria
BS-BO-2 BS-F18	SW846 9045D	Analysis: 3 days	< 24 hours of receipt by laboratory
BS-B0		Analysis: 4 days	
BS-F17 SW-A8(2.0-2.5) SW-A8(4.0-4.5) SW-A8(6.0-6.5) 108_M018W2 108_M018W1 SW-A7(0.0-0.5) SW-A7(2.0-2.5) SW-A7(4.0-4.5) DUP-04(20190315)RR 108_M018_E		Analysis: 6 days	

Sample results were qualified as specified in the table below. All other holding times were met.

Criteria	Qualification	
	Detected Analytes	Non-detect Analytes
Analysis completed less than two times holding time	J	UJ
Analysis completed greater than two times holding time	J	R

2. Blank Contamination

Quality assurance (QA) blanks (i.e., method and rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank is calculated for QA blanks containing concentrations greater than the method detection limit (MDL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Method blank analysis is not applicable for Redox and pH analyses.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

The correct number and type of standards were analyzed. All buffer check results were within acceptance limits.

4. Laboratory Duplicate Analysis

Laboratory duplicate data are used to assess the precision of the analytical method. The laboratory duplicate relative percent difference (RPD) criterion is applied when parent and duplicate sample concentrations are greater than or equal to 5 times the RL. A control limit of 20% for water matrices and 35% for soil matrices is applied when the criteria above is true. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of ± the RL is applied.

SDGs #JC84311, JC84441, JC84442, and JC84506: The laboratory duplicate analysis was not performed using a sample from these SDGs.

SDG #JC84519: The laboratory duplicate analysis performed on sample location SW-A7(4.0-4.5) exhibited results within the control limit.

4. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 50% for soil matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of three times the RL is applied for soil matrices.

Results for duplicate samples are summarized in the following table.

Sample ID/Duplicate ID	Analyte	Sample Result	Duplicate Result	RPD
SW-A8(6.0-6.5) / DUP-04(20190315)RR	Redox	373	409	9.2%
	pH	7.17	7.25	1.1%

The differences in the results between the parent sample SW-A8(6.0-6.5) and field duplicate sample DUP-04(20190315)RR were acceptable.

6. Laboratory Control Sample (LCS) Analysis

The LCS analysis is used to assess the precision and accuracy of the analytical method independent of matrix interferences. The analytes associated with the LCS analysis must exhibit a percent recovery between the control limits of 80% and 120%.

LCS results for redox potential, pH, and sulfide screen were not reported in the analytical report.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR GENERAL CHEMISTRY

General Chemistry: SM4500H+B, SW846 9045D, ASTM D1498-76	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Miscellaneous Instrumentation					
Tier II Validation					
Holding times		X	X		
Reporting limits (units)		X		X	
Blanks					
A. Instrument Blanks		X		X	
B. Method blanks		X		X	
C. Equipment blanks		X		X	
Laboratory Control Sample (LCS) %R		X		X	
Laboratory Control Sample Duplicate (LCSD) %R	X				X
LCS/LCSD Precision (RPD)	X				X
Matrix Spike (MS) %R	X				X
Matrix Spike Duplicate (MSD) %R	X				X
MS/MSD Precision (RPD)	X				X
Field/Lab Duplicate (RPD)		X		X	
Dilution Factor		X		X	
Tier III Validation					
Initial calibration %RSD or correlation coefficient	X				X
Continuing calibration %R	X				X
Raw Data		X		X	
Transcription/calculation errors present		X		X	
Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%R Percent recovery

RPD Relative percent difference

VALIDATION PERFORMED BY: Jennifer Singer

SIGNATURE: 

DATE: July 15, 2019

PEER REVIEW: Dennis Capria

DATE: July 18, 2019

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

SGS

50
FB

CHAIN OF CUSTODY

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Page 1 of 1

C

FED-EX Tracking #:
Bottle Order Control #:
SGS Quote #:
SGS Job #: JC84311

Client / Reporting Information

Company Name: Arcadis
Street Address: 10 Friends Lane
City: Newtown State: PA Zip: 18940
Project Contact: Krista Mastrocola E-mail:
Phone #: 610.755.7080
Sampler(s) Name(s): Christina Ciletti Phone #: 201-264-8665

Project Information

Project Name: PPG Jersey City Site 107
Street: 18 Chapel Ave
City: Jersey City State: NJ
Project #: NP000770.0003
Client Purchase Order #:
Project Manager: Jean McLaughlin

Billing Information (if different from Report to)
Company Name:
Street Address:
City: State: Zip:
Attention:

Requested Analysis

Matrix Codes: DW - Drinking Water; GW - Ground Water; WW - Water; SW - Surface Water; SO - Soil; SL - Sludge; SED - Sediment; OI - Oil; LIQ - Other Liquid; AIR - Air; SOL - Other Solid; WP - Wipe; FB - Field Blank; EB - Equipment Blank; RB - Rinse Blank; TB - Trip Blank

SGS Sample #	Field ID / Point of Collection	MEOH/DI Vial #	Collection Date	Collection Time	Sampled by	Grab (G) Comp (C)	Matrix	# of bottles	HCl	NaOH	HNO_3	H_2SO_4	NONE	DI Water	MEOH	ENCORE	Total Chromium	Hexavalent Chromium	Trivalent Chromium	Antimony	Vanadium	Thallium	Nickel	LAB USE ONLY
1	FB(20190313)-A		3/13/19	0810	CC	G	FB	2			1		1				X	X	X	X	X	X	X	
2	BS-B0		3/13/19	1045	CC	G	SO	1					1				X	X	X	X	X	X	X	A10
																								G34
																								D6

Turn Around Time (Business Days)

Approved By (SGS PM): / Date:

- [ ] 10 Business Days
- [ ] 5 Business Days
- [ ] 3 Business Days*
- [x] 2 Business Days*
- [ ] 1 Business Day*
- [ ] Other

All data available via Lablink
* Approval needed for 1-3 Business Day TAT

Deliverable

- [ ] Commercial "A" (Level 1)
- [ ] Commercial "B" (Level 2)
- [ ] NJ Reduced (Level 3)
- [ ] Full Tier I (Level 4)
- [ ] Commercial "C"
- [ ] NJ DKQP
- [ ] NYASP Category A
- [ ] NYASP Category B
- [ ] MA MCP Criteria
- [ ] CT RCP Criteria
- [ ] State Forms
- [x] EDD Format Equis
- [ ] DOD-QSM5

Commercial "A" = Results only; Commercial "B" = Results + QC Summary
Commercial "C" = Results + QC Summary + Partial Raw data

Comments / Special Instructions

INITIAL ASESSMENT 3B
LABEL VERIFICATION

http://www.sgs.com/en/terms-and-conditions

Sample Custody must be documented below each time samples change possession, including courier delivery.

Relinquished by:	Date / Time:	Received By:	Relinquished By:	Date / Time:	Received By:
1 C. Ciletti	3/13/19 1945	1 TSchm 3/13/19 2330	2 TSchm 3/13/19	1641	2 [signature]
3		3	4		4
5		5	Custody Seal # 18938	☐ Intact ☐ Not intact	Preserved where applicable ☐ Absent; Therm. ID:; On Ice ☒; Cooler Temp. °C

CIP

3.4

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JC84311: Chain of Custody
Page 1 of 2

Report of Analysis

Client Sample ID:	FB(20190313)-A		
Lab Sample ID:	JC84311-1	**Date Sampled:**	03/13/19
Matrix:	AQ - Field Blank Soil	**Date Received:**	03/13/19
		Percent Solids:	n/a
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	< 0.010	0.010	mg/l	1	03/13/19 18:20	JOO	SW846 7196A
Redox Potential Vs H2	483		mv	1	03/18/19 12:22	RI	ASTM D1498-76
pH [a]	5.03		su	1	03/13/19 17:00	DDH	SM4500H+ B-11

(a) Sample received out of holding time for pH analysis.

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-B0		
Lab Sample ID:	JC84311-2	**Date Sampled:**	03/13/19
Matrix:	SO - Soil	**Date Received:**	03/13/19
		Percent Solids:	87.7
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	1.5 J	0.46	mg/kg	1	03/27/19 16:46	RI	SW846 3060A/7196A
Redox Potential Vs H2	314		mv	1	03/17/19 15:59	EB	ASTM D1498-76M
Solids, Percent	87.7		%	1	03/14/19 14:00	BG	SM2540 G 18TH ED MOD
pH	8.05 J		su	1	03/17/19 15:59	EB	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID: FB(20190313)-A
Lab Sample ID: JC84311-1A
Matrix: AQ - Field Blank Soil
Project: PPG Site 107, 18 Chapel Avenue, Jersey City, NJ

Date Sampled: 03/13/19
Date Received: 03/13/19
Percent Solids: n/a

Total Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 6.0	6.0	ug/l	1	03/14/19	03/14/19	ND	SW846 6010D [1]	SW846 3010A [2]
Chromium	< 10	10	ug/l	1	03/14/19	03/14/19	ND	SW846 6010D [1]	SW846 3010A [2]
Nickel	< 10	10	ug/l	1	03/14/19	03/14/19	ND	SW846 6010D [1]	SW846 3010A [2]
Thallium	< 10	10	ug/l	1	03/14/19	03/14/19	ND	SW846 6010D [1]	SW846 3010A [2]
Vanadium	< 50	50	ug/l	1	03/14/19	03/14/19	ND	SW846 6010D [1]	SW846 3010A [2]

(1) Instrument QC Batch: MA46306
(2) Prep QC Batch: MP13124

RL = Reporting Limit

Report of Analysis

Client Sample ID:	FB(20190313)-A		
Lab Sample ID:	JC84311-1A	**Date Sampled:**	03/13/19
Matrix:	AQ - Field Blank Soil	**Date Received:**	03/13/19
		Percent Solids:	n/a
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	< 0.020	0.020	mg/l	1	03/14/19 15:14	ND	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-B0		
Lab Sample ID:	JC84311-2A	**Date Sampled:**	03/13/19
Matrix:	SO - Soil	**Date Received:**	03/13/19
		Percent Solids:	87.7
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 2.2	2.2	mg/kg	1	03/14/19	03/14/19	ND	SW846 6010D [1]	SW846 3050B [2]
Chromium	17.8	1.1	mg/kg	1	03/14/19	03/14/19	ND	SW846 6010D [1]	SW846 3050B [2]
Nickel	15.0	4.5	mg/kg	1	03/14/19	03/14/19	ND	SW846 6010D [1]	SW846 3050B [2]
Thallium [a]	< 2.2	2.2	mg/kg	2	03/14/19	03/14/19	ND	SW846 6010D [1]	SW846 3050B [2]
Vanadium [a]	24.3	11	mg/kg	2	03/14/19	03/14/19	ND	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA46306
(2) Prep QC Batch: MP13116

(a) Elevated detection limit due to dilution required for high interfering element.

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-B0		
Lab Sample ID:	JC84311-2A	**Date Sampled:**	03/13/19
Matrix:	SO - Soil	**Date Received:**	03/13/19
		Percent Solids:	87.7
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	16.3	1.6	mg/kg	1	03/27/19 16:46	RI	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

SO
FB

CHAIN OF CUSTODY

Page 1 of 1

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www.sgs.com/ehsusa

FED-EX Tracking #: | Bottle Order Control #:
SGS Quote #: | SGS Job #: JC84441

Client / Reporting Information	Project Information	Billing Information (If different from Report to)
Company Name: Arcadis	Project Name: PPG Jersey City Site 107	Company Name:
Street Address: 10 Friends Lane, Suite 100	Street: 10 Chapel Avenue	Street Address:
City / State / Zip: Newtown, PA 18940	City / State: Jersey City NJ	City / State / Zip:
Project Contact / E-mail: Matthew Bell	Project #: NP000770.0003	
Phone #: 616-755-7080	Client Purchase Order #	
Sampler(s) Name(s) / Phone #: C. Citelli	Project Manager: Jim McCaughlin, Jr.	Attention:

Requested Analysis

SGS Sample #	Field ID / Point of Collection	MEOH/DI Vial #	Collection Date	Collection Time	Sampled by	Grab (G) / Comp (C)	Matrix	# of bottles	Number of preserved Bottles: HCl	NaOH	HNO3	H2SO4	NONE	DI Water	MEOH	ENCORE	Total Chromium	Hexavalent Chromium	Trivalent Chromium	Antimony	Thallium	Vanadium	Nickel	LAB USE ONLY
1	FB(20190314)-A		3/14/19	1330	CC	G	FB	2				1	1				X	X	X	X	X	X	X	G24
2	BS-B0-2		3/14/19	1315	CC	G	SO	1					1				X	X	X	X	X	X	X	A9 B25

Matrix Codes: DW - Drinking Water; GW - Ground Water; WW - Water; SW - Surface Water; SO - Soil; SL - Sludge; SED-Sediment; OI - Oil; LIQ - Other Liquid; AIR - Air; SOL - Other Solid; WP - Wipe; FB - Field Blank; EB-Equipment Blank; RB - Rinse Blank; TB - Trip Blank

Turn Around Time (Business Days)
Approved By (SGS PM): / Date:
- [ ] 10 Business Days
- [ ] 5 Business Days
- [ ] 3 Business Days*
- [x] 2 Business Days*
- [ ] 1 Business Day*
- [ ] Other
All data available via Labink
* Approval needed for 1-3 Business Day TAT

Deliverable
- [ ] Commercial "A" (Level 1)
- [ ] Commercial "B" (Level 2)
- [ ] NJ Reduced (Level 3)
- [ ] Full Tier I (Level 4)
- [ ] Commercial "C"
- [ ] NJ DKQP
- [ ] NYASP Category A
- [ ] NYASP Category B
- [ ] MA MCP Criteria
- [ ] CT RCP Criteria
- [ ] State Forms
- [x] EDD Format EQuIS
- [ ] DOD-QSM5

Commercial "A" = Results only; Commercial "B" = Results + QC Summary
Commercial "C" = Results + QC Summary + Partial Raw data

Comments / Special Instructions
INITIAL ASESSMENT 3A (1)
LABEL VERIFICATION
http://www.sgs.com/en/terms-and-conditions

Sample Custody must be documented below each time samples change possession, including courier delivery.

	Relinquished by:	Date / Time:	Received By:	Relinquished By:	Date / Time:	Received By:
1		3/14/19 1433	1	3-14-19 19:55	3-14-19 1855	2
3			3	4		4
5			5	Custody Seal # 25090	Intact / Not Intact	Preserved where applicable: Absent / Therm. ID: On Ice: X Cooler Temp. °C: 2.3C

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JC84441: Chain of Custody
Page 1 of 2

Report of Analysis

Client Sample ID:	FB(20190314)-A		
Lab Sample ID:	JC84441-1	**Date Sampled:**	03/14/19
Matrix:	AQ - Field Blank Soil	**Date Received:**	03/14/19
		Percent Solids:	n/a
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	< 0.010	0.010	mg/l	1	03/15/19	JOO	SW846 7196A
Redox Potential Vs H2	516		mv	1	03/18/19 12:25	RI	ASTM D1498-76
pH [a]	5.41		su	1	03/14/19 20:08	JP	SM4500H+ B-11

(a) Sample received out of holding time for pH analysis.

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-BO-2		
Lab Sample ID:	JC84441-2	**Date Sampled:**	03/14/19
Matrix:	SO - Soil	**Date Received:**	03/14/19
		Percent Solids:	83.5
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	10.9 J	0.48	mg/kg	1	03/29/19 16:05	RI	SW846 3060A/7196A
Redox Potential Vs H2	385		mv	1	03/17/19 16:25	EB	ASTM D1498-76M
Solids, Percent	83.5		%	1	03/17/19 12:35	BG	SM2540 G 18TH ED MOD
pH	8.32 J		su	1	03/17/19 16:16	EB	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID: FB(20190314)-A
Lab Sample ID: JC84441-1A
Matrix: AQ - Field Blank Soil
Project: PPG Site 107, 18 Chapel Avenue, Jersey City, NJ

Date Sampled: 03/14/19
Date Received: 03/14/19
Percent Solids: n/a

Total Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 6.0	6.0	ug/l	1	03/15/19	03/15/19	ND	SW846 6010D [1]	SW846 3010A [2]
Chromium	< 10	10	ug/l	1	03/15/19	03/15/19	ND	SW846 6010D [1]	SW846 3010A [2]
Nickel	< 10	10	ug/l	1	03/15/19	03/15/19	ND	SW846 6010D [1]	SW846 3010A [2]
Thallium	< 10	10	ug/l	1	03/15/19	03/15/19	ND	SW846 6010D [1]	SW846 3010A [2]
Vanadium	< 50	50	ug/l	1	03/15/19	03/15/19	ND	SW846 6010D [1]	SW846 3010A [2]

(1) Instrument QC Batch: MA46314
(2) Prep QC Batch: MP13154

RL = Reporting Limit

Report of Analysis

Client Sample ID:	FB(20190314)-A		
Lab Sample ID:	JC84441-1A	**Date Sampled:**	03/14/19
Matrix:	AQ - Field Blank Soil	**Date Received:**	03/14/19
		Percent Solids:	n/a
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	< 0.020	0.020	mg/l	1	03/15/19 16:50	ND	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-BO-2		
Lab Sample ID:	JC84441-2A	**Date Sampled:**	03/14/19
Matrix:	SO - Soil	**Date Received:**	03/14/19
		Percent Solids:	83.5
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 2.3	2.3	mg/kg	1	03/15/19	03/15/19	ND	SW846 6010D [1]	SW846 3050B [2]
Chromium	234	1.2	mg/kg	1	03/15/19	03/15/19	ND	SW846 6010D [1]	SW846 3050B [2]
Nickel	34.7	4.6	mg/kg	1	03/15/19	03/15/19	ND	SW846 6010D [1]	SW846 3050B [2]
Thallium	< 1.2	1.2	mg/kg	1	03/15/19	03/15/19	ND	SW846 6010D [1]	SW846 3050B [2]
Vanadium	49.6	5.8	mg/kg	1	03/15/19	03/15/19	ND	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA46314
(2) Prep QC Batch: MP13116

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-BO-2		
Lab Sample ID:	JC84441-2A	**Date Sampled:**	03/14/19
Matrix:	SO - Soil	**Date Received:**	03/14/19
		Percent Solids:	83.5
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	223	1.7	mg/kg	1	03/29/19 16:05	RI	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

CHAIN OF CUSTODY

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www.sgs.com/ehsusa

Page 1 of 1

FED-EX Tracking #: | Bottle Order Control #:
SGS Quote #: | SGS Job #: JC84442

Client / Reporting Information

Company Name: Arcadis
Street Address: 10 Friends Lane, Suite 100
City: Newtown State: PA Zip: 18940
Project Contact: Matthew Bell E-mail:
Phone #: 610-755-7080
Sampler(s) Name(s): C. Citelli Phone #:

Project Information

Project Name: PPG Site 107 (Jersey City)
Street: 10 Chapel Ave Ext
City: Jersey City State: NJ
Project #: NP000770.0003
Client Purchase Order #:
Project Manager: Jim McLaughlin, JR

Billing Information (if different from Report to)

Company Name:
Street Address:
City: State: Zip:
Attention:

Requested Analysis

Matrix Codes: DW - Drinking Water; GW - Ground Water; WW - Water; SW - Surface Water; SO - Soil; SL- Sludge; SED-Sediment; OI - Oil; LIQ - Other Liquid; AIR - Air; SOL - Other Solid; WP - Wipe; FB - Field Blank; EB-Equipment Blank; RB - Rinse Blank; TB - Trip Blank

SGS Sample #	Field ID / Point of Collection	MEOH/DI Vial #	Collection Date	Collection Time	Sampled by	Grab (G) Comp (C)	Matrix	# of bottles	HCl	NaOH	HNO3	H2SO4	NONE	DI Water	MEOH	ENCORE	Total Chromium	Hexavalent Chromium	Trivalent Chromium	Antimony	Thallium	Vanadium	Nickel	LAB USE ONLY
1	FB(20190714)		3/14/19	1430	CC	G	FB	2			1		1				X	X	X	X	X	X	X	
2	BS-F18		3/14/19	1415	CC	G	SO	1					1				X	X	X	X	X	X	X	A9 G24

Turn Around Time (Business Days)

Approved By (SGS PM): / Date:

- [ ] 10 Business Days
- [ ] 5 Business Days
- [ ] 3 Business Days*
- [x] 2 Business Days*
- [ ] 1 Business Day*
- [ ] Other

All data available via Labink

* Approval needed for 1-3 Business Day TAT

Deliverable

- [ ] Commercial "A" (Level 1)
- [ ] Commercial "B" (Level 2)
- [ ] NJ Reduced (Level 3)
- [ ] Full Tier I (Level 4)
- [ ] Commercial "C"
- [ ] NJ DKQP
- [ ] NYASP Category A
- [ ] NYASP Category B
- [ ] MA MCP Criteria
- [ ] CT RCP Criteria
- [ ] State Forms
- [x] EDD Format EQUIS
- [ ] DOD-QSM5

Commercial "A" = Results only; Commercial "B" = Results + QC Summary
Commercial "C" = Results + QC Summary + Partial Raw data

Comments / Special Instructions

INITIAL ASESSMENT 3A
LABEL VERIFICATION

http://www.sgs.com/en/terms-and-conditions

Sample Custody must be documented below each time samples change possession, including courier delivery.

	Relinquished by:	Date / Time:	Received By:	Relinquished By:	Date / Time:	Received By:
1		3/14/19 1433	1	2	3-14-19 1855	2
3			3	4		4
5			5	Custody Seal # 25090	Intact / Not intact	Preserved where applicable: Absent / Therm. ID: On Ice: A	Cooler Temp. °C: 2.3C

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Report of Analysis

Client Sample ID:	FB(20190314)		
Lab Sample ID:	JC84442-1	**Date Sampled:**	03/14/19
Matrix:	AQ - Field Blank Soil	**Date Received:**	03/14/19
		Percent Solids:	n/a
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	< 0.010	0.010	mg/l	1	03/15/19	JOO	SW846 7196A
Redox Potential Vs H2	520		mv	1	03/18/19 12:30	RI	ASTM D1498-76
pH [a]	5.21		su	1	03/14/19 20:10	JP	SM4500H+ B-11

(a) Sample received out of holding time for pH analysis.

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-F18		
Lab Sample ID:	JC84442-2	**Date Sampled:**	03/14/19
Matrix:	SO - Soil	**Date Received:**	03/14/19
		Percent Solids:	67.6
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	< 0.59	0.59	mg/kg	1	03/22/19 16:32	RI	SW846 3060A/7196A
Redox Potential Vs H2	88.4		mv	1	03/17/19 16:32	EB	ASTM D1498-76M
Solids, Percent	67.6		%	1	03/17/19 12:35	BG	SM2540 G 18TH ED MOD
pH	7.42 J		su	1	03/17/19 16:32	EB	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID: FB(20190314)
Lab Sample ID: JC84442-1A
Matrix: AQ - Field Blank Soil
Project: PPG Site 107, 18 Chapel Avenue, Jersey City, NJ

Date Sampled: 03/14/19
Date Received: 03/14/19
Percent Solids: n/a

Total Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 6.0	6.0	ug/l	1	03/15/19	03/15/19	ND	SW846 6010D [1]	SW846 3010A [2]
Chromium	< 10	10	ug/l	1	03/15/19	03/15/19	ND	SW846 6010D [1]	SW846 3010A [2]
Nickel	< 10	10	ug/l	1	03/15/19	03/15/19	ND	SW846 6010D [1]	SW846 3010A [2]
Thallium	< 10	10	ug/l	1	03/15/19	03/15/19	ND	SW846 6010D [1]	SW846 3010A [2]
Vanadium	< 50	50	ug/l	1	03/15/19	03/15/19	ND	SW846 6010D [1]	SW846 3010A [2]

(1) Instrument QC Batch: MA46314
(2) Prep QC Batch: MP13154

RL = Reporting Limit

Report of Analysis

Client Sample ID:	FB(20190314)		
Lab Sample ID:	JC84442-1A	**Date Sampled:**	03/14/19
Matrix:	AQ - Field Blank Soil	**Date Received:**	03/14/19
		Percent Solids:	n/a
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	< 0.020	0.020	mg/l	1	03/15/19 16:55	ND	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID: BS-F18
Lab Sample ID: JC84442-2A
Matrix: SO - Soil
Project: PPG Site 107, 18 Chapel Avenue, Jersey City, NJ

Date Sampled: 03/14/19
Date Received: 03/14/19
Percent Solids: 67.6

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 3.0	3.0	mg/kg	1	03/15/19	03/15/19	ND	SW846 6010D [1]	SW846 3050B [2]
Chromium	23.8	1.5	mg/kg	1	03/15/19	03/15/19	ND	SW846 6010D [1]	SW846 3050B [2]
Nickel	20.3	5.9	mg/kg	1	03/15/19	03/15/19	ND	SW846 6010D [1]	SW846 3050B [2]
Thallium	< 1.5	1.5	mg/kg	1	03/15/19	03/15/19	ND	SW846 6010D [1]	SW846 3050B [2]
Vanadium	28.3	7.4	mg/kg	1	03/15/19	03/15/19	ND	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA46314
(2) Prep QC Batch: MP13116

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-F18		
Lab Sample ID:	JC84442-2A	**Date Sampled:**	03/14/19
Matrix:	SO - Soil	**Date Received:**	03/14/19
		Percent Solids:	67.6
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	23.8	2.1	mg/kg	1	03/22/19 16:32	RI	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

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FED-EX Tracking #: | Bottle Order Control #: AK-011719-182
SGS Quote #: | SGS Job #: JC84506

Client / Reporting Information

Company Name: Arcadis
Street Address: 10 Friends Lane Suite 100
City: Newtown State: PA Zip: 18940
Project Contact: Matthew Bell E-mail:
Phone #: 610-255-7080 Fax #:
Sampler(s) Name(s): D. Hilinski; Chris Cote Phone #:

Project Information

Project Name: PPG Site 107 (Jersey City)
Street: 18 Chapel Avenue
City: Jersey City State: NJ
Project #: NP000770.0003
Client Purchase Order #:
Project Manager: Jim McLaughlin, Jr.

Billing Information (if different from Report to)

Company Name:
Street Address:
City: State: Zip:
Attention:

Requested Analysis (see TEST CODE sheet)

Lab Sample #	Field ID / Point of Collection	MEOH/DI Vial #	Collection Date	Collection Time	Sampled by	Matrix	# of bottles	Number of preserved bottles: HCl	NaOH	HNO3	H2SO4	NONE	DI Water	MEOH	ENCORE	Total Chromium	Trivalent Chromium	Hexavalent Chromium	Antimony	Nickel	Thallium	Vanadium	LAB USE ONLY
1	FB(20190315)		3/15/19	1130	CC	FB	2			1		1				X	X	X	X	X	X	X	A9
2	BS-F17		3/15/19	0945	DH	SO	1					1				X	X	X	X	X	X	X	G44
																							B8

Matrix Codes: DW - Drinking Water; GW - Ground Water; WW - Water; SW - Surface Water; SO - Soil; SL- Sludge; SED-Sediment; OI - Oil; LIQ - Other Liquid; AIR - Air; SOL - Other Solid; WP - Wipe; FB-Field Blank; EB-Equipment Blank; RB- Rinse Blank; TB-Trip Blank

Turnaround Time (Business days)

Approved by (SGS Project Manager)/Date:

- [ ] Std. 10 Business Days
- [ ] 5 Day RUSH
- [ ] 3 Day RUSH
- [X] 2 Day RUSH
- [ ] 1 Day RUSH
- [ ] other

Emergency & Rush T/A data available via LabLink

Data Deliverable Information

- [ ] Commercial "A" (Level 1)
- [ ] Commercial "B" (Level 2)
- [ ] FULLT1 (Level 3+4)
- [ ] NJ Reduced
- [ ] Commercial "C"
- [ ] NJ Data of Known Quality Protocol Reporting
- [ ] NYASP Category A
- [ ] NYASP Category B
- [ ] State Forms
- [X] EDD Format EQuIS
- [ ] Other

Commercial "A" = Results Only; Commercial "B" = Results + QC Summary
NJ Reduced = Results + QC Summary + Partial Raw data

Comments / Special Instructions

INITIAL ASESSMENT JK 3A

LABEL VERIFICATION

Sample inventory is verified upon receipt in the Laboratory

Sample Custody must be documented below each time samples change possession, including courier delivery.

	Relinquished by Sampler:	Date Time:	Received By:	Relinquished By:	Date Time:	Received By:
1		3/15/19 1410	Robert Chambers	Robert Chambers	3.15.19 1557	
2	Relinquished by Sampler:	Date Time:	Received By:	Relinquished By:	Date Time:	Received By:
3						
4	Relinquished by:	Date Time:	Received By:	Custody Seal # 23214	Intact / Not intact	Preserved where applicable
5						On Ice: I G Cooler Temp: 3.2°C

Form:SM088-03C (revised 2/12/18)

http://www.sgs.com/en/terms-and-conditions.

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JC84506: Chain of Custody
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Report of Analysis

Client Sample ID:	FB(20190315)		
Lab Sample ID:	JC84506-1	**Date Sampled:**	03/15/19
Matrix:	AQ - Field Blank Soil	**Date Received:**	03/15/19
		Percent Solids:	n/a
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	< 0.010	0.010	mg/l	1	03/15/19 22:33	JOO	SW846 7196A
Redox Potential Vs H2	542		mv	1	03/18/19 00:15	EB	ASTM D1498-76
pH [a]	5.34		su	1	03/14/19 17:16	JP	SM4500H+ B-11

(a) Sample received out of holding time for pH analysis.

RL = Reporting Limit

Report of Analysis

Client Sample ID: BS-F17
Lab Sample ID: JC84506-2
Matrix: SO - Soil
Project: PPG Site 107, 18 Chapel Avenue, Jersey City, NJ

Date Sampled: 03/15/19
Date Received: 03/15/19
Percent Solids: 73.7

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	< 0.54	0.54	mg/kg	1	03/22/19 16:30	RI	SW846 3060A/7196A
Redox Potential Vs H2	241		mv	1	03/21/19 22:52	EB	ASTM D1498-76M
Solids, Percent	73.7		%	1	03/17/19 12:35	BG	SM2540 G 18TH ED MOD
pH	6.54 J		su	1	03/21/19 22:04	EB	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID: FB(20190315)
Lab Sample ID: JC84506-1A
Matrix: AQ - Field Blank Soil
Project: PPG Site 107, 18 Chapel Avenue, Jersey City, NJ

Date Sampled: 03/15/19
Date Received: 03/15/19
Percent Solids: n/a

Total Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 6.0	6.0	ug/l	1	03/16/19	03/18/19	GT	SW846 6010D [1]	SW846 3010A [2]
Chromium	< 10	10	ug/l	1	03/16/19	03/18/19	GT	SW846 6010D [1]	SW846 3010A [2]
Nickel	< 10	10	ug/l	1	03/16/19	03/18/19	GT	SW846 6010D [1]	SW846 3010A [2]
Thallium	< 10	10	ug/l	1	03/16/19	03/18/19	GT	SW846 6010D [1]	SW846 3010A [2]
Vanadium	< 50	50	ug/l	1	03/16/19	03/18/19	GT	SW846 6010D [1]	SW846 3010A [2]

(1) Instrument QC Batch: MA46320
(2) Prep QC Batch: MP13173

RL = Reporting Limit

Report of Analysis

Client Sample ID:	FB(20190315)		
Lab Sample ID:	JC84506-1A	**Date Sampled:**	03/15/19
Matrix:	AQ - Field Blank Soil	**Date Received:**	03/15/19
		Percent Solids:	n/a
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	< 0.020	0.020	mg/l	1	03/18/19 14:02	GT	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-F17		
Lab Sample ID:	JC84506-2A	**Date Sampled:**	03/15/19
Matrix:	SO - Soil	**Date Received:**	03/15/19
		Percent Solids:	73.7
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 2.7	2.7	mg/kg	1	03/15/19	03/18/19	GT	SW846 6010D [1]	SW846 3050B [2]
Chromium	16.2	1.4	mg/kg	1	03/15/19	03/18/19	GT	SW846 6010D [1]	SW846 3050B [2]
Nickel	13.6	5.5	mg/kg	1	03/15/19	03/18/19	GT	SW846 6010D [1]	SW846 3050B [2]
Thallium	< 1.4	1.4	mg/kg	1	03/15/19	03/18/19	GT	SW846 6010D [1]	SW846 3050B [2]
Vanadium	22.7	6.9	mg/kg	1	03/15/19	03/18/19	GT	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA46320
(2) Prep QC Batch: MP13172

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-F17		
Lab Sample ID:	JC84506-2A	**Date Sampled:**	03/15/19
Matrix:	SO - Soil	**Date Received:**	03/15/19
		Percent Solids:	73.7
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	16.2	1.9	mg/kg	1	03/22/19 16:30	RI	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

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FED-EX Tracking #:
SGS Quote #:
Bottle Order Control #: AR-03819-108
SGS Job #: JC84519

Client / Reporting Information

Company Name: ANCHOR QEA
Street Address: 10 FRIENDS LANE, SUITE 100
City: NEWTOWN State: PA Zip: 18940
Project Contact: Matthew Bell E-mail:
Phone #: 610-755-7060 Fax #:
Sampler(s) Name(s): C. Cifelli Phone #: 201.264.8065

Project Information

Project Name: PPG SITE 107 (Jersey City)
Street: 18 Chapel Avenue
City: Jersey City State: NJ
Project #: NF000770.0003
Client Purchase Order #:
Project Manager: Tim McLoughlin JR.

Billing Information (if different from Report to)

Company Name:
Street Address:
City: State: Zip:
Attention:

Requested Analysis (see TEST CODE sheet)

Matrix Codes: DW - Drinking Water; GW - Ground Water; WW - Water; SW - Surface Water; SO - Soil; SL - Sludge; SED - Sediment; OI - Oil; LIQ - Other Liquid; AIR - Air; SOL - Other Solid; WP - Wipe; FB - Field Blank; EB - Equipment Blank; RB - Rinse Blank; TB - Trip Blank

Lab Sample #	Field ID / Point of Collection	MEOH/DI Vial #	Collection Date	Collection Time	Sampled by	Matrix	# of bottles	Number of preserved bottles: HCl	NaOH	HNO3	H2SO4	NONE	DI Water	MEOH	ENCORE	Total Chromium	Trivalent Chromium	Hexavalent Chromium	Antimony	Nickel	Thallium	Vanadium	LAB USE ONLY
1	FB(20190315) - A		3/15/19	1115	CC	FB	2			1		1				X	X	X	X	X	X	X	C6
2	SW-A8 (2.0-2.5)		3/15/19	0920	CC	SO	1					1				X	X	X	X	X	X	X	A9
3	SW-A8 (4.0-4.0)		3/15/19	0925	CC	SO	1					1				X	X	X	X	X	X	X	G44
4	SW-A8 (6.0-6.0)		3/15/19	0930	CC	SO	1					1				X	X	X	X	X	X	X	
5	108-MW18W2		3/15/19	0935	CC	SO	1					1				X	X	X	X	X	X	X	
6	108-MW18W1		3/15/19	0940	CC	SO	1					1				X	X	X	X	X	X	X	
7	SW-A7(0.0-0.5)		3/15/19	0945	CC	SO	1					1				X	X	X	X	X	X	X	
8	SW-A7(2.0-2.5)		3/15/19	0950	CC	SO	1					1				X	X	X	X	X	X	X	
9	SW-A7(4.0-4.5)		3/15/19	0955	CC	SO	1					1				X	X	X	X	X	X	X	
	SW-A7(4.0-4.5) MS		3/15/19	0955	CC	SO	1					1				X	X	X	X	X	X	X	
10	DUP-04(20190315) RR		3/15/19	—	CC	SO	1					1				X	X	X	X	X	X	X	

Turnaround Time (Business days)

- [ ] Std. 10 Business Days
- [ ] 5 Day RUSH
- [ ] 3 Day RUSH
- [x] 2 Day RUSH
- [ ] 1 Day RUSH
- [ ] other

Approved by (SGS Project Manager)/Date:

Emergency & Rush T/A data available via LabLink

Data Deliverable Information

- [ ] Commercial "A" (Level 1)
- [ ] Commercial "B" (Level 2)
- [ ] FULLT1 (Level 3+4)
- [ ] NJ Reduced
- [ ] Commercial "C"
- [ ] NJ Data of Known Quality Protocol Reporting
- [ ] NYASP Category A
- [ ] NYASP Category B
- [ ] State Forms
- [x] EDD Format
- [ ] Other

Commercial "A" = Results Only; Commercial "B" = Results + QC Summary
NJ Reduced = Results + QC Summary + Partial Raw data

Comments / Special Instructions

INITIAL ASESSMENT JL 2B
LABEL VERIFICATION

Sample inventory is verified upon receipt in the Laboratory

Sample Custody must be documented below each time samples change possession, including courier delivery.

	Relinquished by Sampler:	Date Time:	Received By:	Relinquished By:	Date Time:	Received By:
1		3/15/19 1410	Robert Chambers	Robert Chambers	3.15.19 1558	
2	Relinquished by Sampler:	Date Time:	Received By:	Relinquished By:	Date Time:	Received By:
3						
4	Relinquished by:	Date Time:	Received By:	Custody Seal # 19418	Intact / Not intact	Preserved where applicable
5						On Ice X Cooler Temp. 1.6, 3.2 °C

Form:SM088-03C (revised 2/12/18)

http://www.sgs.com/en/terms-and-conditions.

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Page 2 of 2

FED-EX Tracking # | Bottle Order Control #
SGS Quote # | SGS Job # JC84519

Client / Reporting Information
Company Name: Arcadis
Street Address: 10 Friends Lane Suite 100
City State Zip: Newtown PA
Project Contact: Matthew Bell E-mail
Phone #: 610-755-7080
Sampler(s) Name(s): C. Cifelli Phone #

Project Information
Project Name: PPG Site 107 (Jersey City)
Street: 18 Chapel Avenue
City State: Jersey City NJ
Project #: NE000200.0003
Client Purchase Order #
Project Manager: Jim McLaughlin, Jr.

Billing Information (If different from Report to)
Company Name
Street Address
City State Zip
Attention:

Requested Analysis: Total Chromium, Trivalent Chromium, Hexavalent Chromium, Antimony, Nickel, Thallium, Vanadium

SGS Sample #	Field ID / Point of Collection	MEOH/DI Vial #	Date	Time	Sampled by	Grab (G) Comp (C)	Matrix	# of bottles	HCl	NaOH	HNO3	H2SO4	NONE	DI Water	MEOH	ENCORE	Total Chromium	Trivalent Chromium	Hexavalent Chromium	Antimony	Nickel	Thallium	Vanadium	LAB USE ONLY
9	SW-A7(4.0-4.5)MSD		3/15/19	0955	CC	G	SO	1					1				X	X	X	X	X	X	X	
11	108-M018-E		3/15/19	1000	CC	G	SO	1					1				(H)	(H)	(H)	(H)	(H)	(H)	(H)	
12	108-M018-N		3/15/19	1005	CC	G	SO	1					1				(H)	(H)	(H)	(H)	(H)	(H)	(H)	
13	108-M018-S		3/15/19	1010	CC	G	SO	1					1				(H)	(H)	(H)	(H)	(H)	(H)	(H)	

Matrix Codes: DW - Drinking Water; GW - Ground Water; WW - Water; SW - Surface Water; SO - Soil; SL - Sludge; SED-Sediment; OI - Oil; LIQ - Other Liquid; AIR - Air; SOL - Other Solid; WP - Wipe; FB - Field Blank; EB-Equipment Blank; RB - Rinse Blank; TB - Trip Blank

Turn Around Time (Business Days)
- ☐ 10 Business Days
- ☐ 5 Business Days
- ☐ 3 Business Days*
- ☒ 2 Business Days* (R)
- ☐ 1 Business Day*
- ☐ Other

All data available via Lablink
Approved By (SGS PM): / Date:
* Approval needed for 1-3 Business Day TAT

Deliverable
- ☐ Commercial "A" (Level 1)
- ☐ Commercial "B" (Level 2)
- ☐ NJ Reduced (Level 3)
- ☐ Full Tier I (Level 4)
- ☐ Commercial "C"
- ☐ NJ DKQP
- ☐ NYASP Category A
- ☐ NYASP Category B
- ☐ MA MCP Criteria
- ☐ CT RCP Criteria
- ☐ State Forms
- ☒ EDD Format EQUIS
- ☐ DOD-QSM5

Commercial "A" = Results only; Commercial "B" = Results + QC Summary
Commercial "C" = Results + QC Summary + Partial Raw data

Comments / Special Instructions
(H) - HOLD until further info

http://www.sgs.com/en/terms-and-conditions

Sample Custody must be documented below each time samples change possession, including courier delivery.

Relinquished by:	Date / Time:	Received By:	Relinquished By:	Date / Time:	Received By:
1 C. Cifelli	3/15/19 1410	1 Robertchambers	2 Robertchambers	3-15-19 1558	2 [signature]
3		3	4		4
5		5	Custody Seal # 19418	☐ Intact ☐ Not intact	Preserved where applicable ☐ Absent; Therm. ID: ; On Ice X; Cooler Temp. °C I.E 3.7°C

JC84519: Chain of Custody
Page 2 of 6

Report of Analysis

Client Sample ID:	FB(20190315)-A		
Lab Sample ID:	JC84519-1	**Date Sampled:**	03/15/19
Matrix:	AQ - Field Blank Soil	**Date Received:**	03/15/19
		Percent Solids:	n/a
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	< 0.010	0.010	mg/l	1	03/15/19 22:33	JOO	SW846 7196A
Redox Potential Vs H2	488		mv	1	03/21/19 00:15	EB	ASTM D1498-76
pH [a]	5.46		su	1	03/15/19 17:40	JP	SM4500H+ B-11

(a) Sample received out of holding time for pH analysis.

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A8(2.0-2.5)		
Lab Sample ID:	JC84519-2	**Date Sampled:**	03/15/19
Matrix:	SO - Soil	**Date Received:**	03/15/19
		Percent Solids:	80.0
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	17.0 J	0.50	mg/kg	1	03/22/19 16:30	RI	SW846 3060A/7196A
Redox Potential Vs H2	348		mv	1	03/21/19 20:58	EB	ASTM D1498-76M
Solids, Percent	80		%	1	03/17/19 12:35	BG	SM2540 G 18TH ED MOD
pH	7.18 J		su	1	03/21/19 20:48	EB	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A8(4.0-4.5)		
Lab Sample ID:	JC84519-3	**Date Sampled:**	03/15/19
Matrix:	SO - Soil	**Date Received:**	03/15/19
		Percent Solids:	86.5
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	< 0.46 UJ	0.46	mg/kg	1	03/22/19 16:30	RI	SW846 3060A/7196A
Redox Potential Vs H2	374		mv	1	03/21/19 21:04	EB	ASTM D1498-76M
Solids, Percent	86.5		%	1	03/17/19 12:35	BG	SM2540 G 18TH ED MOD
pH	7.17 J		su	1	03/21/19 20:50	EB	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A8(6.0-6.5)		
Lab Sample ID:	JC84519-4	**Date Sampled:**	03/15/19
Matrix:	SO - Soil	**Date Received:**	03/15/19
		Percent Solids:	87.6
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	< 0.46 UJ	0.46	mg/kg	1	03/22/19 16:30	RI	SW846 3060A/7196A
Redox Potential Vs H2	373		mv	1	03/21/19 21:06	EB	ASTM D1498-76M
Solids, Percent	87.6		%	1	03/17/19 12:35	BG	SM2540 G 18TH ED MOD
pH	7.17 J		su	1	03/21/19 20:52	EB	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID: 108_M018W2
Lab Sample ID: JC84519-5
Matrix: SO - Soil
Project: PPG Site 107, 18 Chapel Avenue, Jersey City, NJ

Date Sampled: 03/15/19
Date Received: 03/15/19
Percent Solids: 87.1

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	0.48 J	0.46	mg/kg	1	03/22/19 16:30	RI	SW846 3060A/7196A
Redox Potential Vs H2	272		mv	1	03/21/19 21:47	EB	ASTM D1498-76M
Solids, Percent	87.1		%	1	03/17/19 12:35	BG	SM2540 G 18TH ED MOD
pH	7.63 J		su	1	03/21/19 20:59	EB	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID:	108_M018W1		
Lab Sample ID:	JC84519-6	**Date Sampled:**	03/15/19
Matrix:	SO - Soil	**Date Received:**	03/15/19
		Percent Solids:	86.9
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	3.1 J	0.46	mg/kg	1	03/22/19 16:30	RI	SW846 3060A/7196A
Redox Potential Vs H2	308		mv	1	03/21/19 21:51	EB	ASTM D1498-76M
Solids, Percent	86.9		%	1	03/17/19 12:35	BG	SM2540 G 18TH ED MOD
pH	7.61 J		su	1	03/21/19 21:04	EB	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A7(0.0-0.5)		
Lab Sample ID:	JC84519-7	**Date Sampled:**	03/15/19
Matrix:	SO - Soil	**Date Received:**	03/15/19
		Percent Solids:	79.7
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	12.5 J	0.50	mg/kg	1	03/22/19 16:30	RI	SW846 3060A/7196A
Redox Potential Vs H2	340		mv	1	03/21/19 21:57	EB	ASTM D1498-76M
Solids, Percent	79.7		%	1	03/17/19 12:35	BG	SM2540 G 18TH ED MOD
pH	7.33 J		su	1	03/21/19 21:07	EB	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A7(2.0-2.5)		
Lab Sample ID:	JC84519-8	**Date Sampled:**	03/15/19
Matrix:	SO - Soil	**Date Received:**	03/15/19
		Percent Solids:	81.8
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	4.0 J	0.49	mg/kg	1	03/22/19 16:30	RI	SW846 3060A/7196A
Redox Potential Vs H2	468		mv	1	03/21/19 22:17	EB	ASTM D1498-76M
Solids, Percent	81.8		%	1	03/17/19 12:35	BG	SM2540 G 18TH ED MOD
pH	7.18 J		su	1	03/21/19 21:13	EB	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A7(4.0-4.5)		
Lab Sample ID:	JC84519-9	**Date Sampled:**	03/15/19
Matrix:	SO - Soil	**Date Received:**	03/15/19
		Percent Solids:	83.9
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	2.0 J	0.48	mg/kg	1	03/22/19 16:23	RI	SW846 3060A/7196A
Redox Potential Vs H2	416		mv	1	03/21/19 20:49	EB	ASTM D1498-76M
Solids, Percent	83.9		%	1	03/17/19 12:35	BG	SM2540 G 18TH ED MOD
pH	5.19 J		su	1	03/21/19 20:44	EB	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID:	DUP-04(20190315)RR		
Lab Sample ID:	JC84519-10	**Date Sampled:**	03/15/19
Matrix:	SO - Soil	**Date Received:**	03/15/19
		Percent Solids:	88.7
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	< 0.45 UJ	0.45	mg/kg	1	03/22/19 16:30	RI	SW846 3060A/7196A
Redox Potential Vs H2	409		mv	1	03/21/19 22:21	EB	ASTM D1498-76M
Solids, Percent	88.7		%	1	03/17/19 12:35	BG	SM2540 G 18TH ED MOD
pH	7.25 J		su	1	03/21/19 21:46	EB	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID:	108_M018_E		
Lab Sample ID:	JC84519-11	**Date Sampled:**	03/15/19
Matrix:	SO - Soil	**Date Received:**	03/15/19
		Percent Solids:	60.1
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	< 0.67 UJ	0.67	mg/kg	1	03/22/19 16:30	RI	SW846 3060A/7196A
Redox Potential Vs H2	216		mv	1	03/22/19 23:08	EB	ASTM D1498-76M
Solids, Percent	60.1		%	1	03/21/19 09:15	RC	SM2540 G 18TH ED MOD
pH	7.75 J		su	1	03/22/19 22:25	EB	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID: FB(20190315)-A
Lab Sample ID: JC84519-1A
Matrix: AQ - Field Blank Soil
Project: PPG Site 107, 18 Chapel Avenue, Jersey City, NJ

Date Sampled: 03/15/19
Date Received: 03/15/19
Percent Solids: n/a

Total Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 6.0	6.0	ug/l	1	03/16/19	03/18/19	GT	SW846 6010D [1]	SW846 3010A [2]
Chromium	< 10	10	ug/l	1	03/16/19	03/18/19	GT	SW846 6010D [1]	SW846 3010A [2]
Nickel	< 10	10	ug/l	1	03/16/19	03/18/19	GT	SW846 6010D [1]	SW846 3010A [2]
Thallium	< 10	10	ug/l	1	03/16/19	03/18/19	GT	SW846 6010D [1]	SW846 3010A [2]
Vanadium	< 50	50	ug/l	1	03/16/19	03/18/19	GT	SW846 6010D [1]	SW846 3010A [2]

(1) Instrument QC Batch: MA46320
(2) Prep QC Batch: MP13173

RL = Reporting Limit

Report of Analysis

Client Sample ID:	FB(20190315)-A		
Lab Sample ID:	JC84519-1A	**Date Sampled:**	03/15/19
Matrix:	AQ - Field Blank Soil	**Date Received:**	03/15/19
		Percent Solids:	n/a
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	< 0.020	0.020	mg/l	1	03/18/19 14:07	GT	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A8(2.0-2.5)		
Lab Sample ID:	JC84519-2A	**Date Sampled:**	03/15/19
Matrix:	SO - Soil	**Date Received:**	03/15/19
		Percent Solids:	80.0
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 2.5 UJ-	2.5	mg/kg	1	03/15/19	03/18/19	GT	SW846 6010D [1]	SW846 3050B [2]
Chromium	160	1.2	mg/kg	1	03/15/19	03/18/19	GT	SW846 6010D [1]	SW846 3050B [2]
Nickel	19.5	5.0	mg/kg	1	03/15/19	03/18/19	GT	SW846 6010D [1]	SW846 3050B [2]
Thallium	< 1.2	1.2	mg/kg	1	03/15/19	03/18/19	GT	SW846 6010D [1]	SW846 3050B [2]
Vanadium	25.7	6.2	mg/kg	1	03/15/19	03/18/19	GT	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA46320
(2) Prep QC Batch: MP13172

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A8(2.0-2.5)		
Lab Sample ID:	JC84519-2A	**Date Sampled:**	03/15/19
Matrix:	SO - Soil	**Date Received:**	03/15/19
		Percent Solids:	80.0
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	143	1.7	mg/kg	1	03/22/19 16:30	RI	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A8(4.0-4.5)		
Lab Sample ID:	JC84519-3A	**Date Sampled:**	03/15/19
Matrix:	SO - Soil	**Date Received:**	03/15/19
		Percent Solids:	86.5
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 2.2 UJ-	2.2	mg/kg	1	03/15/19	03/18/19	GT	SW846 6010D [1]	SW846 3050B [2]
Chromium	20.2	1.1	mg/kg	1	03/15/19	03/18/19	GT	SW846 6010D [1]	SW846 3050B [2]
Nickel	13.7	4.5	mg/kg	1	03/15/19	03/18/19	GT	SW846 6010D [1]	SW846 3050B [2]
Thallium	< 1.1	1.1	mg/kg	1	03/15/19	03/18/19	GT	SW846 6010D [1]	SW846 3050B [2]
Vanadium	31.4	5.6	mg/kg	1	03/15/19	03/18/19	GT	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA46320
(2) Prep QC Batch: MP13172

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A8(4.0-4.5)		
Lab Sample ID:	JC84519-3A	**Date Sampled:**	03/15/19
Matrix:	SO - Soil	**Date Received:**	03/15/19
		Percent Solids:	86.5
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	20.2	1.6	mg/kg	1	03/22/19 16:30	RI	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A8(6.0-6.5)		
Lab Sample ID:	JC84519-4A	**Date Sampled:**	03/15/19
Matrix:	SO - Soil	**Date Received:**	03/15/19
		Percent Solids:	87.6
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 2.4 UJ-	2.4	mg/kg	1	03/15/19	03/18/19	GT	SW846 6010D [1]	SW846 3050B [2]
Chromium	16.6	1.2	mg/kg	1	03/15/19	03/18/19	GT	SW846 6010D [1]	SW846 3050B [2]
Nickel	14.0	4.8	mg/kg	1	03/15/19	03/18/19	GT	SW846 6010D [1]	SW846 3050B [2]
Thallium	< 1.2	1.2	mg/kg	1	03/15/19	03/18/19	GT	SW846 6010D [1]	SW846 3050B [2]
Vanadium	23.8	6.0	mg/kg	1	03/15/19	03/18/19	GT	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA46320
(2) Prep QC Batch: MP13172

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A8(6.0-6.5)		
Lab Sample ID:	JC84519-4A	**Date Sampled:**	03/15/19
Matrix:	SO - Soil	**Date Received:**	03/15/19
		Percent Solids:	87.6
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	16.2	1.7	mg/kg	1	03/22/19 16:30	RI	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	108_M018W2		
Lab Sample ID:	JC84519-5A	**Date Sampled:**	03/15/19
Matrix:	SO - Soil	**Date Received:**	03/15/19
		Percent Solids:	87.1
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 2.2 UJ-	2.2	mg/kg	1	03/15/19	03/18/19	GT	SW846 6010D [1]	SW846 3050B [2]
Chromium	32.0	1.1	mg/kg	1	03/15/19	03/18/19	GT	SW846 6010D [1]	SW846 3050B [2]
Nickel	14.9	4.5	mg/kg	1	03/15/19	03/18/19	GT	SW846 6010D [1]	SW846 3050B [2]
Thallium	< 1.1	1.1	mg/kg	1	03/15/19	03/18/19	GT	SW846 6010D [1]	SW846 3050B [2]
Vanadium	36.1	5.6	mg/kg	1	03/15/19	03/18/19	GT	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA46320
(2) Prep QC Batch: MP13172

RL = Reporting Limit

Report of Analysis

Client Sample ID:	108_M018W2		
Lab Sample ID:	JC84519-5A	**Date Sampled:**	03/15/19
Matrix:	SO - Soil	**Date Received:**	03/15/19
		Percent Solids:	87.1
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	31.5	1.6	mg/kg	1	03/22/19 16:30	RI	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID: 108_M018W1
Lab Sample ID: JC84519-6A
Matrix: SO - Soil
Project: PPG Site 107, 18 Chapel Avenue, Jersey City, NJ

Date Sampled: 03/15/19
Date Received: 03/15/19
Percent Solids: 86.9

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 2.2 UJ-	2.2	mg/kg	1	03/15/19	03/18/19	GT	SW846 6010D [1]	SW846 3050B [2]
Chromium	149	1.1	mg/kg	1	03/15/19	03/18/19	GT	SW846 6010D [1]	SW846 3050B [2]
Nickel	20.0	4.5	mg/kg	1	03/15/19	03/18/19	GT	SW846 6010D [1]	SW846 3050B [2]
Thallium [a]	< 2.2	2.2	mg/kg	2	03/15/19	03/18/19	GT	SW846 6010D [1]	SW846 3050B [2]
Vanadium	25.5	5.6	mg/kg	1	03/15/19	03/18/19	GT	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA46320
(2) Prep QC Batch: MP13172

(a) Elevated detection limit due to dilution required for high interfering element.

RL = Reporting Limit

Report of Analysis

Client Sample ID:	108_M018W1		
Lab Sample ID:	JC84519-6A	**Date Sampled:**	03/15/19
Matrix:	SO - Soil	**Date Received:**	03/15/19
		Percent Solids:	86.9
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	146	1.6	mg/kg	1	03/22/19 16:30	RI	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A7(0.0-0.5)		
Lab Sample ID:	JC84519-7A	**Date Sampled:**	03/15/19
Matrix:	SO - Soil	**Date Received:**	03/15/19
		Percent Solids:	79.7
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 2.4 UJ-	2.4	mg/kg	1	03/15/19	03/18/19	GT	SW846 6010D [1]	SW846 3050B [2]
Chromium	691	1.2	mg/kg	1	03/15/19	03/18/19	GT	SW846 6010D [1]	SW846 3050B [2]
Nickel	22.5	4.9	mg/kg	1	03/15/19	03/18/19	GT	SW846 6010D [1]	SW846 3050B [2]
Thallium	< 1.2	1.2	mg/kg	1	03/15/19	03/18/19	GT	SW846 6010D [1]	SW846 3050B [2]
Vanadium	46.0	6.1	mg/kg	1	03/15/19	03/18/19	GT	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA46320
(2) Prep QC Batch: MP13172

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A7(0.0-0.5)		
Lab Sample ID:	JC84519-7A	**Date Sampled:**	03/15/19
Matrix:	SO - Soil	**Date Received:**	03/15/19
		Percent Solids:	79.7
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	679	1.7	mg/kg	1	03/22/19 16:30	RI	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A7(2.0-2.5)		
Lab Sample ID:	JC84519-8A	**Date Sampled:**	03/15/19
Matrix:	SO - Soil	**Date Received:**	03/15/19
		Percent Solids:	81.8
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 2.5 UJ-	2.5	mg/kg	1	03/15/19	03/18/19	GT	SW846 6010D [1]	SW846 3050B [2]
Chromium	317	1.3	mg/kg	1	03/15/19	03/18/19	GT	SW846 6010D [1]	SW846 3050B [2]
Nickel	17.6	5.1	mg/kg	1	03/15/19	03/18/19	GT	SW846 6010D [1]	SW846 3050B [2]
Thallium	< 1.3	1.3	mg/kg	1	03/15/19	03/18/19	GT	SW846 6010D [1]	SW846 3050B [2]
Vanadium	44.8	6.4	mg/kg	1	03/15/19	03/18/19	GT	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA46320
(2) Prep QC Batch: MP13172

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A7(2.0-2.5)		
Lab Sample ID:	JC84519-8A	**Date Sampled:**	03/15/19
Matrix:	SO - Soil	**Date Received:**	03/15/19
		Percent Solids:	81.8
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	313	1.8	mg/kg	1	03/22/19 16:30	RI	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A7(4.0-4.5)		
Lab Sample ID:	JC84519-9A	**Date Sampled:**	03/15/19
Matrix:	SO - Soil	**Date Received:**	03/15/19
		Percent Solids:	83.9
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 2.4 UJ-	2.4	mg/kg	1	03/15/19	03/18/19	GT	SW846 6010D [1]	SW846 3050B [2]
Chromium	67.1	1.2	mg/kg	1	03/15/19	03/18/19	GT	SW846 6010D [1]	SW846 3050B [2]
Nickel	13.3	4.7	mg/kg	1	03/15/19	03/18/19	GT	SW846 6010D [1]	SW846 3050B [2]
Thallium	< 1.2	1.2	mg/kg	1	03/15/19	03/18/19	GT	SW846 6010D [1]	SW846 3050B [2]
Vanadium	21.3	5.9	mg/kg	1	03/15/19	03/18/19	GT	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA46320
(2) Prep QC Batch: MP13172

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A7(4.0-4.5)		
Lab Sample ID:	JC84519-9A	**Date Sampled:**	03/15/19
Matrix:	SO - Soil	**Date Received:**	03/15/19
		Percent Solids:	83.9
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	65.1	1.7	mg/kg	1	03/22/19 16:23	RI	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	DUP-04(20190315)RR		
Lab Sample ID:	JC84519-10A	**Date Sampled:**	03/15/19
Matrix:	SO - Soil	**Date Received:**	03/15/19
		Percent Solids:	88.7
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 2.3 UJ-	2.3	mg/kg	1	03/15/19	03/18/19	GT	SW846 6010D [1]	SW846 3050B [2]
Chromium	15.6	1.1	mg/kg	1	03/15/19	03/18/19	GT	SW846 6010D [1]	SW846 3050B [2]
Nickel	11.5	4.6	mg/kg	1	03/15/19	03/18/19	GT	SW846 6010D [1]	SW846 3050B [2]
Thallium	< 1.1	1.1	mg/kg	1	03/15/19	03/18/19	GT	SW846 6010D [1]	SW846 3050B [2]
Vanadium	23.4	5.7	mg/kg	1	03/15/19	03/18/19	GT	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA46320
(2) Prep QC Batch: MP13172

RL = Reporting Limit

Report of Analysis

Client Sample ID:	DUP-04(20190315)RR		
Lab Sample ID:	JC84519-10A	**Date Sampled:**	03/15/19
Matrix:	SO - Soil	**Date Received:**	03/15/19
		Percent Solids:	88.7
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	15.2	1.6	mg/kg	1	03/22/19 16:30	RI	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	108_M018_E		
Lab Sample ID:	JC84519-11A	**Date Sampled:**	03/15/19
Matrix:	SO - Soil	**Date Received:**	03/15/19
		Percent Solids:	60.1
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	3.9 J-	3.2	mg/kg	1	03/28/19	03/29/19	ND	SW846 6010D [1]	SW846 3050B [2]
Chromium	1210	1.6	mg/kg	1	03/28/19	03/29/19	ND	SW846 6010D [1]	SW846 3050B [2]
Nickel	40.7	6.3	mg/kg	1	03/28/19	03/29/19	ND	SW846 6010D [1]	SW846 3050B [2]
Thallium	< 1.6	1.6	mg/kg	1	03/28/19	03/29/19	ND	SW846 6010D [1]	SW846 3050B [2]
Vanadium	59.3	7.9	mg/kg	1	03/28/19	03/29/19	ND	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA46390
(2) Prep QC Batch: MP13594

RL = Reporting Limit

Report of Analysis

Client Sample ID:	108_M018_E		
Lab Sample ID:	JC84519-11A	**Date Sampled:**	03/15/19
Matrix:	SO - Soil	**Date Received:**	03/15/19
		Percent Solids:	60.1
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	1210	2.3	mg/kg	1	03/29/19 14:23	ND	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

ARCADIS Design & Consultancy for natural and built assets

PPG Industries

DATA QUALITY ASSESSMENT

Site 107 Fashionland

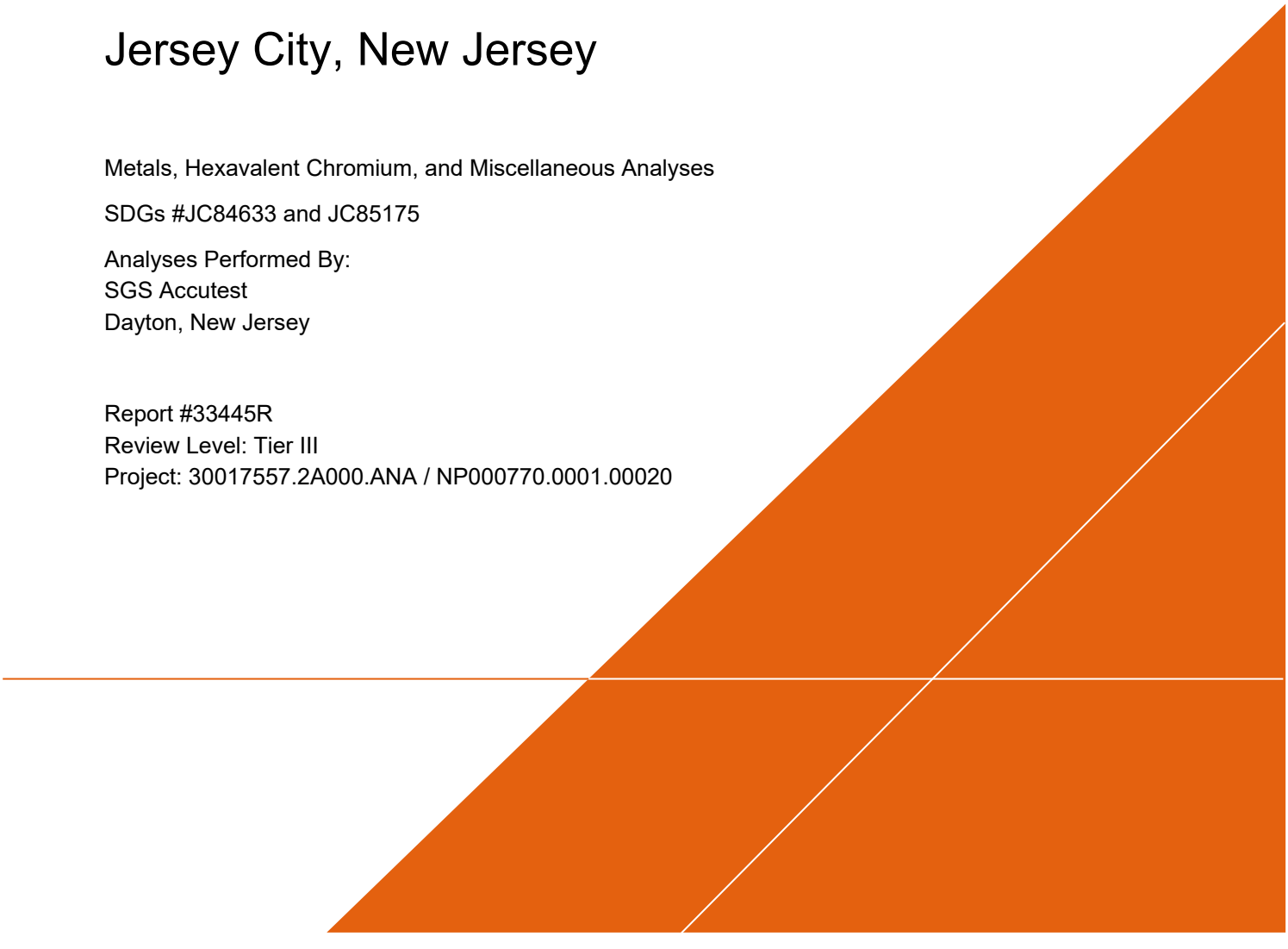
Jersey City, New Jersey

Metals, Hexavalent Chromium, and Miscellaneous Analyses

SDGs #JC84633 and JC85175

Analyses Performed By:
SGS Accutest
Dayton, New Jersey

Report #33445R
Review Level: Tier III
Project: 30017557.2A000.ANA / NP000770.0001.00020



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Groups (SDGs) # JC84633 and JC85175 for samples collected in association with the PPG Industries Site 107 Fashionland, Jersey City, New Jersey Site. The review was conducted as a Tier III evaluation and included review of data package completeness. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

SDG	Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis		
						Cr VI	MET	MISC
JC84633	FB(20190318)-A	JC84633-1	Water	3/18/2019		X	X	X
	SW-A9(0.0-0.5)	JC84633-2	Soil	3/18/2019		X	X	X
	SW-A9(2.0-2.5)	JC84633-3	Soil	3/18/2019		X	X	X
	SW-A9(4.0-4.5)	JC84633-4	Soil	3/18/2019		X	X	X
	SW-A9(5.5-6.0)	JC84633-5	Soil	3/18/2019		X	X	X
	SW-A10(4.0-4.5)	JC84633-6	Soil	3/18/2019		X	X	X
	SW-A10(6.0-6.5)	JC84633-7	Soil	3/18/2019		X	X	X
	SW-A10(7.5-8.0)	JC84633-8	Soil	3/18/2019		X	X	X
JC85175	FB(20190326)	JC85175-1	Water	3/26/2019		X	X	X
	SW-A58(0.0-0.5)	JC85175-2	Soil	3/26/2019		X	X	X
	SW-A58(2.0-2.5)	JC85175-3	Soil	3/26/2019		X	X	X
	SW-A58(4.0-4.5)	JC85175-4	Soil	3/26/2019		X	X	X
	SW-A58(5.0-5.5)	JC85175-5	Soil	3/26/2019		X	X	X
	BS-J5	JC85175-6	Soil	3/26/2019		X	X	X
	107_D019	JC85175-7	Soil	3/26/2019		X	X	X

Notes:

1. Metals include antimony, chromium, nickel, thallium, and vanadium. Trivalent chromium is reported by calculation (Chromium) – (Hexavalent Chromium).
2. Cr VI is hexavalent chromium.
3. Miscellaneous parameters include pH and redox potential.

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of QA or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

Note:
QA - Quality Assurance

INORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Methods 6010C, 7196A, and 9045D; Standard Methods (SM) 4500H+B and SM4500S2-A; Lloyd Kahn; and ASTM D1498-76 and D3872-86. Data were reviewed in accordance with USEPA Region 2 SOP HW-2b, Revision 15 (December 2012); New Jersey Division of Remediation Management and Response Standard Operating Procedure for Analytical Data Validation of Hexavalent Chromium (September 2009); New Jersey Department of Environmental Protection Data Quality Assessment and Data Usability Evaluation Technical Guidance (April 2014); Field Sampling Plan/Quality Assurance Project Plan, PPG Non-Residential and Residential Chromium Sites, Hudson County, New Jersey (AECOM, June 2010); and Arcadis Quality Assurance Project Plan – Addendum, Site 107 Fashionland, Jersey City, New Jersey (Arcadis, June 2018).

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and that it was already subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with the USEPA National Functional Guidelines:

- Concentration (C) Qualifiers
  - U The analyte was analyzed for but not detected. The associated value is the analyte instrument detection limit.
  - B The reported value was obtained from a reading less than the reporting limit (RL), but greater than or equal to the method detection limit (MDL).
- Quantitation (Q) Qualifiers
  - E The reported value is estimated due to the presence of interference.
  - N Spiked sample recovery is not within control limits.
  - * Duplicate analysis is not within control limits.
- Validation Qualifiers
  - J The analyte was positively identified; however, the associated numerical value is an estimated concentration only.
  - J+ The result is an estimated quantity, but the result may be biased high.
  - J- The result is an estimated quantity, but the result may be biased low.
  - UJ The analyte was not detected above the reporting limit. However, the reported limit is approximate and may or may not represent the actual limit of detection.
  - UB Analyte considered non-detect at the listed value due to associated blank contamination.
  - R The data are unusable. The sample results are rejected due to serious deficiencies in meeting Quality Control (QC) critieria. The analyte may or may not be present in the sample.

Two facts should be noted by all data users. First, the “R” flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. “R” values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

METALS ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 6010C	Water	180 days from collection to analysis	Preserved to a pH of less than 2; Cool to <6°C
	Soil	180 days from collection to analysis	Cool to <6°C

All samples were analyzed within the specified holding times.

2. Blank Contamination

Quality assurance (QA) blanks (i.e., method and rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank is calculated for QA blanks containing concentrations greater than the method detection limit (MDL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Analytes were not detected above the MDL in the associated blanks; therefore, detected sample results were not associated with blank contamination.

3. Calibration

Satisfactory instrument calibration is established to provide that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument's continuing performance is satisfactory.

3.1 Initial Calibration and Continuing Calibration

The correct number and type of standards were analyzed. The correlation coefficient of the initial calibration was greater than 0.998 and all initial calibration verification standard and continuing calibration verification standard recoveries were within control limits of 90% to 110%.

All continuing calibration verification standard recoveries were within the control limit.

3.2 Low-Level Calibration Verification

The low-level initial and continuing calibration check standard serves to verify the linearity of calibration of the analysis at the reporting limit.

All RL standard recoveries were within control limits of 70% to 130% (50% to 150% for antimony and thallium).

3.3 ICP Interference Control Sample (ICS)

The ICS verifies the laboratories interelement and background correction factors.

All ICS exhibited recoveries within the control limits of 80% to 120%.

4. Matrix Spike/Matrix Spike Duplicate (MS/MSD)/Laboratory Duplicate Analysis

MS/MSD and laboratory duplicate data are used to assess the precision and accuracy of the analytical method.

4.1 MS/MSD Analysis

All metal analytes must exhibit a percent recovery within the established acceptance limits of 75% to 125%. The MS/MSD recovery control limits do not apply for MS/MSD performed on sample locations where the analyte's concentration detected in the parent sample exceeds the MS/MSD concentration by a factor of four or greater.

SDG #JC84633: The MS/MSD analysis was not performed using a sample from this SDG.

SDG #JC85175: The MS/MSD analysis performed on sample location SW-A58(4.0-4.5) exhibited recoveries within the control limits with the exception of the analytes presented in the table below.

Sample Location	Analyte	MS Recovery	MSD Recovery
SW-A58(4.0-4.5)	Antimony	55.3%	53.0%

The criteria used to evaluate MS/MSD recoveries are presented in the following table. In the case of an MS/MSD deviation, the sample results are qualified. The qualifications are applied to all sample results associated with the sample preparation batch.

Control limit	Sample Result	Qualification
MS/MSD percent recovery 30% to 74%	Non-detect	UJ-
	Detect	J-
MS/MSD percent recovery < 30%	Non-detect	R
	Detect	J-
MS/MSD percent recovery > 125%	Non-detect	No Action
	Detect	J+

4.2 Laboratory Duplicate Analysis

The laboratory duplicate relative percent difference (RPD) criterion is applied when parent and duplicate sample concentrations are greater than or equal to 5 times the RL. A control limit of 20% for water matrices and 35% for soil matrices is applied when the criteria above is true. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of ± the RL is applied.

SDG #JC84633: The laboratory duplicate analysis was not performed using a sample from this SDG.

SDG #JC85175: MS/MSD analysis was performed in replacement of the laboratory duplicate analysis using sample SW-A58(4.0-4.5). The MS/MSD recoveries exhibited acceptable RPDs.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 50% for soil matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of three times the RL is applied for soil matrices.

A field duplicate sample was not collected in association with these SDGs.

6. Laboratory Control Sample (LCS) Analysis

The LCS analysis is used to assess the accuracy of the analytical method independent of matrix interferences. The analytes associated with the LCS analysis must exhibit a percent recovery between the control limits of 80% and 120%.

The LCS analysis exhibited recoveries and RPDs within the control limits.

7. Serial Dilution

The serial dilution analysis is used to assess if a significant physical or chemical interference exists due to sample matrix. Analytes exhibiting concentrations greater than 10 times the RL in the undiluted sample are evaluated to determine if matrix interference exists. These analytes are required to have less than a 10% difference (%D) between sample results from the undiluted (parent) sample and results associated with the same sample analyzed with a five-fold dilution.

SDG #JC84633: The serial dilution analysis was not performed using a sample from this SDG.

SDG #JC85175: The serial dilution analysis performed using sample SW-A58(4.0-4.5) exhibited %D within the control limits.

8. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR METALS

METALS: SW-846 6010C	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Inductively Coupled Plasma-Atomic Emission Spectrometry (ICP-AES)					
Tier II Validation					
Holding Times		X		X	
Reporting limits (units)		X		X	
Blanks					
A. Instrument Blanks		X		X	
B. Method Blanks		X		X	
C. Equipment/Field Blanks		X		X	
Laboratory Control Sample (LCS)		X		X	
Laboratory Control Sample Duplicate (LCSD)	X				X
LCS/LCSD Precision (RPD)	X				X
Matrix Spike (MS) %R		X	X		
Matrix Spike Duplicate (MSD) %R		X	X		
MS/MSD Precision (RPD)		X		X	
Field/Lab Duplicate (RPD)	X				X
ICP Serial Dilution %D		X		X	
Total vs. Dissolved	X				X
Reporting Limit Verification		X		X	
Tier III Validation					
Initial Calibration Verification		X		X	
Continuing Calibration Verification		X		X	
CRDL Standard Recovery		X		X	
ICP Interference Check		X		X	
ICP-MS Internal Standards	X				X
Transcription/calculations acceptable		X		X	
Raw Data	X				X
Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%R Percent recovery

RPD Relative percent difference

%D Percent difference

HEXAVALENT CHROMIUM ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 7196A	Water	24 hours from collection to analysis	Cool to <6°C
SW-846 3060A/ 7196A	Soil	30 days from collection to extraction; 7 days from extraction to analysis	Cool to <6°C

All samples were analyzed within the specified holding times.

2. Blank Contamination

Quality assurance (QA) blanks (i.e., method and rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank is calculated for QA blanks containing concentrations greater than the method detection limit (MDL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Analytes were not detected above the MDL in the associated blanks; therefore, detected sample results were not associated with blank contamination.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

The correct number and type of standards were analyzed. The correlation coefficient of the initial calibration was greater than 0.995 and all calibration verification standard recoveries were within control limits of 90% to 110%.

4. Matrix Spike (MS)/Post-Digestion Spike (PDS)/Laboratory Duplicate Analysis

MS, PDS, and laboratory duplicate data are used to assess the precision and accuracy of the analytical method.

4.1 MS Analysis

Soluble and insoluble spike sample analyses are designed to provide information about the effect of the sample matrix on the digestion and measurement methodology. The insoluble spike is used to evaluate the dissolution during the digestion process. Hexavalent chromium must exhibit a percent recovery within

the established acceptance limits of 75% to 125% in both the soluble and insoluble spiked analyses. The control limits do not apply when the parent sample concentration exceeds the spike amount by a factor of four or greater.

SDG #JC84633: The MS analysis performed on sample location SW-A9(5.5-6.0) in association with the insoluble hexavalent chromium analysis exhibited recoveries within the control limits.

SDG #JC85175: The MS analysis performed on sample location SW-A58(4.0-4.5) in association with the insoluble and soluble hexavalent chromium analysis exhibited recoveries within the control limits.

SDG #JC84633: The MS analysis performed on sample location SW-A9(5.5-6.0) exhibited spike recoveries less than the lower control limits as presented in the table below.

Sample Location	Analyte	Initial Spike Recovery	Reanalysis Spike Recovery
SW-A9(5.5-6.0)	Hexavalent Chromium, Soluble	> 125%	65.8%

The criteria used to evaluate spike recoveries are presented in the following table. The qualifications are applied to all sample results associated with the sample preparation batch. In the event of a recovery outside of the control limits, the MS must be reanalyzed.

Control limit	Sample Result	Qualification[1]
Spike recovery ≥ 50% but < 75%	Non-detect	UJ-
	Detect	J-
Spike recovery < 50%	Non-detect	R
	Detect	R
Spike recovery > 125%	Non-detect	No Action
Spike recovery > 125% but ≤ 150%	Detect	J+
Spike recovery > 150%	Detect	R

Notes:

[1] If recoveries are < 50% or > 150% for both insoluble and soluble spikes, associated data will be rejected ("R"); otherwise qualify associated data if one of the spikes is outside the < 50% or > 150% limits.

SDG #JC84633: The original analyses of the field samples are usable with appropriate qualification. No sample results were rejected.

4.2 Post-Digestion Spike (PDS) Analysis

The PDS analysis is designed to verify that neither a reducing condition nor a chemical interference is affecting the analysis. This is accomplished by analyzing a second aliquot of the pH-adjusted filtrate that has been spiked with hexavalent chromium. The PDS must exhibit a percent recovery within the method acceptance limits of 85% to 115%.

SDGs #JC84633 and JC85175: The PDS analysis performed on sample locations SW-A9(5.5-6.0) and SW-A58(4.0-4.5) exhibited recoveries within the control limits.

4.3 Laboratory Duplicate Analysis

The laboratory duplicate relative percent difference (RPD) criterion is applied when parent and duplicate sample concentrations are greater than or equal to four times the RL. A control limit of 20% is applied when the criteria above is true. In the instance when the parent and/or duplicate sample concentrations are less than or equal to four times the RL, a control limit of ± the RL is used.

SDG #JC85175: The laboratory duplicate analysis performed on sample location SW-A58(4.0-4.5) exhibited results within the control limit.

SDG #JC84633: All analytes associated with laboratory duplicate were within the control limit, with the exception of the analytes presented in the following table.

Sample Location	Analytes	Laboratory Duplicate RPD
SW-A9(5.5-6.0)	Hexavalent Chromium	> ± RL

The criteria used to evaluate laboratory duplicate RPD are presented in the following table. In the case of a laboratory duplicate RPD deviation, the sample results are qualified. The qualifications are applied to all sample results associated with the sample preparation batch.

Sample Concentration	Control Limit	Sample Result	Qualification
Parent sample and/or laboratory duplicate sample result > four times the RL	> 20%	Non-detect	UJ
		Detect	J
Parent sample and/or laboratory duplicate sample result < four times the RL	± RL	Non-detect	UJ
		Detect	J

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 50% for soil matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of three times the RL is applied for soil matrices.

A field duplicate sample was not collected in association with these SDGs.

6. Laboratory Control Sample (LCS) Analysis

The LCS analysis is used to assess the precision and accuracy of the analytical method independent of matrix interferences. The analytes associated with the LCS analysis must exhibit a percent recovery between the control limits of 80% and 120%.

The LCS analysis exhibited recoveries within the control limits.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR HEXAVALENT CHROMIUM

HEXAVALENT CHROMIUM: SW-846 7196A	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Spectrophotometer					
Tier II Validation					
Holding Times		X		X	
Reporting limits (units)		X		X	
Blanks					
A. Instrument Blanks		X		X	
B. Method Blanks		X		X	
C. Equipment/Field Blanks		X		X	
Laboratory Control Sample (LCS)		X		X	
Matrix Spike (MS) %R		X	X		
Matrix Spike Duplicate (MSD) %R	X				X
MS/MSD Precision (RPD)	X				X
Post Digestion Spike %R		X		X	
Field/Lab Duplicate (RPD)		X	X		
Dilution Factor		X		X	
Tier III Validation					
Initial calibration %RSD or correlation coefficient		X		X	
Continuing calibration %R		X		X	
Raw Data		X		X	
Transcription/calculation errors present		X		X	
Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%R Percent recovery

RPD Relative percent difference

%RSD Relative percent deviation

GENERAL CHEMISTRY ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
pH by SM4500H+B	Water	QAPP: 24 hours of receipt at laboratory	Cool to <6°C
pH by SW846 9045D	Soil	QAPP: 24 hours of receipt at laboratory	Cool to <6°C
Oxidation-Reduction Potential by ASTM D1498-76	Water	Not applicable	Cool to <6°C
Oxidation-Reduction Potential (Redox) by ASTM D1498-76	Soil	Measure immediately after creating leachate	Cool to <6°C

The analyses that exceeded the holding are presented in the following table.

Sample Locations	Method	Holding Time	Criteria
SW-A9(0.0-0.5) SW-A9(2.0-2.5) SW-A9(4.0-4.5) SW-A9(5.5-6.0) SW-A10(4.0-4.5) SW-A10(6.0-6.5) SW-A10(7.5-8.0)	SW846 9045D	Analysis: 4 days	< 24 hours of receipt by laboratory
SW-A58(0.0-0.5) SW-A58(2.0-2.5) SW-A58(4.0-4.5) SW-A58(5.0-5.5) BS-J5 107_D019		Analysis: 7 days	

Sample results were qualified as specified in the table below. All other holding times were met.

Criteria	Qualification	
	Detected Analytes	Non-detect Analytes
Analysis completed less than two times holding time	J	UJ
Analysis completed greater than two times holding time	J	R

2. Blank Contamination

Quality assurance (QA) blanks (i.e., method and rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank is calculated for QA blanks containing concentrations greater than the method detection limit (MDL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Method blank analysis is not applicable for Redox and pH analyses.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

The correct number and type of standards were analyzed. All buffer check results were within acceptance limits.

4. Laboratory Duplicate Analysis

Laboratory duplicate data are used to assess the precision of the analytical method. The laboratory duplicate relative percent difference (RPD) criterion is applied when parent and duplicate sample concentrations are greater than or equal to 5 times the RL. A control limit of 20% for water matrices and 35% for soil matrices is applied when the criteria above is true. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of ± the RL is applied.

SDG #JC84633: The laboratory duplicate analysis performed on sample location SW-A9(0.0-0.5) exhibited results within the control limit.

SDG #JC85175: The laboratory duplicate analysis was not performed using a sample from this SDG.

4. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 50% for soil matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of three times the RL is applied for soil matrices.

A field duplicate sample was not collected in association with these SDGs.

6. Laboratory Control Sample (LCS) Analysis

The LCS analysis is used to assess the precision and accuracy of the analytical method independent of matrix interferences. The analytes associated with the LCS analysis must exhibit a percent recovery between the control limits of 80% and 120%.

LCS results for redox potential, pH, and sulfide screen were not reported in the analytical report.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR GENERAL CHEMISTRY

General Chemistry: SM4500H+B, SW846 9045D, ASTM D1498-76	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Miscellaneous Instrumentation					
Tier II Validation					
Holding times		X	X		
Reporting limits (units)		X		X	
Blanks					
A. Instrument Blanks		X		X	
B. Method blanks		X		X	
C. Equipment blanks		X		X	
Laboratory Control Sample (LCS) %R		X		X	
Laboratory Control Sample Duplicate (LCSD) %R	X				X
LCS/LCSD Precision (RPD)	X				X
Matrix Spike (MS) %R	X				X
Matrix Spike Duplicate (MSD) %R	X				X
MS/MSD Precision (RPD)	X				X
Field/Lab Duplicate (RPD)		X		X	
Dilution Factor		X		X	
Tier III Validation					
Initial calibration %RSD or correlation coefficient	X				X
Continuing calibration %R	X				X
Raw Data		X		X	
Transcription/calculation errors present		X		X	
Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%R Percent recovery

RPD Relative percent difference

VALIDATION PERFORMED BY: Jennifer Singer

SIGNATURE: 

DATE: July 15, 2019

PEER REVIEW: Dennis Capria

DATE: July 18, 2019

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

SO FB

CHAIN OF CUSTODY

SGS North America Inc. - Dayton
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TEL. 732-329-0200 FAX 732-329-3499
www.sgs.com/ehsusa

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FED-EX Tracking #:
Bottle Order Control #: AK-03519-108
SGS Quote #:
SGS Job #: JC84633

Client / Reporting Information

Company Name: Arcadis
Street Address: 10 Friends Lane, Suite 108
City: Newtown State: PA Zip: 18940
Project Contact: Krista Mastrocola E-mail:
Phone #: 610. 755. 7080 Fax #:
Sampler(s) Name(s): Christian Cifelli Phone #: 201.264.8005

Project Information

Project Name: PPG Jersey City Site 107
Street: 18 Chapel Avenue
City: Jersey City State: NJ
Project #: N1000770.0003
Client Purchase Order #:
Project Manager: Jim McLaughlin

Billing Information (if different from Report to)

Company Name:
Street Address:
City State Zip:
Attention:

Requested Analysis (see TEST CODE sheet)

Matrix Codes: DW - Drinking Water; GW - Ground Water; WW - Water; SW - Surface Water; SO - Soil; SL- Sludge; SED-Sediment; OI - Oil; LIQ - Other Liquid; AIR - Air; SOL - Other Solid; WP - Wipe; FB-Field Blank; EB-Equipment Blank; RB- Rinse Blank; TB-Trip Blank

Lab Sample #	Field ID / Point of Collection	MEOH/DI Vial #	Collection Date	Collection Time	Sampled by	Matrix	# of bottles	HCl	NaOH	HNO3	H2SO4	NONE	DI Water	MEOH	ENCORE	Total Chromium	Trivalent Chromium	Hexavalent Chromium	Antimony	Vanadium	Nickel	Thallium	LAB USE ONLY
1	FB(20190318)-A		3/18/19	1030	CC	FB	2			1		1				X	X	X	X	X	X	X	A13
2	SW-A9(0.0-0.5)		3/18/19	1200	CC	SO	1					1				X	X	X	X	X	X	X	M4
3	SW-A9(2.0-2.5)		3/18/19	1205	CC	SO	1					1				X	X	X	X	X	X	X	
4	SW-A9(4.0-4.5)		3/18/19	1210	CC	SO	1					1				X	X	X	X	X	X	X	D19
5	SW-A9(5.5-6.0)		3/18/19	1215	CC	SO	1					1				X	X	X	X	X	X	X	
6	SW-A10(4.0-4.5)		3/18/19	1225	CC	SO	1					1				X	X	X	X	X	X	X	
7	SW-A10(6.0-6.5)		3/18/19	1230	CC	SO	1					1				X	X	X	X	X	X	X	
8	SW-A10(7.5-8.0)		3/18/19	1235	CC	SO	1					1				X	X	X	X	X	X	X	

Turnaround Time (Business days)

Approved by (SGS Project Manager)/Date:

- [ ] Std. 10 Business Days
- [ ] 5 Day RUSH
- [ ] 3 Day RUSH
- [x] 2 Day RUSH (A)
- [ ] 1 Day RUSH
- [ ] other

Emergency & Rush T/A data available via LabLink

Data Deliverable Information

- [ ] Commercial "A" (Level 1)
- [ ] Commercial "B" (Level 2)
- [ ] FULLT1 (Level 3+4)
- [ ] NJ Reduced
- [ ] Commercial "C"
- [ ] NJ Data of Known Quality Protocol Reporting
- [ ] NYASP Category A
- [ ] NYASP Category B
- [ ] State Forms
- [x] EDD Format EQuIS
- [ ] Other

Commercial "A" = Results Only; Commercial "B" = Results + QC Summary
NJ Reduced = Results + QC Summary + Partial Raw data

Comments / Special Instructions

INITIAL ASESSMENT 3A (1)
LABEL VERIFICATION

Sample inventory is verified upon receipt in the Laboratory

Sample Custody must be documented below each time samples change possession, including courier delivery.

Relinquished by Sampler:	Date Time:	Received By:	Relinquished By:	Date Time:	Received By:
	3/18/19 14:25	1 Robert Chambers	2 Robert Chambers	3.18.19 1623	2
3		3	4		4
5		5	Custody Seal # 14152 ☐ Intact ☐ Not intact	Preserved where applicable ☐	On Ice X Cooler Temp. 3.1 °C

Form:SM088-03C (revised 2/12/18)

http://www.sgs.com/en/terms-and-conditions.

Report of Analysis

Client Sample ID:	FB(20190318)-A		
Lab Sample ID:	JC84633-1	**Date Sampled:**	03/18/19
Matrix:	AQ - Field Blank Soil	**Date Received:**	03/18/19
		Percent Solids:	n/a
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	< 0.010	0.010	mg/l	1	03/18/19 23:15	JO	SW846 7196A
Redox Potential Vs H2	465		mv	1	03/22/19 23:20	EB	ASTM D1498-76
pH [a]	4.06		su	1	03/18/19 17:00	AS	SM4500H+ B-11

(a) Sample received out of holding time for pH analysis.

RL = Reporting Limit

Report of Analysis

Client Sample ID: SW-A9(0.0-0.5)
Lab Sample ID: JC84633-2
Matrix: SO - Soil
Project: PPG Site 107, 18 Chapel Avenue, Jersey City, NJ

Date Sampled: 03/18/19
Date Received: 03/18/19
Percent Solids: 78.7

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	40.5 J	0.51	mg/kg	1	04/01/19 13:47	RI	SW846 3060A/7196A
Redox Potential Vs H2	529		mv	1	03/22/19 20:29	EB	ASTM D1498-76M
Solids, Percent	78.7		%	1	03/19/19 09:15	RC	SM2540 G 18TH ED MOD
pH	7.33 J		su	1	03/22/19 20:02	EB	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID: SW-A9(2.0-2.5)
Lab Sample ID: JC84633-3
Matrix: SO - Soil
Project: PPG Site 107, 18 Chapel Avenue, Jersey City, NJ

Date Sampled: 03/18/19
Date Received: 03/18/19
Percent Solids: 68.5

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	1.6 J	0.58	mg/kg	1	04/01/19 13:47	RI	SW846 3060A/7196A
Redox Potential Vs H2	777		mv	1	03/22/19 20:39	EB	ASTM D1498-76M
Solids, Percent	68.5		%	1	03/19/19 09:15	RC	SM2540 G 18TH ED MOD
pH	5.67 J		su	1	03/22/19 20:06	EB	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A9(4.0-4.5)		
Lab Sample ID:	JC84633-4	**Date Sampled:**	03/18/19
Matrix:	SO - Soil	**Date Received:**	03/18/19
		Percent Solids:	83.8
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	6.0 J	0.48	mg/kg	1	04/01/19 13:47	RI	SW846 3060A/7196A
Redox Potential Vs H2	593		mv	1	03/22/19 20:46	EB	ASTM D1498-76M
Solids, Percent	83.8		%	1	03/19/19 09:15	RC	SM2540 G 18TH ED MOD
pH	6.62 J		su	1	03/22/19 20:11	EB	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A9(5.5-6.0)		
Lab Sample ID:	JC84633-5	**Date Sampled:**	03/18/19
Matrix:	SO - Soil	**Date Received:**	03/18/19
		Percent Solids:	85.5
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	1.7 J	0.47	mg/kg	1	04/01/19 13:42	RI	SW846 3060A/7196A
Redox Potential Vs H2	398		mv	1	03/22/19 22:06	EB	ASTM D1498-76M
Solids, Percent	85.5		%	1	03/19/19 09:15	RC	SM2540 G 18TH ED MOD
pH	7.60 J		su	1	03/22/19 20:15	EB	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A10(4.0-4.5)		
Lab Sample ID:	JC84633-6	**Date Sampled:**	03/18/19
Matrix:	SO - Soil	**Date Received:**	03/18/19
		Percent Solids:	84.2
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	< 0.48 UJ	0.48	mg/kg	1	04/01/19 13:47	RI	SW846 3060A/7196A
Redox Potential Vs H2	446		mv	1	03/22/19 22:12	EB	ASTM D1498-76M
Solids, Percent	84.2		%	1	03/19/19 09:15	RC	SM2540 G 18TH ED MOD
pH	6.69 J		su	1	03/22/19 20:19	EB	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID: SW-A10(6.0-6.5)
Lab Sample ID: JC84633-7
Matrix: SO - Soil
Project: PPG Site 107, 18 Chapel Avenue, Jersey City, NJ

Date Sampled: 03/18/19
Date Received: 03/18/19
Percent Solids: 78.0

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	0.95 J	0.51	mg/kg	1	04/01/19 13:47	RI	SW846 3060A/7196A
Redox Potential Vs H2	374		mv	1	03/22/19 22:21	EB	ASTM D1498-76M
Solids, Percent	78		%	1	03/19/19 09:15	RC	SM2540 G 18TH ED MOD
pH	6.06 J		su	1	03/22/19 20:21	EB	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A10(7.5-8.0)		
Lab Sample ID:	JC84633-8	**Date Sampled:**	03/18/19
Matrix:	SO - Soil	**Date Received:**	03/18/19
		Percent Solids:	79.7
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	1.3 J	0.50	mg/kg	1	04/01/19 13:47	RI	SW846 3060A/7196A
Redox Potential Vs H2	354		mv	1	03/22/19 22:25	EB	ASTM D1498-76M
Solids, Percent	79.7		%	1	03/19/19 09:15	RC	SM2540 G 18TH ED MOD
pH	7.52 J		su	1	03/22/19 20:23	EB	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A9(0.0-0.5)		
Lab Sample ID:	JC84633-2R	**Date Sampled:**	03/18/19
Matrix:	SO - Soil	**Date Received:**	03/18/19
		Percent Solids:	78.7
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	16.3	0.51	mg/kg	1	04/11/19 16:13	RI	SW846 3060A/7196A

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A9(2.0-2.5)		
Lab Sample ID:	JC84633-3R	**Date Sampled:**	03/18/19
Matrix:	SO - Soil	**Date Received:**	03/18/19
		Percent Solids:	68.5
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	1.5	0.58	mg/kg	1	04/11/19 16:13	RI	SW846 3060A/7196A

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A9(4.0-4.5)		
Lab Sample ID:	JC84633-4R	**Date Sampled:**	03/18/19
Matrix:	SO - Soil	**Date Received:**	03/18/19
		Percent Solids:	83.8
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	2.3	0.48	mg/kg	1	04/11/19 16:13	RI	SW846 3060A/7196A

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A9(5.5-6.0)		
Lab Sample ID:	JC84633-5R	**Date Sampled:**	03/18/19
Matrix:	SO - Soil	**Date Received:**	03/18/19
		Percent Solids:	85.5
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	2.6	0.47	mg/kg	1	04/11/19 16:05	RI	SW846 3060A/7196A

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A10(4.0-4.5)		
Lab Sample ID:	JC84633-6R	**Date Sampled:**	03/18/19
Matrix:	SO - Soil	**Date Received:**	03/18/19
		Percent Solids:	84.2
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	6.2	0.48	mg/kg	1	04/11/19 16:13	RI	SW846 3060A/7196A

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A10(6.0-6.5)		
Lab Sample ID:	JC84633-7R	**Date Sampled:**	03/18/19
Matrix:	SO - Soil	**Date Received:**	03/18/19
		Percent Solids:	78.0
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	< 0.51	0.51	mg/kg	1	04/11/19 16:13	RI	SW846 3060A/7196A

RL = Reporting Limit

Report of Analysis

Client Sample ID: SW-A10(7.5-8.0)
Lab Sample ID: JC84633-8R
Matrix: SO - Soil
Project: PPG Site 107, 18 Chapel Avenue, Jersey City, NJ

Date Sampled: 03/18/19
Date Received: 03/18/19
Percent Solids: 79.7

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	1.8	0.50	mg/kg	1	04/11/19 16:13	RI	SW846 3060A/7196A

RL = Reporting Limit

Report of Analysis

Client Sample ID: FB(20190318)-A
Lab Sample ID: JC84633-1A
Matrix: AQ - Field Blank Soil
Project: PPG Site 107, 18 Chapel Avenue, Jersey City, NJ

Date Sampled: 03/18/19
Date Received: 03/18/19
Percent Solids: n/a

Total Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 6.0	6.0	ug/l	1	03/19/19	03/19/19	ND	SW846 6010D [1]	SW846 3010A [3]
Chromium	< 10	10	ug/l	1	03/19/19	03/20/19	GT	SW846 6010D [2]	SW846 3010A [3]
Nickel	< 10	10	ug/l	1	03/19/19	03/19/19	ND	SW846 6010D [1]	SW846 3010A [3]
Thallium	< 10	10	ug/l	1	03/19/19	03/19/19	ND	SW846 6010D [1]	SW846 3010A [3]
Vanadium	< 50	50	ug/l	1	03/19/19	03/20/19	GT	SW846 6010D [2]	SW846 3010A [3]

(1) Instrument QC Batch: MA46328
(2) Instrument QC Batch: MA46330
(3) Prep QC Batch: MP13209

RL = Reporting Limit

Report of Analysis

Client Sample ID:	FB(20190318)-A		
Lab Sample ID:	JC84633-1A	**Date Sampled:**	03/18/19
Matrix:	AQ - Field Blank Soil	**Date Received:**	03/18/19
		Percent Solids:	n/a
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	< 0.020	0.020	mg/l	1	03/20/19 09:17	GT	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID: SW-A9(0.0-0.5)
Lab Sample ID: JC84633-2A
Matrix: SO - Soil
Project: PPG Site 107, 18 Chapel Avenue, Jersey City, NJ

Date Sampled: 03/18/19
Date Received: 03/18/19
Percent Solids: 78.7

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 2.6	2.6	mg/kg	1	03/18/19	03/19/19	ND	SW846 6010D [1]	SW846 3050B [2]
Chromium	135	1.3	mg/kg	1	03/18/19	03/19/19	ND	SW846 6010D [1]	SW846 3050B [2]
Nickel	20.1	5.2	mg/kg	1	03/18/19	03/19/19	ND	SW846 6010D [1]	SW846 3050B [2]
Thallium	< 1.3	1.3	mg/kg	1	03/18/19	03/19/19	ND	SW846 6010D [1]	SW846 3050B [2]
Vanadium	63.9	6.5	mg/kg	1	03/18/19	03/19/19	ND	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA46328
(2) Prep QC Batch: MP13172

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A9(0.0-0.5)		
Lab Sample ID:	JC84633-2A	**Date Sampled:**	03/18/19
Matrix:	SO - Soil	**Date Received:**	03/18/19
		Percent Solids:	78.7
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	94.5	1.8	mg/kg	1	04/01/19 13:47	RI	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A9(2.0-2.5)		
Lab Sample ID:	JC84633-3A	**Date Sampled:**	03/18/19
Matrix:	SO - Soil	**Date Received:**	03/18/19
		Percent Solids:	68.5
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 2.9	2.9	mg/kg	1	03/18/19	03/19/19	ND	SW846 6010D [1]	SW846 3050B [2]
Chromium	34.0	1.4	mg/kg	1	03/18/19	03/19/19	ND	SW846 6010D [1]	SW846 3050B [2]
Nickel	40.6	5.7	mg/kg	1	03/18/19	03/19/19	ND	SW846 6010D [1]	SW846 3050B [2]
Thallium	< 1.4	1.4	mg/kg	1	03/18/19	03/19/19	ND	SW846 6010D [1]	SW846 3050B [2]
Vanadium	38.0	7.2	mg/kg	1	03/18/19	03/19/19	ND	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA46328
(2) Prep QC Batch: MP13172

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A9(2.0-2.5)		
Lab Sample ID:	JC84633-3A	**Date Sampled:**	03/18/19
Matrix:	SO - Soil	**Date Received:**	03/18/19
		Percent Solids:	68.5
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	32.4	2.0	mg/kg	1	04/01/19 13:47	RI	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A9(4.0-4.5)		
Lab Sample ID:	JC84633-4A	**Date Sampled:**	03/18/19
Matrix:	SO - Soil	**Date Received:**	03/18/19
		Percent Solids:	83.8
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 2.3	2.3	mg/kg	1	03/18/19	03/19/19	GT	SW846 6010D [1]	SW846 3050B [2]
Chromium	33.8	1.1	mg/kg	1	03/18/19	03/19/19	GT	SW846 6010D [1]	SW846 3050B [2]
Nickel	17.2	4.6	mg/kg	1	03/18/19	03/19/19	GT	SW846 6010D [1]	SW846 3050B [2]
Thallium	< 1.1	1.1	mg/kg	1	03/18/19	03/19/19	GT	SW846 6010D [1]	SW846 3050B [2]
Vanadium	31.1	5.7	mg/kg	1	03/18/19	03/19/19	GT	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA46330
(2) Prep QC Batch: MP13172

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A9(4.0-4.5)		
Lab Sample ID:	JC84633-4A	**Date Sampled:**	03/18/19
Matrix:	SO - Soil	**Date Received:**	03/18/19
		Percent Solids:	83.8
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	27.8	1.6	mg/kg	1	04/01/19 13:47	RI	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A9(5.5-6.0)		
Lab Sample ID:	JC84633-5A	**Date Sampled:**	03/18/19
Matrix:	SO - Soil	**Date Received:**	03/18/19
		Percent Solids:	85.5
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 2.3	2.3	mg/kg	1	03/18/19	03/19/19	GT	SW846 6010D [1]	SW846 3050B [2]
Chromium	55.7	1.2	mg/kg	1	03/18/19	03/19/19	GT	SW846 6010D [1]	SW846 3050B [2]
Nickel	21.5	4.7	mg/kg	1	03/18/19	03/19/19	GT	SW846 6010D [1]	SW846 3050B [2]
Thallium	< 1.2	1.2	mg/kg	1	03/18/19	03/19/19	GT	SW846 6010D [1]	SW846 3050B [2]
Vanadium	34.6	5.8	mg/kg	1	03/18/19	03/19/19	GT	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA46330
(2) Prep QC Batch: MP13172

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A9(5.5-6.0)		
Lab Sample ID:	JC84633-5A	**Date Sampled:**	03/18/19
Matrix:	SO - Soil	**Date Received:**	03/18/19
		Percent Solids:	85.5
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	54.0	1.7	mg/kg	1	04/01/19 13:42	RI	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A10(4.0-4.5)		
Lab Sample ID:	JC84633-6A	**Date Sampled:**	03/18/19
Matrix:	SO - Soil	**Date Received:**	03/18/19
		Percent Solids:	84.2
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 2.4	2.4	mg/kg	1	03/18/19	03/19/19	ND	SW846 6010D [1]	SW846 3050B [2]
Chromium	36.4	1.2	mg/kg	1	03/18/19	03/19/19	ND	SW846 6010D [1]	SW846 3050B [2]
Nickel	15.2	4.9	mg/kg	1	03/18/19	03/19/19	ND	SW846 6010D [1]	SW846 3050B [2]
Thallium	< 1.2	1.2	mg/kg	1	03/18/19	03/19/19	ND	SW846 6010D [1]	SW846 3050B [2]
Vanadium	31.7	6.1	mg/kg	1	03/18/19	03/19/19	ND	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA46328
(2) Prep QC Batch: MP13172

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A10(4.0-4.5)		
Lab Sample ID:	JC84633-6A	**Date Sampled:**	03/18/19
Matrix:	SO - Soil	**Date Received:**	03/18/19
		Percent Solids:	84.2
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	36.0	1.7	mg/kg	1	04/01/19 13:47	RI	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID: SW-A10(6.0-6.5)
Lab Sample ID: JC84633-7A
Matrix: SO - Soil
Project: PPG Site 107, 18 Chapel Avenue, Jersey City, NJ

Date Sampled: 03/18/19
Date Received: 03/18/19
Percent Solids: 78.0

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 2.5	2.5	mg/kg	1	03/18/19	03/19/19	GT	SW846 6010D [1]	SW846 3050B [2]
Chromium	23.9	1.2	mg/kg	1	03/18/19	03/19/19	GT	SW846 6010D [1]	SW846 3050B [2]
Nickel	20.0	5.0	mg/kg	1	03/18/19	03/19/19	GT	SW846 6010D [1]	SW846 3050B [2]
Thallium	< 1.2	1.2	mg/kg	1	03/18/19	03/19/19	GT	SW846 6010D [1]	SW846 3050B [2]
Vanadium	35.7	6.2	mg/kg	1	03/18/19	03/19/19	GT	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA46330
(2) Prep QC Batch: MP13172

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A10(6.0-6.5)		
Lab Sample ID:	JC84633-7A	**Date Sampled:**	03/18/19
Matrix:	SO - Soil	**Date Received:**	03/18/19
		Percent Solids:	78.0
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	23.0	1.7	mg/kg	1	04/01/19 13:47	RI	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A10(7.5-8.0)		
Lab Sample ID:	JC84633-8A	**Date Sampled:**	03/18/19
Matrix:	SO - Soil	**Date Received:**	03/18/19
		Percent Solids:	79.7
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 2.6	2.6	mg/kg	1	03/18/19	03/19/19	GT	SW846 6010D [1]	SW846 3050B [2]
Chromium	17.7	1.3	mg/kg	1	03/18/19	03/19/19	GT	SW846 6010D [1]	SW846 3050B [2]
Nickel	15.1	5.1	mg/kg	1	03/18/19	03/19/19	GT	SW846 6010D [1]	SW846 3050B [2]
Thallium	< 1.3	1.3	mg/kg	1	03/18/19	03/19/19	GT	SW846 6010D [1]	SW846 3050B [2]
Vanadium	21.1	6.4	mg/kg	1	03/18/19	03/19/19	GT	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA46330
(2) Prep QC Batch: MP13172

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A10(7.5-8.0)		
Lab Sample ID:	JC84633-8A	**Date Sampled:**	03/18/19
Matrix:	SO - Soil	**Date Received:**	03/18/19
		Percent Solids:	79.7
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	16.4	1.8	mg/kg	1	04/01/19 13:47	RI	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

SGS

50 FB

CHAIN OF CUSTODY

SGS North America Inc. - Dayton
2235 Route 130, Dayton, NJ 08810
TEL. 732-329-0200 FAX: 732-329-3499/3480
www.sgs.com/ehsusa

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FED-EX Tracking #
Bottle Order Control # AK-03519-108
SGS Quote #
SGS Job # JC85175

Client / Reporting Information
Company Name: Arcadis
Street Address: 10 Friend Lane
City: Newtown State: PA
Project Contact: Krista Meskovcda
Phone #
Sampler(s) Name(s): Christa C. Felti Phone #: 201.264.8665

Project Information
Project Name: PPG Jersey City Site 107
Street: 18 Chapel Ave.
City: Jersey City State: NJ
Project #: NP000770.0001
Client Purchase Order #
Project Manager: Jim McLaughlin
Billing Information (if different from Report to)
Company Name
Street Address
City State Zip
Attention:

Requested Analysis: Total Chromium, Trivalent Chromium, Hexavalent Chromium, Antimony, Nickel, Thallium, Vanadium

SGS Sample #	Field ID / Point of Collection	MEOH/DI Vial #	Date	Time	Sampled by	Grab (G) Comp (C)	Matrix	# of bottles	HCl	NaOH	HNO3	H2SO4	NONE	DI Water	MEOH	ENCORE	Total Chromium	Trivalent Chromium	Hexavalent Chromium	Antimony	Nickel	Thallium	Vanadium	LAB USE ONLY
1	FB(20190326)		3/26/19	1145	CC	G	FB	2			1		1				X	X	X	X	X	X	X	A16
2	SW-A58 (0.0-0.5)		3/26/19	1330	CC	G	SO	1					1				X	X	X	X	X	X	X	M5
3	SW-A58 (2.0-2.5)		3/26/19	1335	CC	G	SO	1					1				X	X	X	X	X	X	X	D24
4	SW-A58 (4.0-4.5)		3/26/19	1340	CC	G	SO	1					1				X	X	X	X	X	X	X	
5	SW-A58 (5.0-5.5)		3/26/19	1345	CC	G	SO	1					1				X	X	X	X	X	X	X	
6	BS-IS		3/26/19	1350	CC	G	SO	1					1				X	X	X	X	X	X	X	
7	107-D019		3/26/19	1355	CC	G	SO	1					1				X	X	X	X	X	X	X	

Matrix Codes: DW - Drinking Water, GW - Ground Water, WW - Water, SW - Surface Water, SO - Soil, SL - Sludge, SED - Sediment, OI - Oil, LIQ - Other Liquid, AIR - Air, SOL - Other Solid, WP - Wipe, FB - Field Blank, EB - Equipment Blank, RB - Rinse Blank, TB - Trip Blank

Turn Around Time (Business Days)
- [ ] 10 Business Days
- [ ] 5 Business Days
- [ ] 3 Business Days*
- [x] 2 Business Days*
- [ ] 1 Business Day*
- [ ] Other

Approved By (SGS PM): / Date:
All data available via Lablink
* Approval needed for 1-3 Business Day TAT

Deliverable
- [ ] Commercial "A" (Level 1)
- [ ] Commercial "B" (Level 2)
- [ ] NJ Reduced (Level 3)
- [ ] Full Tier I (Level 4)
- [ ] Commercial "C"
- [ ] NJ DKQP
- [ ] NYASP Category A
- [ ] NYASP Category B
- [ ] MA MCP Criteria
- [ ] CT RCP Criteria
- [ ] State Forms
- [x] EDD Format EQuIS
- [ ] DOD-QSM5

Commercial "A" = Results only; Commercial "B" = Results + QC Summary
Commercial "C" = Results + QC Summary + Partial Raw data

Comments / Special Instructions
http://www.sgs.com/en/terms-and-conditions

Sample Custody must be documented below each time samples change possession, including courier delivery.

Relinquished by:	Date / Time:	Received By:	Relinquished By:	Date / Time:	Received By:
1 [signature]	3/26/19 1441	1 Robert Chambers	2 Robert Chambers	3.26.19 1659	2 [signature]
3		3	4		4
5		5	Custody Seal # 23212	☐ Intact ☐ Not intact; Preserved where applicable ☐ Absent; Therm. ID:	On Ice ☒ Cooler Temp. °C IG 3.2°C

INITIAL ASESSMENT [initials] 2B

LABEL VERIFICATION

?2-FORM-Dayon - Standard COC.xlsx

JC85175: Chain of Custody
Page 1 of 3

5.2
5

Report of Analysis

Client Sample ID:	FB(20190326)		
Lab Sample ID:	JC85175-1	**Date Sampled:**	03/26/19
Matrix:	AQ - Field Blank Soil	**Date Received:**	03/26/19
		Percent Solids:	n/a
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	< 0.010	0.010	mg/l	1	03/26/19 23:10	JO	SW846 7196A
Redox Potential Vs H2	472		mv	1	03/29/19 20:30	EB	ASTM D1498-76
pH [a]	4.48		su	1	03/26/19 19:17	AS	SM4500H+ B-11

(a) Sample received out of holding time for pH analysis.

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A58(0.0-0.5)		
Lab Sample ID:	JC85175-2	**Date Sampled:**	03/26/19
Matrix:	SO - Soil	**Date Received:**	03/26/19
		Percent Solids:	82.3
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	36.7	0.49	mg/kg	1	04/02/19 12:51	RI	SW846 3060A/7196A
Redox Potential Vs H2	300		mv	1	04/01/19 02:00	EB	ASTM D1498-76M
Solids, Percent	82.3		%	1	03/27/19 08:58	RC	SM2540 G 18TH ED MOD
pH	7.03 J		su	1	04/02/19 02:00	EB	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A58(2.0-2.5)		
Lab Sample ID:	JC85175-3	**Date Sampled:**	03/26/19
Matrix:	SO - Soil	**Date Received:**	03/26/19
		Percent Solids:	82.5
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	< 0.48	0.48	mg/kg	1	04/02/19 12:51	RI	SW846 3060A/7196A
Redox Potential Vs H2	308		mv	1	04/01/19 02:15	EB	ASTM D1498-76M
Solids, Percent	82.5		%	1	03/27/19 08:58	RC	SM2540 G 18TH ED MOD
pH	5.55 J		su	1	04/02/19 02:15	EB	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A58(4.0-4.5)		
Lab Sample ID:	JC85175-4	**Date Sampled:**	03/26/19
Matrix:	SO - Soil	**Date Received:**	03/26/19
		Percent Solids:	90.4
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	< 0.44	0.44	mg/kg	1	04/02/19 12:43	RI	SW846 3060A/7196A
Redox Potential Vs H2	327		mv	1	04/01/19 02:30	EB	ASTM D1498-76M
Solids, Percent	90.4		%	1	03/27/19 08:58	RC	SM2540 G 18TH ED MOD
pH	5.95 J		su	1	04/02/19 02:30	EB	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A58(5.0-5.5)		
Lab Sample ID:	JC85175-5	**Date Sampled:**	03/26/19
Matrix:	SO - Soil	**Date Received:**	03/26/19
		Percent Solids:	86.2
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	< 0.46	0.46	mg/kg	1	04/02/19 12:51	RI	SW846 3060A/7196A
Redox Potential Vs H2	336		mv	1	04/01/19 02:36	EB	ASTM D1498-76M
Solids, Percent	86.2		%	1	03/27/19 08:58	RC	SM2540 G 18TH ED MOD
pH	6.59 J		su	1	04/02/19 02:36	EB	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-J5		
Lab Sample ID:	JC85175-6	**Date Sampled:**	03/26/19
Matrix:	SO - Soil	**Date Received:**	03/26/19
		Percent Solids:	89.5
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	0.57	0.45	mg/kg	1	04/02/19 12:51	RI	SW846 3060A/7196A
Redox Potential Vs H2	321		mv	1	04/01/19 02:45	EB	ASTM D1498-76M
Solids, Percent	89.5		%	1	03/27/19 08:58	RC	SM2540 G 18TH ED MOD
pH	7.69 J		su	1	04/02/19 02:45	EB	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID: 107_D019
Lab Sample ID: JC85175-7
Matrix: SO - Soil
Project: PPG Site 107, 18 Chapel Avenue, Jersey City, NJ

Date Sampled: 03/26/19
Date Received: 03/26/19
Percent Solids: 93.0

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	< 0.43	0.43	mg/kg	1	04/02/19 12:51	RI	SW846 3060A/7196A
Redox Potential Vs H2	317		mv	1	04/01/19 02:55	EB	ASTM D1498-76M
Solids, Percent	93		%	1	03/27/19 08:58	RC	SM2540 G 18TH ED MOD
pH	6.89 J		su	1	04/02/19 02:55	EB	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID: FB(20190326)
Lab Sample ID: JC85175-1A
Matrix: AQ - Field Blank Soil
Project: PPG Site 107, 18 Chapel Avenue, Jersey City, NJ

Date Sampled: 03/26/19
Date Received: 03/26/19
Percent Solids: n/a

Total Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 6.0	6.0	ug/l	1	03/27/19	03/27/19	ND	SW846 6010D [1]	SW846 3010A [2]
Chromium	< 10	10	ug/l	1	03/27/19	03/27/19	ND	SW846 6010D [1]	SW846 3010A [2]
Nickel	< 10	10	ug/l	1	03/27/19	03/27/19	ND	SW846 6010D [1]	SW846 3010A [2]
Thallium	< 10	10	ug/l	1	03/27/19	03/27/19	ND	SW846 6010D [1]	SW846 3010A [2]
Vanadium	< 50	50	ug/l	1	03/27/19	03/27/19	ND	SW846 6010D [1]	SW846 3010A [2]

(1) Instrument QC Batch: MA46374
(2) Prep QC Batch: MP13520

RL = Reporting Limit

Report of Analysis

Client Sample ID:	FB(20190326)		
Lab Sample ID:	JC85175-1A	**Date Sampled:**	03/26/19
Matrix:	AQ - Field Blank Soil	**Date Received:**	03/26/19
		Percent Solids:	n/a
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	< 0.020	0.020	mg/l	1	03/27/19 16:55	ND	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A58(0.0-0.5)		
Lab Sample ID:	JC85175-2A	**Date Sampled:**	03/26/19
Matrix:	SO - Soil	**Date Received:**	03/26/19
		Percent Solids:	82.3
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	2.8 J-	2.4	mg/kg	1	03/26/19	03/27/19	ND	SW846 6010D [1]	SW846 3050B [2]
Chromium	111	1.2	mg/kg	1	03/26/19	03/27/19	ND	SW846 6010D [1]	SW846 3050B [2]
Nickel	25.3	4.7	mg/kg	1	03/26/19	03/27/19	ND	SW846 6010D [1]	SW846 3050B [2]
Thallium	< 1.2	1.2	mg/kg	1	03/26/19	03/27/19	ND	SW846 6010D [1]	SW846 3050B [2]
Vanadium	30.8	5.9	mg/kg	1	03/26/19	03/27/19	ND	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA46374
(2) Prep QC Batch: MP13519

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A58(0.0-0.5)		
Lab Sample ID:	JC85175-2A	**Date Sampled:**	03/26/19
Matrix:	SO - Soil	**Date Received:**	03/26/19
		Percent Solids:	82.3
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	74.3	1.7	mg/kg	1	04/02/19 12:51	RI	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID: SW-A58(2.0-2.5)
Lab Sample ID: JC85175-3A
Matrix: SO - Soil
Project: PPG Site 107, 18 Chapel Avenue, Jersey City, NJ

Date Sampled: 03/26/19
Date Received: 03/26/19
Percent Solids: 82.5

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 2.5 UJ-	2.5	mg/kg	1	03/26/19	03/27/19	ND	SW846 6010D [1]	SW846 3050B [2]
Chromium	17.4	1.2	mg/kg	1	03/26/19	03/27/19	ND	SW846 6010D [1]	SW846 3050B [2]
Nickel	15.9	4.9	mg/kg	1	03/26/19	03/27/19	ND	SW846 6010D [1]	SW846 3050B [2]
Thallium	< 1.2	1.2	mg/kg	1	03/26/19	03/27/19	ND	SW846 6010D [1]	SW846 3050B [2]
Vanadium	24.8	6.2	mg/kg	1	03/26/19	03/27/19	ND	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA46374
(2) Prep QC Batch: MP13519

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A58(2.0-2.5)		
Lab Sample ID:	JC85175-3A	**Date Sampled:**	03/26/19
Matrix:	SO - Soil	**Date Received:**	03/26/19
		Percent Solids:	82.5
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	17.4	1.7	mg/kg	1	04/02/19 12:51	RI	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID: SW-A58(4.0-4.5)
Lab Sample ID: JC85175-4A
Matrix: SO - Soil
Project: PPG Site 107, 18 Chapel Avenue, Jersey City, NJ

Date Sampled: 03/26/19
Date Received: 03/26/19
Percent Solids: 90.4

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 2.2 UJ-	2.2	mg/kg	1	03/26/19	03/27/19	ND	SW846 6010D [1]	SW846 3050B [2]
Chromium	15.5	1.1	mg/kg	1	03/26/19	03/27/19	ND	SW846 6010D [1]	SW846 3050B [2]
Nickel	14.0	4.4	mg/kg	1	03/26/19	03/27/19	ND	SW846 6010D [1]	SW846 3050B [2]
Thallium	< 1.1	1.1	mg/kg	1	03/26/19	03/27/19	ND	SW846 6010D [1]	SW846 3050B [2]
Vanadium	22.1	5.5	mg/kg	1	03/26/19	03/27/19	ND	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA46374
(2) Prep QC Batch: MP13519

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A58(4.0-4.5)		
Lab Sample ID:	JC85175-4A	**Date Sampled:**	03/26/19
Matrix:	SO - Soil	**Date Received:**	03/26/19
		Percent Solids:	90.4
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	15.5	1.5	mg/kg	1	04/02/19 12:43	RI	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID: SW-A58(5.0-5.5)
Lab Sample ID: JC85175-5A
Matrix: SO - Soil
Project: PPG Site 107, 18 Chapel Avenue, Jersey City, NJ

Date Sampled: 03/26/19
Date Received: 03/26/19
Percent Solids: 86.2

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 2.3 UJ-	2.3	mg/kg	1	03/26/19	03/27/19	ND	SW846 6010D [1]	SW846 3050B [2]
Chromium	14.4	1.2	mg/kg	1	03/26/19	03/27/19	ND	SW846 6010D [1]	SW846 3050B [2]
Nickel	12.2	4.7	mg/kg	1	03/26/19	03/27/19	ND	SW846 6010D [1]	SW846 3050B [2]
Thallium	< 1.2	1.2	mg/kg	1	03/26/19	03/27/19	ND	SW846 6010D [1]	SW846 3050B [2]
Vanadium	23.1	5.9	mg/kg	1	03/26/19	03/27/19	ND	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA46374
(2) Prep QC Batch: MP13519

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A58(5.0-5.5)		
Lab Sample ID:	JC85175-5A	**Date Sampled:**	03/26/19
Matrix:	SO - Soil	**Date Received:**	03/26/19
		Percent Solids:	86.2
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	14.4	1.7	mg/kg	1	04/02/19 12:51	RI	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID: BS-J5
Lab Sample ID: JC85175-6A
Matrix: SO - Soil
Project: PPG Site 107, 18 Chapel Avenue, Jersey City, NJ

Date Sampled: 03/26/19
Date Received: 03/26/19
Percent Solids: 89.5

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 2.1 UJ-	2.1	mg/kg	1	03/26/19	03/27/19	ND	SW846 6010D [1]	SW846 3050B [2]
Chromium	25.3	1.1	mg/kg	1	03/26/19	03/27/19	ND	SW846 6010D [1]	SW846 3050B [2]
Nickel	20.5	4.3	mg/kg	1	03/26/19	03/27/19	ND	SW846 6010D [1]	SW846 3050B [2]
Thallium	< 1.1	1.1	mg/kg	1	03/26/19	03/27/19	ND	SW846 6010D [1]	SW846 3050B [2]
Vanadium	27.8	5.4	mg/kg	1	03/26/19	03/27/19	ND	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA46374
(2) Prep QC Batch: MP13519

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-J5		
Lab Sample ID:	JC85175-6A	**Date Sampled:**	03/26/19
Matrix:	SO - Soil	**Date Received:**	03/26/19
		Percent Solids:	89.5
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	24.7	1.6	mg/kg	1	04/02/19 12:51	RI	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID: 107_D019
Lab Sample ID: JC85175-7A
Matrix: SO - Soil
Project: PPG Site 107, 18 Chapel Avenue, Jersey City, NJ

Date Sampled: 03/26/19
Date Received: 03/26/19
Percent Solids: 93.0

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 2.2 UJ-	2.2	mg/kg	1	03/26/19	03/27/19	ND	SW846 6010D [1]	SW846 3050B [2]
Chromium	10.5	1.1	mg/kg	1	03/26/19	03/27/19	ND	SW846 6010D [1]	SW846 3050B [2]
Nickel	10.7	4.3	mg/kg	1	03/26/19	03/27/19	ND	SW846 6010D [1]	SW846 3050B [2]
Thallium	< 1.1	1.1	mg/kg	1	03/26/19	03/27/19	ND	SW846 6010D [1]	SW846 3050B [2]
Vanadium	15.8	5.4	mg/kg	1	03/26/19	03/27/19	ND	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA46374
(2) Prep QC Batch: MP13519

RL = Reporting Limit

Report of Analysis

Client Sample ID:	107_D019		
Lab Sample ID:	JC85175-7A	**Date Sampled:**	03/26/19
Matrix:	SO - Soil	**Date Received:**	03/26/19
		Percent Solids:	93.0
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	10.5	1.5	mg/kg	1	04/02/19 12:51	RI	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

ARCADIS Design & Consultancy for natural and built assets

PPG Industries

DATA QUALITY ASSESSMENT

Site 107 Fashionland

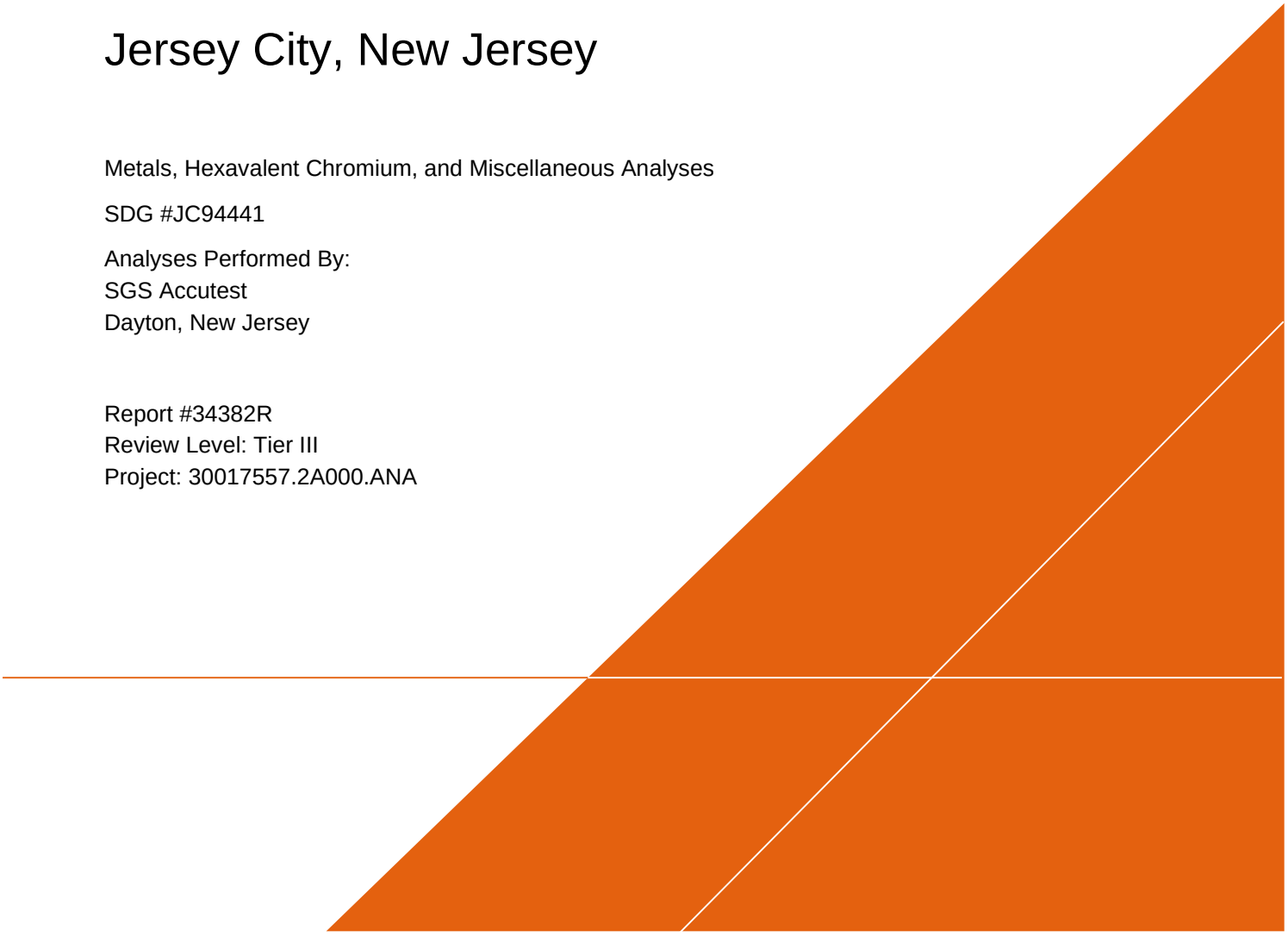
Jersey City, New Jersey

Metals, Hexavalent Chromium, and Miscellaneous Analyses

SDG #JC94441

Analyses Performed By:
SGS Accutest
Dayton, New Jersey

Report #34382R
Review Level: Tier III
Project: 30017557.2A000.ANA



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) #JC94441 for samples collected in association with the PPG Industries Site 107 Fashionland, Jersey City, New Jersey Site. The review was conducted as a Tier III evaluation and included review of data package completeness. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis		
					Cr VI	MET	MISC
FB(20190905)	JC94441-1	Water	9/5/2019		X	X	X
BS-F26	JC94441-2	Soil	9/5/2019		X	X	X
SW-A34(0.0-0.5)	JC94441-3	Soil	9/5/2019		X	X	X
SW-A34(2.0-2.5)	JC94441-4	Soil	9/5/2019		X	X	X
SW-A35(0.0-0.5)	JC94441-5	Soil	9/5/2019		X	X	X
SW-A35(2.0-2.5)	JC94441-6	Soil	9/5/2019		X	X	X
SW-A35(4.0-4.5)	JC94441-7	Soil	9/5/2019		X	X	X
SW-A35(6.0-6.5)	JC94441-8	Soil	9/5/2019		X	X	X
SW-A35(8.0-8.5)	JC94441-9	Soil	9/5/2019		X	X	X
SW-A35(10.0-10.5)	JC94441-10	Soil	9/5/2019		X	X	X
SW-A36(0.0-0.5)	JC94441-11	Soil	9/5/2019		X	X	X
SW-A36(2.0-2.5)	JC94441-12	Soil	9/5/2019		X	X	X
SW-A36(4.0-4.5)	JC94441-13	Soil	9/5/2019		X	X	X
SW-A36(6.0-6.5)	JC94441-14	Soil	9/5/2019		X	X	X
SW-A36(8.0-8.5)	JC94441-15	Soil	9/5/2019		X	X	X
DUP-33(20190905)	JC94441-16	Soil	9/5/2019	SW-A36(12.0-12.5)	X	X	X
SW-A36(10.0-10.5)	JC94441-17	Soil	9/5/2019		X	X	X
SW-A36(12.0-12.5)	JC94441-18	Soil	9/5/2019		X	X	X

Notes:

1. Metals include antimony, chromium, nickel, thallium, and vanadium. Trivalent chromium is reported by calculation (Chromium) – (Hexavalent Chromium).
2. Cr VI is hexavalent chromium.
3. Miscellaneous parameters include pH and redox potential.
4. Miscellaneous parameters for sample BS-F26 also include ferrous iron, sulfide screen, and total organic carbon (TOC).

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of QA or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

Note:
QA - Quality Assurance

INORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Methods 6010C, 6020B, 7196A, and 9045D; Standard Methods (SM) 4500H+B and SM4500S2-A; Lloyd Kahn; and ASTM D1498-76 and D3872-86. Data were reviewed in accordance with USEPA Region 2 SOP HW-2b, Revision 15 (December 2012); New Jersey Division of Remediation Management and Response Standard Operating Procedure for Analytical Data Validation of Hexavalent Chromium (September 2009); New Jersey Department of Environmental Protection Data Quality Assessment and Data Usability Evaluation Technical Guidance (April 2014); Field Sampling Plan/Quality Assurance Project Plan, PPG Non-Residential and Residential Chromium Sites, Hudson County, New Jersey (AECOM, June 2010); and Arcadis Quality Assurance Project Plan – Addendum, Site 107 Fashionland, Jersey City, New Jersey (Arcadis, June 2018).

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and that it was already subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with the USEPA National Functional Guidelines:

- Concentration (C) Qualifiers
  - U The analyte was analyzed for but not detected. The associated value is the analyte instrument detection limit.
  - B The reported value was obtained from a reading less than the reporting limit (RL), but greater than or equal to the method detection limit (MDL).
- Quantitation (Q) Qualifiers
  - E The reported value is estimated due to the presence of interference.
  - N Spiked sample recovery is not within control limits.
  - * Duplicate analysis is not within control limits.
- Validation Qualifiers
  - J The analyte was positively identified; however, the associated numerical value is an estimated concentration only.
  - J+ The result is an estimated quantity, but the result may be biased high.
  - J- The result is an estimated quantity, but the result may be biased low.
  - UJ The analyte was not detected above the reporting limit. However, the reported limit is approximate and may or may not represent the actual limit of detection.
  - UB Analyte considered non-detect at the listed value due to associated blank contamination.
  - R The data are unusable. The sample results are rejected due to serious deficiencies in meeting Quality Control (QC) critieria. The analyte may or may not be present in the sample.

Two facts should be noted by all data users. First, the “R” flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. “R” values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

METALS ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 6010C	Water	180 days from collection to analysis	Preserved to a pH of less than 2; Cool to <6°C
	Soil	180 days from collection to analysis	Cool to <6°C
SW-846 6020B	Soil	180 days from collection to analysis	Cool to <6°C

All samples were analyzed within the specified holding times.

2. Blank Contamination

Quality assurance (QA) blanks (i.e., method and rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank is calculated for QA blanks containing concentrations greater than the method detection limit (MDL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Analytes were not detected above the MDL in the associated blanks; therefore, detected sample results were not associated with blank contamination.

3. Calibration

Satisfactory instrument calibration is established to provide that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument's continuing performance is satisfactory.

3.1 Initial Calibration and Continuing Calibration

The correct number and type of standards were analyzed. The correlation coefficient of the initial calibration was greater than 0.998 and all initial calibration verification standard and continuing calibration verification standard recoveries were within control limits of 90% to 110%.

All continuing calibration verification standard recoveries were within the control limit.

3.2 Low-Level Calibration Verification

The low-level initial and continuing calibration check standard serves to verify the linearity of calibration of the analysis at the reporting limit.

All RL standard recoveries were within control limits of 70% to 130% (50% to 150% for antimony and thallium).

3.3 ICP Interference Control Sample (ICS)

The ICS verifies the laboratories interelement and background correction factors.

All ICS exhibited recoveries within the control limits of 80% to 120%.

4. Internal Standard Performance (SW-846 6020B analysis only)

Internal standard performance criteria ensure that the ICP/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard analytes associated with the metals must exhibit a percent recovery within the established acceptance limits of 60% to 125%

All internal standard responses were within control limits.

5. Matrix Spike/Matrix Spike Duplicate (MS/MSD)/Laboratory Duplicate Analysis

MS/MSD and laboratory duplicate data are used to assess the precision and accuracy of the analytical method.

5.1 MS/MSD Analysis

All metal analytes must exhibit a percent recovery within the established acceptance limits of 75% to 125%. The MS/MSD recovery control limits do not apply for MS/MSD performed on sample locations where the analyte's concentration detected in the parent sample exceeds the MS/MSD concentration by a factor of four or greater.

The MS/MSD analysis performed on sample location BS-F26 exhibited recoveries within the control limits with the exception of the analytes presented in the table below.

Sample Location	Analyte	MS Recovery	MSD Recovery
BS-F26	Antimony	64.7%	67.1%

The criteria used to evaluate MS/MSD recoveries are presented in the following table. In the case of an MS/MSD deviation, the sample results are qualified. The qualifications are applied to all sample results associated with the sample preparation batch.

Control limit	Sample Result	Qualification
MS/MSD percent recovery 30% to 74%	Non-detect	UJ-
	Detect	J-
MS/MSD percent recovery < 30%	Non-detect	R
	Detect	J-
MS/MSD percent recovery > 125%	Non-detect	No Action
	Detect	J+

5.2 Laboratory Duplicate Analysis

The laboratory duplicate relative percent difference (RPD) criterion is applied when parent and duplicate sample concentrations are greater than or equal to 5 times the RL. A control limit of 20% for water matrices and 35% for soil matrices is applied when the criteria above is true. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of ± the RL is applied.

MS/MSD analysis was performed in replacement of the laboratory duplicate analysis using sample BS-F26. The MS/MSD recoveries exhibited acceptable RPDs.

6. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 50% for soil matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of three times the RL is applied for soil matrices.

Results for duplicate samples are summarized in the following table.

Sample ID/Duplicate ID	Analyte	Sample Result	Duplicate Result	RPD
SW-A36(12.0-12.5) / DUP-33(20190905)	Chromium	62.8	61.4	2.3%
	Nickel	18.8	20.0	AC
	Vanadium	28.5	37.2	AC
	Chromium, Trivalent	58.5	57.7	1.4%

Notes

AC = Acceptable

The differences in the results between the parent sample SW-A36(12.0-12.5) and field duplicate sample DUP-33(20190905) were acceptable.

7. Laboratory Control Sample (LCS) Analysis

The LCS analysis is used to assess the accuracy of the analytical method independent of matrix interferences. The analytes associated with the LCS analysis must exhibit a percent recovery between the control limits of 80% and 120%.

The LCS analysis exhibited recoveries within the control limits.

8. Serial Dilution

The serial dilution analysis is used to assess if a significant physical or chemical interference exists due to sample matrix. Analytes exhibiting concentrations greater than 10 times the RL in the undiluted sample are evaluated to determine if matrix interference exists. These analytes are required to have less than a 10% difference (%D) between sample results from the undiluted (parent) sample and results associated with the same sample analyzed with a five-fold dilution.

The serial dilution performed on sample location BS-F26 exhibited %D within control limits.

9. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR METALS

METALS: SW-846 6010C, 6020B	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Inductively Coupled Plasma-Atomic Emission Spectrometry (ICP-AES) Inductively Coupled Plasma-Mass Spectrometry (ICP-MS)					
Tier II Validation					
Holding Times		X		X	
Reporting limits (units)		X		X	
Blanks					
A. Instrument Blanks		X		X	
B. Method Blanks		X		X	
C. Equipment/Field Blanks		X		X	
Laboratory Control Sample (LCS)		X		X	
Laboratory Control Sample Duplicate (LCSD)	X				X
LCS/LCSD Precision (RPD)	X				X
Matrix Spike (MS) %R		X	X		
Matrix Spike Duplicate (MSD) %R		X	X		
MS/MSD Precision (RPD)		X		X	
Field/Lab Duplicate (RPD)		X		X	
ICP Serial Dilution %D		X		X	
Total vs. Dissolved	X				X
Reporting Limit Verification		X		X	
Tier III Validation					
Initial Calibration Verification		X		X	
Continuing Calibration Verification		X		X	
CRDL Standard Recovery		X		X	
ICP Interference Check		X		X	
ICP-MS Internal Standards		X		X	
Transcription/calculations acceptable		X		X	
Raw Data	X				X
Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%R Percent recovery

RPD Relative percent difference

%D Percent difference

HEXAVALENT CHROMIUM ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 7196A	Water	24 hours from collection to analysis	Cool to <6°C
SW-846 3060A/ 7196A	Soil	30 days from collection to extraction; 7 days from extraction to analysis	Cool to <6°C

All samples were analyzed within the specified holding times.

2. Blank Contamination

Quality assurance (QA) blanks (i.e., method and rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank is calculated for QA blanks containing concentrations greater than the method detection limit (MDL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Analytes were not detected above the MDL in the associated blanks; therefore, detected sample results were not associated with blank contamination.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

The correct number and type of standards were analyzed. The correlation coefficient of the initial calibration was greater than 0.995 and all calibration verification standard recoveries were within control limits of 90% to 110%.

4. Matrix Spike (MS)/Post-Digestion Spike (PDS)/Laboratory Duplicate Analysis

MS, PDS, and laboratory duplicate data are used to assess the precision and accuracy of the analytical method.

4.1 MS Analysis

Soluble and insoluble spike sample analyses are designed to provide information about the effect of the sample matrix on the digestion and measurement methodology. The insoluble spike is used to evaluate the dissolution during the digestion process. Hexavalent chromium must exhibit a percent recovery within

the established acceptance limits of 75% to 125% in both the soluble and insoluble spiked analyses. The control limits do not apply when the parent sample concentration exceeds the spike amount by a factor of four or greater.

The MS analysis performed on sample location BS-F26 in association with the insoluble hexavalent chromium analysis exhibited recoveries within the control limits.

The MS analysis performed on sample location BS-F26 exhibited spike recoveries less than the lower control limits as presented in the table below.

Sample Location	Analyte	Initial Spike Recovery	Reanalysis Spike Recovery
BS-F26	Hexavalent Chromium, Soluble	69.7%	67.2%

The criteria used to evaluate spike recoveries are presented in the following table. The qualifications are applied to all sample results associated with the sample preparation batch. In the event of a recovery outside of the control limits, the MS must be reanalyzed.

Control limit	Sample Result	Qualification[1]
Spike recovery ≥ 50% but < 75%	Non-detect	UJ-
	Detect	J-
Spike recovery < 50%	Non-detect	R
	Detect	R
Spike recovery > 125%	Non-detect	No Action
Spike recovery > 125% but ≤ 150%	Detect	J+
Spike recovery > 150%	Detect	R

Notes:

[1] If recoveries are < 50% or > 150% for both insoluble and soluble spikes, associated data will be rejected ("R"); otherwise qualify associated data if one of the spikes is outside the < 50% or > 150% limits.

The original analyses of the field samples are usable with appropriate qualification. No sample results were rejected.

4.2 Post-Digestion Spike (PDS) Analysis

The PDS analysis is designed to verify that neither a reducing condition nor a chemical interference is affecting the analysis. This is accomplished by analyzing a second aliquot of the pH-adjusted filtrate that has been spiked with hexavalent chromium. The PDS must exhibit a percent recovery within the method acceptance limits of 85% to 115%.

The PDS analysis performed on sample location BS-F26 exhibited recoveries within the control limits.

4.3 Laboratory Duplicate Analysis

The laboratory duplicate relative percent difference (RPD) criterion is applied when parent and duplicate sample concentrations are greater than or equal to four times the RL. A control limit of 20% is applied

when the criteria above is true. In the instance when the parent and/or duplicate sample concentrations are less than or equal to four times the RL, a control limit of ± the RL is used.

The laboratory duplicate analysis performed on sample location BS-F26 exhibited results within the control limit.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 50% for soil matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of three times the RL is applied for soil matrices.

Results for duplicate samples are summarized in the following table.

Sample ID/Duplicate ID	Analyte	Sample Result	Duplicate Result	RPD
SW-A36(12.0-12.5) / DUP-33(20190905)	Hexavalent Chromium	4.3	3.7	15.0%

The difference in the hexavalent chromium results between the parent sample SW-A36(12.0-12.5) and field duplicate sample DUP-33(20190905) was acceptable.

6. Laboratory Control Sample (LCS) Analysis

The LCS analysis is used to assess the accuracy of the analytical method independent of matrix interferences. The analytes associated with the LCS analysis must exhibit a percent recovery between the control limits of 80% and 120%.

The LCS analysis exhibited recoveries within the control limits.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR HEXAVALENT CHROMIUM

HEXAVALENT CHROMIUM: SW-846 7196A	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Spectrophotometer					
Tier II Validation					
Holding Times		X		X	
Reporting limits (units)		X		X	
Blanks					
A. Instrument Blanks		X		X	
B. Method Blanks		X		X	
C. Equipment/Field Blanks		X		X	
Laboratory Control Sample (LCS)		X		X	
Matrix Spike (MS) %R		X	X		
Matrix Spike Duplicate (MSD) %R	X				X
MS/MSD Precision (RPD)	X				X
Post Digestion Spike %R		X		X	
Field/Lab Duplicate (RPD)		X		X	
Dilution Factor		X		X	
Tier III Validation					
Initial calibration %RSD or correlation coefficient		X		X	
Continuing calibration %R		X		X	
Raw Data		X		X	
Transcription/calculation errors present		X		X	
Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%R Percent recovery

RPD Relative percent difference

%RSD Relative percent deviation

GENERAL CHEMISTRY ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
pH by SM4500H+B	Water	QAPP: 24 hours of receipt at laboratory	Cool to <6°C
pH by SW846 9045D	Soil	QAPP: 24 hours of receipt at laboratory	Cool to <6°C
Oxidation-Reduction Potential by ASTM D1498-76	Water	Not applicable	Cool to <6°C
Oxidation-Reduction Potential (Redox) by ASTM D1498-76	Soil	Measure immediately after creating leachate	Cool to <6°C
Ferrous Iron by ASTM D3872-86	Soil	24 hours from collection to analysis	Cool to <6°C
Sulfide Screen by SM4500S2-A	Soil	7 days from collection to analysis	Cool to <6°C
Total Organic Carbon (TOC) by Lloyd Kahn	Soil	14 days from collection to analysis	Cool to <6°C

The analyses that exceeded the holding are presented in the following table.

Sample Locations	Method	Holding Time	Criteria
BS-F26 SW-A34(0.0-0.5) SW-A34(2.0-2.5) SW-A35(0.0-0.5) SW-A35(2.0-2.5) SW-A35(4.0-4.5) SW-A35(6.0-6.5) SW-A35(8.0-8.5) SW-A35(10.0-10.5) SW-A36(0.0-0.5) SW-A36(2.0-2.5) SW-A36(4.0-4.5) SW-A36(6.0-6.5) SW-A36(8.0-8.5) DUP-33(20190905) SW-A36(10.0-10.5) SW-A36(12.0-12.5)	SW846 9045D	Analysis: 4 days	< 24 hours of receipt by laboratory
BS-F26	ASTM D3872-86	Analysis: 27 days	< 24 hours from collection

Sample Locations	Method	Holding Time	Criteria
BS-F26	SM4500S2-A	Analysis: 27 days	7 days from collection
BS-F26	Lloyd Kahn	Analysis: 20 days	14 days from collection

Sample results were qualified as specified in the table below. All other holding times were met.

Criteria	Qualification	
	Detected Analytes	Non-detect Analytes
Analysis completed less than two times holding time	J	UJ
Analysis completed greater than two times holding time	J	R

2. Blank Contamination

Quality assurance (QA) blanks (i.e., method and rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank is calculated for QA blanks containing concentrations greater than the method detection limit (MDL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Method blank analysis is not applicable for Redox and pH analyses.

Ferrous iron, sulfide, and TOC were not detected above the MDL in the associated blanks; therefore, detected sample results were not associated with blank contamination.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

The correct number and type of standards were analyzed. All buffer check results were within acceptance limits.

4. Laboratory Duplicate Analysis

Laboratory duplicate data are used to assess the precision of the analytical method. The laboratory duplicate relative percent difference (RPD) criterion is applied when parent and duplicate sample concentrations are greater than or equal to 5 times the RL. A control limit of 20% for water matrices and 35% for soil matrices is applied when the criteria above is true. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of ± the RL is applied.

The laboratory duplicate analysis performed on sample locations BS-F26 exhibited results within the control limit.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 50% for soil matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of three times the RL is applied for soil matrices.

Results for duplicate samples are summarized in the following table.

Sample ID/Duplicate ID	Analyte	Sample Result	Duplicate Result	RPD
SW-A36(12.0-12.5) / DUP-33(20190905)	Redox Potential	360	368	2.2%
	pH	7.63	7.76	1.7%

The differences in the results between the parent sample SW-A36(12.0-12.5) and field duplicate sample DUP-33(20190905) were acceptable.

6. Laboratory Control Sample (LCS) Analysis

The LCS analysis is used to assess the precision and accuracy of the analytical method independent of matrix interferences. The analytes associated with the LCS analysis must exhibit a percent recovery between the control limits of 80% and 120%.

LCS results for redox potential, pH, and sulfide screen were not reported in the analytical report.

The LCS analysis performed in association with ferrous iron and TOC exhibited recoveries within the control limits.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR GENERAL CHEMISTRY

General Chemistry: SM4500H+B, SW846 9045D, ASTM D1498-76	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Miscellaneous Instrumentation					
Tier II Validation					
Holding times		X	X		
Reporting limits (units)		X		X	
Blanks					
A. Instrument Blanks		X		X	
B. Method blanks		X		X	
C. Equipment blanks		X		X	
Laboratory Control Sample (LCS) %R		X		X	
Laboratory Control Sample Duplicate (LCSD) %R	X				X
LCS/LCSD Precision (RPD)	X				X
Matrix Spike (MS) %R	X				X
Matrix Spike Duplicate (MSD) %R	X				X
MS/MSD Precision (RPD)	X				X
Field/Lab Duplicate (RPD)		X		X	
Dilution Factor		X		X	
Tier III Validation					
Initial calibration %RSD or correlation coefficient		X		X	
Continuing calibration %R		X		X	
Raw Data		X		X	
Transcription/calculation errors present		X		X	
Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%R Percent recovery
RPD Relative percent difference

VALIDATION PERFORMED BY: Jennifer Singer

SIGNATURE: 

DATE: October 11, 2019

PEER REVIEW: Dennis Capria

DATE: October 11, 2019

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

SGS North America Inc. - Dayton
2235 Route 130, Dayton, NJ 08810
TEL. 732-329-0200 FAX: 732-329-3499/3480
www.sgs.com/ehsusa

SO FB

Page 1 of __

E

FED-EX Tracking #: | Bottle Order Control #:
SGS Quote #: | SGS Job #: JC94441

Client / Reporting Information

Company Name: Arcadis
Street Address: 10 Friends Lane
City: Newtown | State: PA | Zip: 18940
Project Contact: Krista Mastrocola | E-mail:
Phone #: (610) - 755 - 7080
Sampler(s) Name(s): | Phone #:

Project Information

Project Name: PPG Jersey City Site 107
Street: 18 Chapel Ave
City: Jersey City | State: NJ
Project #: NP000770.0003.1000
Client Purchase Order #:
Project Manager: Jim McLaughlin

Billing Information (if different from Report to)

Company Name:
Street Address:
City: | State: | Zip:
Attention:

Requested Analysis

Total Chromium; Trivalent Chromium; Hexavalent Chromium; Antimony; Nickel; Thallium; Vanadium

Matrix Codes

DW - Drinking Water
GW - Ground Water
WW - Water
SW - Surface Water
SO - Soil
SL - Sludge
SED-Sediment
OI - Oil
LIQ - Other Liquid
AIR - Air
SOL - Other Solid
WP - Wipe
FB - Field Blank
EB-Equipment Blank
RB - Rinse Blank
TB - Trip Blank

SGS Sample #	Field ID / Point of Collection	MEOH/DI Vial #	Collection Date	Collection Time	Sampled by	Grab (G) Comp (C)	Matrix	# of bottles	Number of preserved Bottles: HCl	NaOH	HNO_3	H_2SO_4	NONE	DI Water	MEOH	ENCORE	LAB USE ONLY
1	FB(20190905)		9/5/19	0645	CC	G	FB	2			1		1				96
2	RS-F26		9/5/19	1235	CC	G	SO	1					1				413
3	SW-A34(0.0-0.5)		9/5/19	0900	CC	G	SO	1					1				
4	SW-A34(2.0-2.5)		9/5/19	0920	CC	G	SO	1					1				
5	SW-A35(0.0-0.5)		9/5/19	1110	CC	G	SO	1					1				
6	SW-A35(2.0-2.5)		9/5/19	1120	CC	G	SO	1					1				
7	SW-A35(4.0-4.5)		9/5/19	1130	CC	G	SO	1					1				
8	SW-A35(6.0-6.5)		9/5/19	1140	CC	G	SO	1					1				
9	SW-A35(8.0-8.5)		9/5/19	1150	CC	G	SO	1					1				
10	SW-A35(18.0-18.5)		9/5/19	1200	CC	G	SO	1					1				
11	SW-A36(0.0-0.5)		9/5/19	1000	CC	G	SO	1					1				
12	SW-A36(2.0-2.5)		9/5/19	1010	CC	G	SO	1					1				

Turn Around Time (Business Days)

Approved By (SGS PM): / Date:

- [ ] 10 Business Days
- [ ] 5 Business Days
- [ ] 3 Business Days*
- [x] 2 Business Days*
- [ ] 1 Business Day*
- [ ] Other

All data available via Lablink

* Approval needed for 1-3 Business Day TAT

Deliverable

- [ ] Commercial "A" (Level 1)
- [ ] Commercial "B" (Level 2)
- [ ] NJ Reduced (Level 3)
- [ ] Full Tier I (Level 4)
- [ ] Commercial "C"
- [ ] NJ DKQP
- [ ] NYASP Category A
- [ ] NYASP Category B
- [ ] MA MCP Criteria_____
- [ ] CT RCP Criteria_____
- [ ] State Forms
- [x] EDD Format EQUIS
- [ ] DOD-QSM5

Commercial "A" = Results only; Commercial "B" = Results + QC Summary
Commercial "C" = Results + QC Summary + Partial raw data

Comments / Special Instructions

INITIAL ASESSMENT 4B Dcm
LABEL VERIFICATION_____

http://www.sgs.com/en/terms-and-conditions

Sample Custody must be documented below each time samples change possession, including courier delivery.

	Relinquished by:	Date / Time:	Received By:
1	[signature]	9/5/19 1327	[signature]
2	[signature]	9/5/19 1651	[signature]
3			
4			
5			

Custody Seal # 16268 | Intact | Not intact | Preserved where applicable | Absent | Therm. ID: | On Ice X | Cooler Temp. °C 2.7-1.0

EHSA-QAC-0023-02-FORM-Dayton - Standard COC.xlsx

5.2 5

CHAIN OF CUSTODY

SGS North America Inc. - Dayton
2235 Route 130, Dayton, NJ 08810
TEL. 732-329-0200 FAX: 732-329-3499/3480
www.sgs.com/ehsusa

Page 2 of __

FED-EX Tracking #: | Bottle Order Control #:
SGS Quote #: | SGS Job #: JC94441

Client / Reporting Information

Company Name: Arcadis
Street Address: 10 Friends Lane
City: Newtown State: PA Zip: 18940
Project Contact: Krista Mastrocola E-mail:
Phone #: (610-755-7080
Sampler(s) Name(s): Phone #:

Project Information

Project Name: PPG Jersey City Site 107
Street: 18 Chapel Ave
City: Jersey City State: NJ
Project #: NP000770.0003.11000
Client Purchase Order #:
Project Manager: Jim McLaughlin

Billing Information (if different from Report to)

Company Name:
Street Address:
City: State: Zip:
Attention:

Requested Analysis

Matrix Codes: DW - Drinking Water; GW - Ground Water; WW - Water; SW - Surface Water; SO - Soil; SL- Sludge; SED-Sediment; OI - Oil; LIQ - Other Liquid; AIR - Air; SOL - Other Solid; WP - Wipe; FB - Field Blank; EB-Equipment Blank; RB - Rinse Blank; TB - Trip Blank

SGS Sample #	Field ID / Point of Collection	MEOH/DI Vial #	Collection Date	Collection Time	Sampled by	Grab (G) Comp (C)	Matrix	# of bottles	Number of preserved Bottles: HCl	NaOH	HNO_3	H_2SO_4	NONE	DI Water	MEOH	ENCORE	Total chromium	Trivalent chromium	Hexavalent chromium	Antimony	Nickel	Thallium	Vanadium	LAB USE ONLY
13	SW-A36(4.0-4.5)		9/5/19	1020	CC	G	SO	1						1			X	X	X	X	X	X	X	
14	SW-A36(6.0-6.5)		9/5/19	1030	CC	G	SO	1						1			X	X	X	X	X	X	X	
15	SW-A36(8.0-8.5)		9/5/19	1040	CC	G	SO	1						1			X	X	X	X	X	X	X	
2 (BS-F26 MS)	~~SW-A36(2.0-2.5)~~	BS-F26MS	9/5/19	1235	CC	G	SO	1						1			X	X	X	X	X	X	X	
(BS-F26 MSD)	~~SW-A36(2.0-2.5)~~	BS-F26MSD	9/5/19	1235	CC	G	SO	1						1			X	X	X	X	X	X	X	
16	DUP-33(20190905)		9/5/19	—	CC	G	SO	1						1			X	X	X	X	X	X	X	
17	SW-A36(10.0-10.5)		9/5/19	1050	CC	G	SO	1						1			X	X	X	X	X	X	X	
18	SW-A36(12.0-12.5)		9/5/19	1100	CC	G	SO	1						1			X	X	X	X	X	X	X	

Turn Around Time (Business Days)

Approved By (SGS PM): / Date:

- [ ] 10 Business Days
- [ ] 5 Business Days
- [ ] 3 Business Days
- [x] 2 Business Days
- [ ] 1 Business Day
- [ ] Other

All data available via Lablink

* Approval needed for 1-3 Business Day TAT

Deliverable

- [ ] Commercial "A" (Level 1)
- [ ] Commercial "B" (Level 2)
- [ ] NJ Reduced (Level 3)
- [ ] Full Tier I (Level 4)
- [ ] Commercial "C"
- [ ] NJ DKQP
- [ ] NYASP Category A
- [ ] NYASP Category B
- [ ] MA MCP Criteria
- [ ] CT RCP Criteria
- [ ] State Forms
- [x] EDD Format EQUIS
- [ ] DOD-QSM5

Commercial "A" = Results only; Commercial "B" = Results + QC Summary
Commercial "C" = Results + QC Summary + Partial Raw data

Comments / Special Instructions

http://www.sgs.com/en/terms-and-conditions

Sample Custody must be documented below each time samples change possession, including courier delivery.

	Relinquished by:	Date / Time:	Received By:
1		9/5/19 1327	
2		9/5/19 1657	
3			
4			
5			

Custody Seal #: 03944 Intact / Not intact
Preserved where applicable: Absent / Therm. ID:
On Ice: X
Cooler Temp. °C: 4.7 4.7

EHSA-QAC-0023-02-FORM-Dayton - Standard COC.xlsx

Report of Analysis

Client Sample ID:	FB(20190905)		
Lab Sample ID:	JC94441-1	**Date Sampled:**	09/05/19
Matrix:	AQ - Field Blank Soil	**Date Received:**	09/05/19
		Percent Solids:	n/a
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	< 0.010	0.010	mg/l	1	09/05/19 23:24	EB	SW846 7196A
Redox Potential Vs H2	328		mv	1	09/09/19 14:43	MS	ASTM D1498-76
pH [a]	5.49		su	1	09/04/19 17:20	AS	SM4500H+ B-11

(a) Sample received out of holding time for pH analysis.

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-F26		
Lab Sample ID:	JC94441-2	**Date Sampled:**	09/05/19
Matrix:	SO - Soil	**Date Received:**	09/05/19
		Percent Solids:	87.0
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	0.54 J-	0.46	mg/kg	1	09/09/19 15:38	NV	SW846 3060A/7196A
Redox Potential Vs H2	325		mv	1	09/09/19 11:45	MS	ASTM D1498-76M
Solids, Percent	87		%	1	09/08/19 14:10	BG	SM2540 G 18TH ED MOD
pH	8.18 J		su	1	09/09/19 11:45	MS	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-F26		
Lab Sample ID:	JC94441-2R	**Date Sampled:**	09/05/19
Matrix:	SO - Soil	**Date Received:**	09/05/19
		Percent Solids:	87.0
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	1.1	0.46	mg/kg	1	09/20/19 22:26	EB	SW846 3060A/7196A

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-F26		
Lab Sample ID:	JC94441-2RT	**Date Sampled:**	09/05/19
Matrix:	SO - Soil	**Date Received:**	09/05/19
		Percent Solids:	87.0
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Iron, Ferrous [a]	0.77 J	0.20	%	1	10/02/19 12:44	MP	ASTM D3872-86
~~Sulfide Screen~~ [b]	~~NEGATIVE~~			~~1~~	~~10/02/19 12:44~~	~~MP~~	~~SM4500S2- A-11~~ R
Total Organic Carbon [c]	1350 J	110	mg/kg	1	09/25/19 14:56	CD	LLOYD KAHN 1988 MOD

(a) The ferrous iron test was analyzed after completion of Cr6 testing (outside of normal hold times for this parameter) in order to provide more information about the possible impact of the sample matrix on Cr6 recoveries.
(b) The sulfide screen test was analyzed after completion of Cr6 testing (outside of normal hold times for this parameter) in order to provide more information about the possible impact of the sample matrix on Cr6 recoveries.
(c) Analysis done out of holding time.

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A34(0.0-0.5)		
Lab Sample ID:	JC94441-3	**Date Sampled:**	09/05/19
Matrix:	SO - Soil	**Date Received:**	09/05/19
		Percent Solids:	94.5
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	7.3 J-	0.42	mg/kg	1	09/09/19 15:46	NV	SW846 3060A/7196A
Redox Potential Vs H2	320		mv	1	09/09/19 11:46	MS	ASTM D1498-76M
Solids, Percent	94.5		%	1	09/08/19 14:10	BG	SM2540 G 18TH ED MOD
pH	7.63 J		su	1	09/09/19 11:46	MS	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A34(0.0-0.5)		
Lab Sample ID:	JC94441-3R	**Date Sampled:**	09/05/19
Matrix:	SO - Soil	**Date Received:**	09/05/19
		Percent Solids:	94.5
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	1.4	0.42	mg/kg	1	09/20/19 22:40	EB	SW846 3060A/7196A

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A34(2.0-2.5)		
Lab Sample ID:	JC94441-4	**Date Sampled:**	09/05/19
Matrix:	SO - Soil	**Date Received:**	09/05/19
		Percent Solids:	80.0
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	3.3 J-	0.50	mg/kg	1	09/09/19 15:46	NV	SW846 3060A/7196A
Redox Potential Vs H2	330		mv	1	09/09/19 11:48	MS	ASTM D1498-76M
Solids, Percent	80		%	1	09/08/19 14:10	BG	SM2540 G 18TH ED MOD
pH	7.82 J		su	1	09/09/19 11:48	MS	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A34(2.0-2.5)		
Lab Sample ID:	JC94441-4R	**Date Sampled:**	09/05/19
Matrix:	SO - Soil	**Date Received:**	09/05/19
		Percent Solids:	80.0
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	20.4	0.50	mg/kg	1	09/20/19 22:40	EB	SW846 3060A/7196A

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A35(0.0-0.5)		
Lab Sample ID:	JC94441-5	**Date Sampled:**	09/05/19
Matrix:	SO - Soil	**Date Received:**	09/05/19
		Percent Solids:	96.4
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	4.4 J-	0.41	mg/kg	1	09/09/19 15:46	NV	SW846 3060A/7196A
Redox Potential Vs H2	331		mv	1	09/09/19 11:51	MS	ASTM D1498-76M
Solids, Percent	96.4		%	1	09/08/19 14:10	BG	SM2540 G 18TH ED MOD
pH	7.94 J		su	1	09/09/19 11:51	MS	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A35(0.0-0.5)		
Lab Sample ID:	JC94441-5R	**Date Sampled:**	09/05/19
Matrix:	SO - Soil	**Date Received:**	09/05/19
		Percent Solids:	96.4
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	0.98	0.41	mg/kg	1	09/20/19 22:40	EB	SW846 3060A/7196A

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A35(2.0-2.5)		
Lab Sample ID:	JC94441-6	**Date Sampled:**	09/05/19
Matrix:	SO - Soil	**Date Received:**	09/05/19
		Percent Solids:	94.7
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	6.6 J-	0.42	mg/kg	1	09/09/19 15:46	NV	SW846 3060A/7196A
Redox Potential Vs H2	334		mv	1	09/09/19 11:52	MS	ASTM D1498-76M
Solids, Percent	94.7		%	1	09/08/19 14:10	BG	SM2540 G 18TH ED MOD
pH	7.69 J		su	1	09/09/19 11:52	MS	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A35(2.0-2.5)		
Lab Sample ID:	JC94441-6R	**Date Sampled:**	09/05/19
Matrix:	SO - Soil	**Date Received:**	09/05/19
		Percent Solids:	94.7
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	11.8	0.42	mg/kg	1	09/20/19 22:40	EB	SW846 3060A/7196A

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A35(4.0-4.5)		
Lab Sample ID:	JC94441-7	**Date Sampled:**	09/05/19
Matrix:	SO - Soil	**Date Received:**	09/05/19
		Percent Solids:	89.2
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	0.93 J-	0.45	mg/kg	1	09/09/19 15:46	NV	SW846 3060A/7196A
Redox Potential Vs H2	336		mv	1	09/09/19 11:55	MS	ASTM D1498-76M
Solids, Percent	89.2		%	1	09/08/19 14:10	BG	SM2540 G 18TH ED MOD
pH	8.03 J		su	1	09/09/19 11:55	MS	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A35(4.0-4.5)		
Lab Sample ID:	JC94441-7R	**Date Sampled:**	09/05/19
Matrix:	SO - Soil	**Date Received:**	09/05/19
		Percent Solids:	89.2
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	3.6	0.45	mg/kg	1	09/20/19 22:40	EB	SW846 3060A/7196A

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A35(6.0-6.5)		
Lab Sample ID:	JC94441-8	**Date Sampled:**	09/05/19
Matrix:	SO - Soil	**Date Received:**	09/05/19
		Percent Solids:	96.0
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	2.2 J-	0.42	mg/kg	1	09/09/19 15:46	NV	SW846 3060A/7196A
Redox Potential Vs H2	342		mv	1	09/09/19 11:56	MS	ASTM D1498-76M
Solids, Percent	96		%	1	09/08/19 14:10	BG	SM2540 G 18TH ED MOD
pH	7.31 J		su	1	09/09/19 11:56	MS	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A35(6.0-6.5)		
Lab Sample ID:	JC94441-8R	**Date Sampled:**	09/05/19
Matrix:	SO - Soil	**Date Received:**	09/05/19
		Percent Solids:	96.0
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	1.4	0.42	mg/kg	1	09/20/19 22:40	EB	SW846 3060A/7196A

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A35(8.0-8.5)		
Lab Sample ID:	JC94441-9	**Date Sampled:**	09/05/19
Matrix:	SO - Soil	**Date Received:**	09/05/19
		Percent Solids:	94.3
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	0.59 J-	0.42	mg/kg	1	09/09/19 16:35	NV	SW846 3060A/7196A
Redox Potential Vs H2	344		mv	1	09/09/19 11:59	MS	ASTM D1498-76M
Solids, Percent	94.3		%	1	09/08/19 14:10	BG	SM2540 G 18TH ED MOD
pH	7.04 J		su	1	09/09/19 11:59	MS	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A35(8.0-8.5)		
Lab Sample ID:	JC94441-9R	**Date Sampled:**	09/05/19
Matrix:	SO - Soil	**Date Received:**	09/05/19
		Percent Solids:	94.3
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	0.44	0.42	mg/kg	1	09/20/19 22:40	EB	SW846 3060A/7196A

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A35(10.0-10.5)		
Lab Sample ID:	JC94441-10	**Date Sampled:**	09/05/19
Matrix:	SO - Soil	**Date Received:**	09/05/19
		Percent Solids:	93.2
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	1.7 J-	0.43	mg/kg	1	09/09/19 16:35	NV	SW846 3060A/7196A
Redox Potential Vs H2	354		mv	1	09/09/19 11:25	MS	ASTM D1498-76M
Solids, Percent	93.2		%	1	09/08/19 14:10	BG	SM2540 G 18TH ED MOD
pH	7.40 J		su	1	09/09/19 11:25	MS	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A35(10.0-10.5)		
Lab Sample ID:	JC94441-10R	**Date Sampled:**	09/05/19
Matrix:	SO - Soil	**Date Received:**	09/05/19
		Percent Solids:	93.2
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	2.9	0.43	mg/kg	1	09/20/19 22:40	EB	SW846 3060A/7196A

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A36(0.0-0.5)		
Lab Sample ID:	JC94441-11	**Date Sampled:**	09/05/19
Matrix:	SO - Soil	**Date Received:**	09/05/19
		Percent Solids:	94.3
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	2.2 J-	0.42	mg/kg	1	09/09/19 16:35	NV	SW846 3060A/7196A
Redox Potential Vs H2	350		mv	1	09/09/19 11:27	MS	ASTM D1498-76M
Solids, Percent	94.3		%	1	09/08/19 14:10	BG	SM2540 G 18TH ED MOD
pH	7.78 J		su	1	09/09/19 11:27	MS	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A36(0.0-0.5)		
Lab Sample ID:	JC94441-11R	**Date Sampled:**	09/05/19
Matrix:	SO - Soil	**Date Received:**	09/05/19
		Percent Solids:	94.3
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	1.1	0.42	mg/kg	1	09/20/19 22:40	EB	SW846 3060A/7196A

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A36(2.0-2.5)		
Lab Sample ID:	JC94441-12	**Date Sampled:**	09/05/19
Matrix:	SO - Soil	**Date Received:**	09/05/19
		Percent Solids:	93.3
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	1.5 J-	0.43	mg/kg	1	09/09/19 16:35	NV	SW846 3060A/7196A
Redox Potential Vs H2	350		mv	1	09/09/19 11:37	MS	ASTM D1498-76M
Solids, Percent	93.3		%	1	09/08/19 14:10	BG	SM2540 G 18TH ED MOD
pH	7.81 J		su	1	09/09/19 11:37	MS	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A36(2.0-2.5)		
Lab Sample ID:	JC94441-12R	**Date Sampled:**	09/05/19
Matrix:	SO - Soil	**Date Received:**	09/05/19
		Percent Solids:	93.3
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	1.3	0.43	mg/kg	1	09/20/19 22:40	EB	SW846 3060A/7196A

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A36(4.0-4.5)		
Lab Sample ID:	JC94441-13	**Date Sampled:**	09/05/19
Matrix:	SO - Soil	**Date Received:**	09/05/19
		Percent Solids:	92.3
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	5.3 J-	0.43	mg/kg	1	09/09/19 16:35	NV	SW846 3060A/7196A
Redox Potential Vs H2	346		mv	1	09/09/19 11:40	MS	ASTM D1498-76M
Solids, Percent	92.3		%	1	09/08/19 14:10	BG	SM2540 G 18TH ED MOD
pH	7.75 J		su	1	09/09/19 11:40	MS	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A36(4.0-4.5)		
Lab Sample ID:	JC94441-13R	**Date Sampled:**	09/05/19
Matrix:	SO - Soil	**Date Received:**	09/05/19
		Percent Solids:	92.3
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	2.6	0.43	mg/kg	1	09/20/19 23:10	EB	SW846 3060A/7196A

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A36(6.0-6.5)		
Lab Sample ID:	JC94441-14	**Date Sampled:**	09/05/19
Matrix:	SO - Soil	**Date Received:**	09/05/19
		Percent Solids:	95.7
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	< 0.42 UJ-	0.42	mg/kg	1	09/09/19 16:35	NV	SW846 3060A/7196A
Redox Potential Vs H2	347		mv	1	09/09/19 11:42	MS	ASTM D1498-76M
Solids, Percent	95.7		%	1	09/08/19 14:10	BG	SM2540 G 18TH ED MOD
pH	7.74 J		su	1	09/09/19 11:42	MS	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A36(6.0-6.5)		
Lab Sample ID:	JC94441-14R	**Date Sampled:**	09/05/19
Matrix:	SO - Soil	**Date Received:**	09/05/19
		Percent Solids:	95.7
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	2.7	0.42	mg/kg	1	09/20/19 23:10	EB	SW846 3060A/7196A

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A36(8.0-8.5)		
Lab Sample ID:	JC94441-15	**Date Sampled:**	09/05/19
Matrix:	SO - Soil	**Date Received:**	09/05/19
		Percent Solids:	86.6
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	1.8 J-	0.46	mg/kg	1	09/09/19 16:35	NV	SW846 3060A/7196A
Redox Potential Vs H2	388		mv	1	09/09/19 16:53	MS	ASTM D1498-76M
Solids, Percent	86.6		%	1	09/08/19 14:10	BG	SM2540 G 18TH ED MOD
pH	7.86 J		su	1	09/09/19 16:53	MS	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A36(8.0-8.5)		
Lab Sample ID:	JC94441-15R	**Date Sampled:**	09/05/19
Matrix:	SO - Soil	**Date Received:**	09/05/19
		Percent Solids:	86.6
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	3.9	0.46	mg/kg	1	09/20/19 23:10	EB	SW846 3060A/7196A

RL = Reporting Limit

Report of Analysis

Client Sample ID:	DUP-33(20190905)		
Lab Sample ID:	JC94441-16	**Date Sampled:**	09/05/19
Matrix:	SO - Soil	**Date Received:**	09/05/19
		Percent Solids:	82.7
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	3.7 J-	0.48	mg/kg	1	09/09/19 16:35	NV	SW846 3060A/7196A
Redox Potential Vs H2	368		mv	1	09/09/19 16:58	MS	ASTM D1498-76M
Solids, Percent	82.7		%	1	09/08/19 14:10	BG	SM2540 G 18TH ED MOD
pH	7.76 J		su	1	09/09/19 16:58	MS	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID:	DUP-33(20190905)		
Lab Sample ID:	JC94441-16R	**Date Sampled:**	09/05/19
Matrix:	SO - Soil	**Date Received:**	09/05/19
		Percent Solids:	82.7
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	2.0	0.48	mg/kg	1	09/20/19 23:10	EB	SW846 3060A/7196A

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A36(10.0-10.5)		
Lab Sample ID:	JC94441-17	**Date Sampled:**	09/05/19
Matrix:	SO - Soil	**Date Received:**	09/05/19
		Percent Solids:	93.7
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	1.6 J-	0.43	mg/kg	1	09/09/19 16:35	NV	SW846 3060A/7196A
Redox Potential Vs H2	358		mv	1	09/09/19 17:01	MS	ASTM D1498-76M
Solids, Percent	93.7		%	1	09/08/19 14:10	BG	SM2540 G 18TH ED MOD
pH	7.80 J		su	1	09/09/19 17:01	MS	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A36(10.0-10.5)		
Lab Sample ID:	JC94441-17R	**Date Sampled:**	09/05/19
Matrix:	SO - Soil	**Date Received:**	09/05/19
		Percent Solids:	93.7
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	1.2	0.43	mg/kg	1	09/20/19 23:10	EB	SW846 3060A/7196A

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A36(12.0-12.5)		
Lab Sample ID:	JC94441-18	**Date Sampled:**	09/05/19
Matrix:	SO - Soil	**Date Received:**	09/05/19
		Percent Solids:	81.1
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	4.3 J-	0.49	mg/kg	1	09/09/19 16:35	NV	SW846 3060A/7196A
Redox Potential Vs H2	360		mv	1	09/09/19 17:04	MS	ASTM D1498-76M
Solids, Percent	81.1		%	1	09/08/19 14:10	BG	SM2540 G 18TH ED MOD
pH	7.63 J		su	1	09/09/19 17:04	MS	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A36(12.0-12.5)		
Lab Sample ID:	JC94441-18R	**Date Sampled:**	09/05/19
Matrix:	SO - Soil	**Date Received:**	09/05/19
		Percent Solids:	81.1
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	0.83	0.49	mg/kg	1	09/20/19 23:10	EB	SW846 3060A/7196A

RL = Reporting Limit

Report of Analysis

Client Sample ID: FB(20190905)
Lab Sample ID: JC94441-1A
Matrix: AQ - Field Blank Soil
Project: PPG Site 107, 18 Chapel Avenue, Jersey City, NJ

Date Sampled: 09/05/19
Date Received: 09/05/19
Percent Solids: n/a

Total Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 6.0	6.0	ug/l	1	09/06/19	09/07/19	EAL	SW846 6010D [1]	SW846 3010A [2]
Chromium	< 10	10	ug/l	1	09/06/19	09/07/19	EAL	SW846 6010D [1]	SW846 3010A [2]
Nickel	< 10	10	ug/l	1	09/06/19	09/07/19	EAL	SW846 6010D [1]	SW846 3010A [2]
Thallium	< 10	10	ug/l	1	09/06/19	09/07/19	EAL	SW846 6010D [1]	SW846 3010A [2]
Vanadium	< 50	50	ug/l	1	09/06/19	09/07/19	EAL	SW846 6010D [1]	SW846 3010A [2]

(1) Instrument QC Batch: MA47409
(2) Prep QC Batch: MP17164

RL = Reporting Limit

Report of Analysis

Client Sample ID:	FB(20190905)		
Lab Sample ID:	JC94441-1A	**Date Sampled:**	09/05/19
Matrix:	AQ - Field Blank Soil	**Date Received:**	09/05/19
		Percent Solids:	n/a
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	< 0.020	0.020	mg/l	1	09/07/19 03:54	EAL	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID: BS-F26
Lab Sample ID: JC94441-2A
Matrix: SO - Soil
Project: PPG Site 107, 18 Chapel Avenue, Jersey City, NJ

Date Sampled: 09/05/19
Date Received: 09/05/19
Percent Solids: 87.0

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 2.3 UJ-	2.3	mg/kg	1	09/06/19	09/06/19	EAL	SW846 6010D [1]	SW846 3050B [2]
Chromium	23.3	1.1	mg/kg	1	09/06/19	09/06/19	EAL	SW846 6010D [1]	SW846 3050B [2]
Nickel	61.4	4.6	mg/kg	1	09/06/19	09/06/19	EAL	SW846 6010D [1]	SW846 3050B [2]
Thallium	< 1.1	1.1	mg/kg	1	09/06/19	09/06/19	EAL	SW846 6010D [1]	SW846 3050B [2]
Vanadium	22.6	5.7	mg/kg	1	09/06/19	09/06/19	EAL	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA47408
(2) Prep QC Batch: MP17170

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BS-F26		
Lab Sample ID:	JC94441-2A	**Date Sampled:**	09/05/19
Matrix:	SO - Soil	**Date Received:**	09/05/19
		Percent Solids:	87.0
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	22.8	1.6	mg/kg	1	09/06/19 18:26	EAL	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A34(0.0-0.5)		
Lab Sample ID:	JC94441-3A	**Date Sampled:**	09/05/19
Matrix:	SO - Soil	**Date Received:**	09/05/19
		Percent Solids:	94.5
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 2.1 UJ-	2.1	mg/kg	1	09/06/19	09/06/19	EAL	SW846 6010D [1]	SW846 3050B [2]
Chromium	54.1	1.0	mg/kg	1	09/06/19	09/06/19	EAL	SW846 6010D [1]	SW846 3050B [2]
Nickel	26.5	4.1	mg/kg	1	09/06/19	09/06/19	EAL	SW846 6010D [1]	SW846 3050B [2]
Thallium	< 1.0	1.0	mg/kg	1	09/06/19	09/06/19	EAL	SW846 6010D [1]	SW846 3050B [2]
Vanadium	53.0	5.2	mg/kg	1	09/06/19	09/06/19	EAL	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA47408
(2) Prep QC Batch: MP17170

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A34(0.0-0.5)		
Lab Sample ID:	JC94441-3A	**Date Sampled:**	09/05/19
Matrix:	SO - Soil	**Date Received:**	09/05/19
		Percent Solids:	94.5
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	46.8	1.4	mg/kg	1	09/06/19 18:35	EAL	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A34(2.0-2.5)		
Lab Sample ID:	JC94441-4A	**Date Sampled:**	09/05/19
Matrix:	SO - Soil	**Date Received:**	09/05/19
		Percent Solids:	80.0
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony [a]	< 7.3 UJ-	7.3	mg/kg	3	09/06/19	09/06/19	EAL	SW846 6010D [1]	SW846 3050B [2]
Chromium	1250	3.6	mg/kg	3	09/06/19	09/06/19	EAL	SW846 6010D [1]	SW846 3050B [2]
Nickel	214	4.9	mg/kg	1	09/06/19	09/06/19	EAL	SW846 6010D [1]	SW846 3050B [2]
Thallium [a]	< 3.6	3.6	mg/kg	3	09/06/19	09/06/19	EAL	SW846 6010D [1]	SW846 3050B [2]
Vanadium [a]	416	18	mg/kg	3	09/06/19	09/06/19	EAL	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA47408
(2) Prep QC Batch: MP17170

(a) Elevated detection limit due to dilution required for high interfering element.

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A34(2.0-2.5)		
Lab Sample ID:	JC94441-4A	**Date Sampled:**	09/05/19
Matrix:	SO - Soil	**Date Received:**	09/05/19
		Percent Solids:	80.0
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	1250	4.1	mg/kg	1	09/06/19 21:15	EAL	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A35(0.0-0.5)		
Lab Sample ID:	JC94441-5A	**Date Sampled:**	09/05/19
Matrix:	SO - Soil	**Date Received:**	09/05/19
		Percent Solids:	96.4
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 2.1 UJ-	2.1	mg/kg	1	09/06/19	09/06/19	EAL	SW846 6010D [1]	SW846 3050B [2]
Chromium	122	1.0	mg/kg	1	09/06/19	09/06/19	EAL	SW846 6010D [1]	SW846 3050B [2]
Nickel	38.7	4.1	mg/kg	1	09/06/19	09/06/19	EAL	SW846 6010D [1]	SW846 3050B [2]
Thallium	< 1.0	1.0	mg/kg	1	09/06/19	09/06/19	EAL	SW846 6010D [1]	SW846 3050B [2]
Vanadium	63.9	5.1	mg/kg	1	09/06/19	09/06/19	EAL	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA47408
(2) Prep QC Batch: MP17170

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A35(0.0-0.5)		
Lab Sample ID:	JC94441-5A	**Date Sampled:**	09/05/19
Matrix:	SO - Soil	**Date Received:**	09/05/19
		Percent Solids:	96.4
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	118	1.4	mg/kg	1	09/06/19 18:46	EAL	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A35(2.0-2.5)		
Lab Sample ID:	JC94441-6A	**Date Sampled:**	09/05/19
Matrix:	SO - Soil	**Date Received:**	09/05/19
		Percent Solids:	94.7
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 2.1 UJ-	2.1	mg/kg	1	09/06/19	09/06/19	EAL	SW846 6010D [1]	SW846 3050B [2]
Chromium	128	1.0	mg/kg	1	09/06/19	09/06/19	EAL	SW846 6010D [1]	SW846 3050B [2]
Nickel	26.4	4.1	mg/kg	1	09/06/19	09/06/19	EAL	SW846 6010D [1]	SW846 3050B [2]
Thallium	< 1.0	1.0	mg/kg	1	09/06/19	09/06/19	EAL	SW846 6010D [1]	SW846 3050B [2]
Vanadium	42.0	5.1	mg/kg	1	09/06/19	09/06/19	EAL	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA47408
(2) Prep QC Batch: MP17170

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A35(2.0-2.5)		
Lab Sample ID:	JC94441-6A	**Date Sampled:**	09/05/19
Matrix:	SO - Soil	**Date Received:**	09/05/19
		Percent Solids:	94.7
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	121	1.4	mg/kg	1	09/06/19 18:51	EAL	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A35(4.0-4.5)		
Lab Sample ID:	JC94441-7A	**Date Sampled:**	09/05/19
Matrix:	SO - Soil	**Date Received:**	09/05/19
		Percent Solids:	89.2
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony [a]	< 4.5 UJ-	4.5	mg/kg	2	09/06/19	09/09/19	GT	SW846 6010D [2]	SW846 3050B [3]
Chromium	661	1.1	mg/kg	1	09/06/19	09/06/19	EAL	SW846 6010D [1]	SW846 3050B [3]
Nickel	106	4.5	mg/kg	1	09/06/19	09/06/19	EAL	SW846 6010D [1]	SW846 3050B [3]
Thallium [a]	< 2.2	2.2	mg/kg	2	09/06/19	09/09/19	GT	SW846 6010D [2]	SW846 3050B [3]
Vanadium	187	5.6	mg/kg	1	09/06/19	09/06/19	EAL	SW846 6010D [1]	SW846 3050B [3]

(1) Instrument QC Batch: MA47408
(2) Instrument QC Batch: MA47415
(3) Prep QC Batch: MP17170

(a) Elevated detection limit due to dilution required for high interfering element.

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A35(4.0-4.5)		
Lab Sample ID:	JC94441-7A	**Date Sampled:**	09/05/19
Matrix:	SO - Soil	**Date Received:**	09/05/19
		Percent Solids:	89.2
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	660	1.6	mg/kg	1	09/06/19 21:20	EAL	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A35(6.0-6.5)		
Lab Sample ID:	JC94441-8A	**Date Sampled:**	09/05/19
Matrix:	SO - Soil	**Date Received:**	09/05/19
		Percent Solids:	96.0
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 2.1 UJ-	2.1	mg/kg	1	09/06/19	09/06/19	EAL	SW846 6010D [1]	SW846 3050B [2]
Chromium	33.1	1.0	mg/kg	1	09/06/19	09/06/19	EAL	SW846 6010D [1]	SW846 3050B [2]
Nickel	14.7	4.1	mg/kg	1	09/06/19	09/06/19	EAL	SW846 6010D [1]	SW846 3050B [2]
Thallium	< 1.0	1.0	mg/kg	1	09/06/19	09/06/19	EAL	SW846 6010D [1]	SW846 3050B [2]
Vanadium	27.4	5.2	mg/kg	1	09/06/19	09/06/19	EAL	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA47408
(2) Prep QC Batch: MP17170

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A35(6.0-6.5)		
Lab Sample ID:	JC94441-8A	**Date Sampled:**	09/05/19
Matrix:	SO - Soil	**Date Received:**	09/05/19
		Percent Solids:	96.0
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	30.9	1.4	mg/kg	1	09/06/19 20:08	EAL	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A35(8.0-8.5)		
Lab Sample ID:	JC94441-9A	**Date Sampled:**	09/05/19
Matrix:	SO - Soil	**Date Received:**	09/05/19
		Percent Solids:	94.3
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 2.2 UJ-	2.2	mg/kg	1	09/06/19	09/06/19	EAL	SW846 6010D [1]	SW846 3050B [2]
Chromium	17.6	1.1	mg/kg	1	09/06/19	09/06/19	EAL	SW846 6010D [1]	SW846 3050B [2]
Nickel	15.4	4.5	mg/kg	1	09/06/19	09/06/19	EAL	SW846 6010D [1]	SW846 3050B [2]
Thallium	< 1.1	1.1	mg/kg	1	09/06/19	09/06/19	EAL	SW846 6010D [1]	SW846 3050B [2]
Vanadium	21.7	5.6	mg/kg	1	09/06/19	09/06/19	EAL	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA47408
(2) Prep QC Batch: MP17170

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A35(8.0-8.5)		
Lab Sample ID:	JC94441-9A	**Date Sampled:**	09/05/19
Matrix:	SO - Soil	**Date Received:**	09/05/19
		Percent Solids:	94.3
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	17.0	1.5	mg/kg	1	09/06/19 20:13	EAL	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A35(10.0-10.5)		
Lab Sample ID:	JC94441-10A	**Date Sampled:**	09/05/19
Matrix:	SO - Soil	**Date Received:**	09/05/19
		Percent Solids:	93.2
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 2.2 UJ-	2.2	mg/kg	1	09/06/19	09/06/19	EAL	SW846 6010D [1]	SW846 3050B [2]
Chromium	53.5	1.1	mg/kg	1	09/06/19	09/06/19	EAL	SW846 6010D [1]	SW846 3050B [2]
Nickel	16.3	4.4	mg/kg	1	09/06/19	09/06/19	EAL	SW846 6010D [1]	SW846 3050B [2]
Thallium	< 1.1	1.1	mg/kg	1	09/06/19	09/06/19	EAL	SW846 6010D [1]	SW846 3050B [2]
Vanadium	28.1	5.5	mg/kg	1	09/06/19	09/06/19	EAL	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA47408
(2) Prep QC Batch: MP17170

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A35(10.0-10.5)		
Lab Sample ID:	JC94441-10A	**Date Sampled:**	09/05/19
Matrix:	SO - Soil	**Date Received:**	09/05/19
		Percent Solids:	93.2
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	51.8	1.5	mg/kg	1	09/06/19 20:18	EAL	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A36(0.0-0.5)		
Lab Sample ID:	JC94441-11A	**Date Sampled:**	09/05/19
Matrix:	SO - Soil	**Date Received:**	09/05/19
		Percent Solids:	94.3
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 2.1 UJ-	2.1	mg/kg	1	09/06/19	09/06/19	EAL	SW846 6010D [1]	SW846 3050B [3]
Chromium	45.8	1.1	mg/kg	1	09/06/19	09/06/19	EAL	SW846 6010D [1]	SW846 3050B [3]
Nickel	25.1	4.3	mg/kg	1	09/06/19	09/06/19	EAL	SW846 6010D [1]	SW846 3050B [3]
Thallium [a]	< 2.1	2.1	mg/kg	2	09/06/19	09/09/19	GT	SW846 6010D [2]	SW846 3050B [3]
Vanadium	31.1	5.4	mg/kg	1	09/06/19	09/06/19	EAL	SW846 6010D [1]	SW846 3050B [3]

(1) Instrument QC Batch: MA47408
(2) Instrument QC Batch: MA47415
(3) Prep QC Batch: MP17170

(a) Elevated detection limit due to dilution required for high interfering element.

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A36(0.0-0.5)		
Lab Sample ID:	JC94441-11A	**Date Sampled:**	09/05/19
Matrix:	SO - Soil	**Date Received:**	09/05/19
		Percent Solids:	94.3
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	43.6	1.5	mg/kg	1	09/06/19 20:23	EAL	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A36(2.0-2.5)		
Lab Sample ID:	JC94441-12A	**Date Sampled:**	09/05/19
Matrix:	SO - Soil	**Date Received:**	09/05/19
		Percent Solids:	93.3
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 2.2 UJ-	2.2	mg/kg	1	09/06/19	09/06/19	EAL	SW846 6010D [1]	SW846 3050B [2]
Chromium	44.8	1.1	mg/kg	1	09/06/19	09/06/19	EAL	SW846 6010D [1]	SW846 3050B [2]
Nickel	35.4	4.3	mg/kg	1	09/06/19	09/06/19	EAL	SW846 6010D [1]	SW846 3050B [2]
Thallium	< 1.1	1.1	mg/kg	1	09/06/19	09/06/19	EAL	SW846 6010D [1]	SW846 3050B [2]
Vanadium	95.5	5.4	mg/kg	1	09/06/19	09/06/19	EAL	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA47408
(2) Prep QC Batch: MP17170

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A36(2.0-2.5)		
Lab Sample ID:	JC94441-12A	**Date Sampled:**	09/05/19
Matrix:	SO - Soil	**Date Received:**	09/05/19
		Percent Solids:	93.3
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	43.3	1.5	mg/kg	1	09/06/19 20:28	EAL	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A36(4.0-4.5)		
Lab Sample ID:	JC94441-13A	**Date Sampled:**	09/05/19
Matrix:	SO - Soil	**Date Received:**	09/05/19
		Percent Solids:	92.3
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 2.1 UJ-	2.1	mg/kg	1	09/06/19	09/06/19	EAL	SW846 6010D [1]	SW846 3050B [2]
Chromium	170	1.1	mg/kg	1	09/06/19	09/06/19	EAL	SW846 6010D [1]	SW846 3050B [2]
Nickel	29.8	4.2	mg/kg	1	09/06/19	09/06/19	EAL	SW846 6010D [1]	SW846 3050B [2]
Thallium	< 1.1	1.1	mg/kg	1	09/06/19	09/06/19	EAL	SW846 6010D [1]	SW846 3050B [2]
Vanadium	54.9	5.3	mg/kg	1	09/06/19	09/06/19	EAL	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA47408
(2) Prep QC Batch: MP17170

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A36(4.0-4.5)		
Lab Sample ID:	JC94441-13A	**Date Sampled:**	09/05/19
Matrix:	SO - Soil	**Date Received:**	09/05/19
		Percent Solids:	92.3
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	165	1.5	mg/kg	1	09/06/19 20:34	EAL	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A36(6.0-6.5)		
Lab Sample ID:	JC94441-14A	**Date Sampled:**	09/05/19
Matrix:	SO - Soil	**Date Received:**	09/05/19
		Percent Solids:	95.7
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony [a]	< 4.1 UJ-	4.1	mg/kg	2	09/06/19	09/06/19	EAL	SW846 6010D [1]	SW846 3050B [2]
Chromium	65.9	1.0	mg/kg	1	09/06/19	09/06/19	EAL	SW846 6010D [1]	SW846 3050B [2]
Nickel	24.5	4.1	mg/kg	1	09/06/19	09/06/19	EAL	SW846 6010D [1]	SW846 3050B [2]
Thallium [a]	< 2.0	2.0	mg/kg	2	09/06/19	09/06/19	EAL	SW846 6010D [1]	SW846 3050B [2]
Vanadium	37.2	5.1	mg/kg	1	09/06/19	09/06/19	EAL	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA47408
(2) Prep QC Batch: MP17170

(a) Elevated detection limit due to dilution required for high interfering element.

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A36(6.0-6.5)		
Lab Sample ID:	JC94441-14A	**Date Sampled:**	09/05/19
Matrix:	SO - Soil	**Date Received:**	09/05/19
		Percent Solids:	95.7
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	65.6	1.4	mg/kg	1	09/06/19 20:39	EAL	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A36(8.0-8.5)		
Lab Sample ID:	JC94441-15A	**Date Sampled:**	09/05/19
Matrix:	SO - Soil	**Date Received:**	09/05/19
		Percent Solids:	86.6
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 2.4 UJ-	2.4	mg/kg	1	09/06/19	09/06/19	EAL	SW846 6010D [1]	SW846 3050B [2]
Chromium	65.1	1.2	mg/kg	1	09/06/19	09/06/19	EAL	SW846 6010D [1]	SW846 3050B [2]
Nickel	34.3	4.8	mg/kg	1	09/06/19	09/06/19	EAL	SW846 6010D [1]	SW846 3050B [2]
Thallium	< 1.2	1.2	mg/kg	1	09/06/19	09/06/19	EAL	SW846 6010D [1]	SW846 3050B [2]
Vanadium	27.8	6.0	mg/kg	1	09/06/19	09/06/19	EAL	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA47408
(2) Prep QC Batch: MP17170

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A36(8.0-8.5)		
Lab Sample ID:	JC94441-15A	**Date Sampled:**	09/05/19
Matrix:	SO - Soil	**Date Received:**	09/05/19
		Percent Solids:	86.6
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	63.3	1.7	mg/kg	1	09/06/19 20:54	EAL	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	DUP-33(20190905)		
Lab Sample ID:	JC94441-16A	**Date Sampled:**	09/05/19
Matrix:	SO - Soil	**Date Received:**	09/05/19
		Percent Solids:	82.7
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 2.5 UJ-	2.5	mg/kg	1	09/06/19	09/06/19	EAL	SW846 6010D [1]	SW846 3050B [2]
Chromium	61.4	1.3	mg/kg	1	09/06/19	09/06/19	EAL	SW846 6010D [1]	SW846 3050B [2]
Nickel	20.0	5.0	mg/kg	1	09/06/19	09/06/19	EAL	SW846 6010D [1]	SW846 3050B [2]
Thallium	< 1.3	1.3	mg/kg	1	09/06/19	09/06/19	EAL	SW846 6010D [1]	SW846 3050B [2]
Vanadium	37.2	6.3	mg/kg	1	09/06/19	09/06/19	EAL	SW846 6010D [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA47408
(2) Prep QC Batch: MP17170

RL = Reporting Limit

Report of Analysis

Client Sample ID:	DUP-33(20190905)		
Lab Sample ID:	JC94441-16A	**Date Sampled:**	09/05/19
Matrix:	SO - Soil	**Date Received:**	09/05/19
		Percent Solids:	82.7
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	57.7	1.8	mg/kg	1	09/06/19 20:59	EAL	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A36(10.0-10.5)		
Lab Sample ID:	JC94441-17A	**Date Sampled:**	09/05/19
Matrix:	SO - Soil	**Date Received:**	09/05/19
		Percent Solids:	93.7
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony [a]	< 4.4 UJ-	4.4	mg/kg	2	09/06/19	09/09/19	GT	SW846 6010D [2]	SW846 3050B [3]
Chromium	69.3	1.1	mg/kg	1	09/06/19	09/06/19	EAL	SW846 6010D [1]	SW846 3050B [3]
Nickel	27.4	4.4	mg/kg	1	09/06/19	09/06/19	EAL	SW846 6010D [1]	SW846 3050B [3]
Thallium [a]	< 2.2	2.2	mg/kg	2	09/06/19	09/09/19	GT	SW846 6010D [2]	SW846 3050B [3]
Vanadium	48.4	5.4	mg/kg	1	09/06/19	09/06/19	EAL	SW846 6010D [1]	SW846 3050B [3]

(1) Instrument QC Batch: MA47408
(2) Instrument QC Batch: MA47415
(3) Prep QC Batch: MP17170

(a) Elevated detection limit due to dilution required for high interfering element.

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A36(10.0-10.5)		
Lab Sample ID:	JC94441-17A	**Date Sampled:**	09/05/19
Matrix:	SO - Soil	**Date Received:**	09/05/19
		Percent Solids:	93.7
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	67.7	1.5	mg/kg	1	09/06/19 21:04	EAL	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A36(12.0-12.5)		
Lab Sample ID:	JC94441-18A	**Date Sampled:**	09/05/19
Matrix:	SO - Soil	**Date Received:**	09/05/19
		Percent Solids:	81.1
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 2.4 UJ-	2.4	mg/kg	1	09/06/19	09/06/19	EAL	SW846 6010D [1]	SW846 3050B [3]
Chromium	62.8	1.2	mg/kg	1	09/06/19	09/09/19	GT	SW846 6010D [2]	SW846 3050B [3]
Nickel	18.8	4.8	mg/kg	1	09/06/19	09/06/19	EAL	SW846 6010D [1]	SW846 3050B [3]
Thallium	< 1.2	1.2	mg/kg	1	09/06/19	09/06/19	EAL	SW846 6010D [1]	SW846 3050B [3]
Vanadium	28.5	6.0	mg/kg	1	09/06/19	09/06/19	EAL	SW846 6010D [1]	SW846 3050B [3]

(1) Instrument QC Batch: MA47408
(2) Instrument QC Batch: MA47415
(3) Prep QC Batch: MP17170

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A36(12.0-12.5)		
Lab Sample ID:	JC94441-18A	**Date Sampled:**	09/05/19
Matrix:	SO - Soil	**Date Received:**	09/05/19
		Percent Solids:	81.1
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivalent [a]	58.5	1.7	mg/kg	1	09/09/19 09:48	GT	SW846 6010/7196A M

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SW-A34(2.0-2.5)		
Lab Sample ID:	JC94441-4AR	**Date Sampled:**	09/05/19
Matrix:	SO - Soil	**Date Received:**	09/05/19
		Percent Solids:	80.0
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	< 1.3	1.3	mg/kg	5	09/10/19	09/11/19	SN	SW846 6020B [1]	SW846 3050B [3]
Thallium	< 0.32	0.32	mg/kg	5	09/10/19	09/11/19	SN	SW846 6020B [1]	SW846 3050B [3]
Vanadium	511	13	mg/kg	50	09/10/19	09/12/19	SN	SW846 6020B [2]	SW846 3050B [3]

(1) Instrument QC Batch: MA47431
(2) Instrument QC Batch: MA47439
(3) Prep QC Batch: MP17229

RL = Reporting Limit

11 December, 2012

Dresdner-Robin Environmental Management
Att: Mr. Douglas Neumann, Director
371 Warren Street
Jersey City, New Jersey 07302

Re: CONRAIL - PPG Site , Laboratory Case No. E12-06877

Dear Mr. Neumann,

This cover letter, and the attached documents, detail the data validation findings associated with the following sample analytical results contained in the above-referenced deliverables set:

Site Name: CONRAIL - PPG Site

Fractions Hexavalent chromium (Cr^{+6}) Total Metals (Sb & V only) pH / Eh ; ORP	Laboratory:	Integrated Analytical Laboratories, LLC
Report No.: E12-06877	Matrix:	Non-Aqueous

Reviewer: Chris Taylor

Prepared By: Environmental Quality Associates, Inc.

SECTION A
Sample Information

The above-noted laboratory Job Number samples were analyzed by Integrated Analytical Laboratories, LLC (IAL), NJ Laboratory ID Cert. No. 14751. Hexavalent chromium (Cr^{+6}) samples were prepared and analyzed using USEPA SW-846 methods 3060A and 7196A. Total metals samples were prepared and analyzed using USEPA SW-846 methods 3050B (3010A for aqueous samples) and 6020B. Oxidation / Reduction Potential (ORP) characteristics were determined by measurement of pH / Eh values for samples and subsequent extrapolation against the $HCrO_4$- / $Cr(OH)_3$ phase diagram; pH and Eh values were measured by Standard Methods 4500H-B and 2580B, respectively.

A summary table of samples analyzed is presented below. Please note that the number of 'Total Samples' listed below is exclusive of associated QC samples (MS / MD).

Sample ID	Lab ID	Matrix	Date Collected	Analysis Hex. Cr	Analysis Metals
108_M016W _1_1-1.5	06877-001	S	07/10/12	X	X
108_M016W _1_1.5-2.0	06877-002	S	07/10/12	X	X
108_M016W _1_2.0-2.5	06877-003	S	07/10/12	X	X
108_M016 _1_1.0-1.5	06877-008	S	07/10/12	X	X
108_M016 _1_1.5-2.0	06877-009	S	07/10/12	X	X
108_M016 _1_2.0-2.5	06877-010	S	07/10/12	X	X
108_M018W2 _1_1.0-1.5	06877-015	S	07/10/12	X	X
108_M018W2 _1_1.5-2.0	06877-016	S	07/10/12	X	X
108_M018W2 _1_2.0-2.5	06877-017	S	07/10/12	X	X
108_M018W2 _1_3.0-3.5	06877-018	S	07/10/12	X	
108_M018W2 _1_4.0-4.5	06877-019	S	07/10/12	X	
REP071012-1	06877-022	S	07/10/12	X	X
108_M018N _1_1.0-1.5	06877-023	S	07/10/12	X	X
108_M018N _1_1.5-2.0	06877-024	S	07/10/12	X	X
108_M018N _1_2.0-2.5	06877-025	S	07/10/12	X	X
108_M018N _1_3.0-3.5	06877-026	S	07/10/12	X	X
108_M018N _1_3.5-4.0	06877-027	S	07/10/12	X	X
107_M022 _1_1.0-1.5	06877-030	S	07/10/12	X	
107_M022 _1_2.0-2.5	06877-031	S	07/10/12	X	
107_M022 _1_3.0-3.5	06877-032	S	07/10/12	X	
107_M022 _1_4.0-4.5	06877-033	S	07/10/12	X	
107_M024 _1_0.5-1.0	06877-036	S	07/10/12	X	
107_M024 _1_1.0-1.5	06877-037	S	07/10/12	X	
107_M024 _1_2.0-2.5	06877-038	S	07/10/12	X	
107_M024 _1_3.0-3.5	06877-039	S	07/10/12	X	
107_M024 _1_4.0-4.5	06877-040	S	07/10/12	X	
107_M018E2 _N_1.0-1.5	06877-044	S	07/10/12	X	X
107_M018E2 _N_1.5-2.0	06877-045	S	07/10/12	X	X
107_M018E2 _N_2.0-2.5	06877-046	S	07/10/12	X	X
107_M018E2 _N_3.0-3.5	06877-047	S	07/10/12	X	X
107_M018E2 _N_3.5-4.0	06877-048	S	07/10/12	X	X
107_M018E2 _N_5.5-6.0	06877-049	S	07/10/12	X	X
107_M020N _1_1.0-1.5	06877-050	S	07/10/12	X	X
107_M020N _1_2.0-2.5	06877-051	S	07/10/12	X	X
107_M020N _1_3.0-3.5	06877-052	S	07/10/12	X	X
107_M020N _1_4.0-4.5	06877-053	S	07/10/12	X	X
107_M020N _1_5.0-5.5	06877-054	S	07/10/12	X	X
107_M022N _1_1.0-1.5	06877-057	S	07/10/12	X	
107_M022N _1_2.0-2.5	06877-058	S	07/10/12	X	
107_M022N _1_3.0-3.5	06877-059	S	07/10/12	X	
107_M022N _1_4.0-4.5	06877-060	S	07/10/12	X	
_1_1.0-1.5 _1_1.0-1.5	06877-065	S	07/10/12	X	
_1_2.0-2.5 _1_2.0-2.5	06877-066	S	07/10/12	X	
_1_3.0-3.5 _1_3.0-3.5	06877-067	S	07/10/12	X	
_1_4.0-4.5 _1_4.0-4.5	06877-068	S	07/10/12	X	
REP07 102	06877-071	S	07/10/12	X	
FB071012	06877-072	A	07/10/12	X	X

S = Non-Aqueous Matrix
A = Aqueous Matrix

Total Samples = 47 (Cr+6) ; 26 (V) ; 3 (Sb)
Bold Type indicates sample taken as a Batch QC sample
Italic type indicates samples are collocated field duplicates

All samples were received one day from collection. Samples were received on ice at recorded temperature of 4°C. No sample condition issues were noted in the sample receipt log.

SECTION B
Hexavalent Chromium

Holding times from sample collection to analysis (≤24 hours for aqueous matrix; ≤30 days for non-aqueous matrix) were met for all samples.

All calibration criteria were met for this sample group, including: initial calibration linearity and continuing calibration frequency and accuracy. Method and calibration blanks for soils were free of contamination. Reported matrix spike recoveries, duplicate precision values, reported % moisture (% solids) and reported Cr^{+6} results were randomly verified from the raw data with no disparities between reported and calculated results found. Several samples were analyzed at dilution volumes due to Cr^{+6} concentrations above calibrated range; reported RL values were adjusted accordingly for these dilution runs and are noted on the sample result forms.

The soluble spike recoveries of Cr^{+6} in batch QC sample E12-06877-068 were below the lower limit of 75%, on initial and re-analysis. Since insoluble recoveries were >50%, the reported results for associated samples (-068, -071) were qualified as estimated 'J' for Cr^{+6}. The parent sample was subsequently analyzed for ORP, sulfide ($S^{=}$), TOC and ferrous iron (Fe^{++}). TOC result was positive (22400 mg/Kg), $S^{=}$ was non-detect and Fe^{++} was below RL value. Based on these ancillary results, it is indicated that the soil matrix is of a reductive nature that would not support the presence of hexavalent chromium.

SECTION C
Total Metals (V, Sb)

Holding times from sample collection to analysis were met for all total metals samples.

Calibration and QC criteria were met for this sample group, including: initial calibration linearity, continuing calibration frequency and accuracy, blanks, interference checks, matrix spike recoveries, duplicate precision, LCS recoveries and serial dilution sample precision. Reported % moisture (% solids) and reported metal results were randomly verified from the raw data with no disparities between reported and calculated results found.

No positive element results were reported for the field blank sample (FB071012).

SECTION D
ReDox Characteristics

Reported pH and eH (ORP) values and resulting ReDox (reducing or oxidizing) characteristics were randomly verified from the $HCrO_4$- / $Cr(OH)_3$ phase diagram; no disparities relative to reported values and characteristics were found.

SECTION E
COLLOCATED SAMPLES

The identity of the sample collocated with sample REP071012-4 was not found in the summary table.

SECTION F
Overall Recommendations

The results of the review and validation process for the above analytical fractions and associated samples are summarized on the attached standard-format NJDEP Data Validation Report Forms, in order to facilitate the end-user's' review of these data.

Very truly yours,
Environmental Quality Associates, Inc.

Chris W. Taylor
Vice President

03 January, 2013

Dresdner-Robin Environmental Management
Att: Mr. Douglas Neumann, Director
371 Warren Street
Jersey City, New Jersey 07302

Re: CONRAIL - PPG Site , Laboratory Case No. E12-11760

Dear Mr. Neumann,

This cover letter, and the attached documents, detail the data validation findings associated with the following sample analytical results contained in the above-referenced deliverables set:

Site Name: CONRAIL - PPG Site

Fractions		
Hexavalent chromium (Cr^{+6})	Laboratory:	Integrated Analytical Laboratories, LLC
pH / Eh ; ORP		
Report No.: E12-11760	Matrix:	Non-Aqueous

Reviewer: Chris Taylor

Prepared By: Environmental Quality Associates, Inc.

SECTION A
Sample Information

The above-noted laboratory Job Number samples were analyzed by Integrated Analytical Laboratories, LLC (IAL), NJ Laboratory ID Cert. No. 14751. Hexavalent chromium (Cr^{+6}) samples were prepared and analyzed using USEPA SW-846 methods 3060A and 7196A. Oxidation / Reduction Potential (ORP) characteristics were determined by measurement of pH / Eh values for samples and subsequent extrapolation against the $HCrO_4$- / $Cr(OH)_3$ phase diagram; pH and Eh values were measured by Standard Methods 4500H-B and 2580B, respectively.

A summary table of samples analyzed is presented below. Please note that the number of 'Total Samples' listed below is exclusive of associated QC samples (MS / MD).

Sample ID	Lab ID	Matrix	Date Collected	Hex. Cr
108_M018W 2_2-2.0-2.5	11760-001	S	11/29/12	X
108_M018W 2_2-3.0-3.5	11760-002	S	11/29/12	X
108_M018W 2_2-4.0-4.5	*11760-003*	S	11/29/12	X
108_M018W 2_2-5.0-5.5	11760-004	S	11/29/12	X
108_M018W 2_3-2.0-2.5	**11760-005**	S	11/29/12	X
108_M018N_2-1.5-2.0	*11760-009*	S	11/29/12	X
108_M018N_2-2.0-2.5	11760-010	S	11/29/12	X
108_M018N_2-3.0-3.5	11760-011	S	11/29/12	X
108_M018N_2-4.0-4.5	11760-012	S	11/29/12	X
107_M018E2_N_1-1.0-1.5	11760-014	S	11/29/12	X
107_M029E2_N-1.0-1.5	11760-019	S	11/29/12	X
107_M020E2_N-1.5-2.0	11760-020	S	11/29/12	X
107_M020E2_N-2.5-3.0	11760-021	S	11/29/12	X
107_M020E2_N-3.0-3.5	11760-022	S	11/29/12	X
107_M026E2_N-0.5-1.0	**11760-025**	S	11/29/12	X
107_M026E2_N-1.5-2.0	11760-026	S	11/29/12	X
107_M026E2_N-2.5-3.0	11760-027	S	11/29/12	X
107_M026E2_N-3.5-4.0	11760-028	S	11/29/12	X
107_M026E2_N-4.5-5.0	11760-029	S	11/29/12	X
107_M026E2_N-5.5-6.0	11760-030	S	11/29/12	X
107_M026W2_N-1.5-2.0	11760-032	S	11/29/12	X
107_M026W2_N-2.0-2.5	11760-033	S	11/29/12	X
107_M026W2_N-2.5-3.0	11760-034	S	11/29/12	X
REP-112912-1	*11760-036*	S	11/29/12	X
REP-112912-2	*11760-037*	S	11/29/12	X
FB-112912	11760-038	A	11/29/12	X

S = Non-Aqueous Matrix
A = Aqueous Matrix

Total Samples = 26
Bold Type indicates sample taken as a Batch QC sample
Italic type indicates samples are collocated field duplicates

All samples were received one day from collection. Samples were received on ice at recorded temperature of -4°C. No sample condition issues were noted in the sample receipt log ; no QA action was necessary.

SECTION C
Hexavalent Chromium

Holding times from sample collection to analysis (≤24 hours for aqueous matrix; ≤30 days for non-aqueous matrix) were met for all samples.

All calibration criteria were met for this sample group, including: initial calibration linearity and continuing calibration frequency and accuracy. Method and calibration blanks for soils were free of contamination. Reported matrix spike recoveries, laboratory duplicate precision values, reported % moisture (% solids) and reported Cr^{+6} results were randomly verified from the raw data with no disparities between reported and calculated results found. When samples were analyzed at dilution volumes due to Cr^{+6} concentrations above calibrated range, reported RL values were adjusted accordingly for these dilution runs and are noted on the sample result forms.

No data validation qualifiers were necessary for the reported hexavalent chromium results.

SECTION D
Total Metals

No samples in this SDG were requested for total metals analysis.

SECTION E
pH / Eh (ORP) / Ferrous Iron / Sulfide

Reported pH and eH (ORP) values and resulting ReDox (reducing or oxidizing) characteristics were randomly verified from the $HCrO_4$- / $Cr(OH)_3$ phase diagram; no disparities relative to reported values and characteristics were found. These values are only used for data assessment purposes when Cr^{+6} sample matrix spike recoveries are outside acceptable recovery ranges.

SECTION F
COLLOCATED SAMPLES

REP112912-1 was identified as being collocated with 108_M018N_2_1.5-2.0, and REP112912-2 was identified as being collocated with 108_M018W2_2_4.0-4.5. Precision results are tabulated below. Note: ND = Not Detected ; nc = not calculated ; * = absolute difference is shown if either sample <5x RL

	REP112912-1	M018N_2_1.5-2.0	%RPD *
Cr (VI)	0.489	3.48	2.99 *
	REP112912-2	M018W2_2_4.0-4.5	
Cr (VI)	0.998	5.82	4.82 *

The NJDEP DV guidance protocols do not provide qualification thresholds for field duplicate precision values; however, EPA Region II data validation guidance (SOP No. HW-2, Rev. 13, Sept. 2006) provides for a qualification range of >35%, <120% RPD for soils >5x RL values, and difference >2x RL if either sample is <5x CRQL. It is noted that the precision values (based on absolute concentration difference) for the identified collocated sample pairs exceed this criterion, signifying sample matrix non-homogeneity and potential impact on sample representativeness. No data qualifiers were applied by the reviewer; however the data user should incorporate this information in assessing overall data usability.

SECTION G
Overall Recommendations

The results of the review and validation process for the above analytical fractions and associated samples are summarized on the attached standard-format NJDEP Data Validation Report Forms, in order to facilitate the end-user's' review of these data.

Very truly yours,
Environmental Quality Associates, Inc.

Chris W. Taylor
Vice President

AECOM
250 Apollo Drive
Chelmsford, MA 01824

978.905.2100 tel
978.905.2101 fax

Data Validation Report

Project:	PPG-Conrail Row Investigation	
Laboratory:	SGS/North America Inc, Dayton, NJ	
Laboratory Job No.:	JD51581	
Analysis/Method:	Hexavalent Chromium SW846 3060A/7199	
Validation Level:	Full (Hexavalent Chromium)	
Site Location/Address:	70 Carteret Avenue, Jersey City, New Jersey	
AECOM Project No:	60634712 INV	
Prepared by:	Charlene Flint /AECOM	Completed on: 10/06/2022
Reviewed by:	Danielle Woitas /AECOM	File Name: JD51581_2022_10_6 DVR-F.docx

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 September 11, 2022 as part of the PPG-Conrail Row Investigation at 70 Carteret Avenue, Jersey City, New Jersey. Only the samples and parameters listed below were validated.

Field ID	Laboratory ID	Matrix	Fraction
CONRAIL-TP-2-1.5-2.0	JD51581-1	Soil	Hexavalent Chromium
CONRAIL-TP-2-1.5-2.0X (Field duplicate of CONRAIL-TP-2-1.6-2.0)	JD51581-2	Soil	Hexavalent Chromium
CONRAIL-TP-2-3.5-4.0	JD51581-3	Soil	Hexavalent Chromium
CONRAIL-TP-2-S-SW-C	JD51581-4	Soil	Hexavalent Chromium
CONRAIL-TP-2-N-SW-C	JD51581-5	Soil	Hexavalent Chromium
CONRAIL-TP-9-2.8-3.3	JD51581-6	Soil	Hexavalent Chromium
CONRAIL-TP-6-3.0-3.5	JD51581-7	Soil	Hexavalent Chromium
CONRAIL-TP-4-1.1-1.6	JD51581-8	Soil	Hexavalent Chromium
CONRAIL-TP-4-3.2-3.7	JD51581-9	Soil	Hexavalent Chromium
CONRAIL-TP-3-1.1-1.6	JD51581-10	Soil	Hexavalent Chromium
CONRAIL-TP-3-3.0-3.5	JD51581-11	Soil	Hexavalent Chromium
CONRAIL-TP-3-S-SW-C	JD51581-12	Soil	Hexavalent Chromium
CONRAIL-TP-3-N-SW-C	JD51581-13	Soil	Hexavalent Chromium
FB-20220911[Field blank]	JD51581-14	Aqueous	Hexavalent Chromium

The samples were collected following the procedures detailed in the Work Order for PPG-Conrail Row Investigation 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. 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

Matrix Spike Results

Sample CONRAIL-TP-2-3.5-4.0 (JD51581-3) was selected for the soil matrix spike analysis and used for supporting data quality recommendations.

The soluble and insoluble matrix spike (MS) recoveries for CONRAIL-TP-2-3.5-4.0 (JD51581-3) were 83.6% and 98.2%, respectively, which met the quality control (QC) criteria of 75-125%R. The post digestion spike (PDS) recovery was 106.8%, which met the PDS criteria of 85-115%. No qualifications were required.

Laboratory Duplicate Precision

Sample CONRAIL-TP-2-3.5-4.0 (JD51581-3) was selected by the laboratory to demonstrate laboratory precision capabilities.

The laboratory duplicate relative percent difference (RPD) was 42.3% and the absolute difference was greater than the reporting limit (RL). These results exceeded the RPD criterion ($\leq$ 20%) and the absolute difference criteria of less than the RL; therefore, the hexavalent chromium soil results 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.

Sample results qualified due to poor laboratory duplicate precision 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-Conrail Row Investigation
Sampling Date September 11, 2022
Lab Name/ID SGS/North America Inc, Dayton, NJ
SDG No JD51581
Sample Matrix Soil
Trip Blank ID NA
Field Blank ID FB-20220911

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
CONRAIL-TP-2-1.5-2.0	JD51581-1	CHROMIUM (HEXAVALENT)	U	5.7	5.7 J	0.48	Qualify	1
CONRAIL-TP-2-1.5-2.0X	JD51581-2	CHROMIUM (HEXAVALENT)	U	4.7	4.7 J	0.46	Qualify	1
CONRAIL-TP-2-3.5-4.0	JD51581-3	CHROMIUM (HEXAVALENT)	U	2.8	2.8 J	0.44	Qualify	1
CONRAIL-TP-2-S-SW-C	JD51581-4	CHROMIUM (HEXAVALENT)	U	9.5	9.5 J	0.47	Qualify	1
CONRAIL-TP-2-N-SW-C	JD51581-5	CHROMIUM (HEXAVALENT)	U	5.1	5.1 J	0.49	Qualify	1
CONRAIL-TP-9-2.8-3.3	JD51581-6	CHROMIUM (HEXAVALENT)	U	23.7	23.7 J	0.55	Qualify	1
CONRAIL-TP-6-3.0-3.5	JD51581-7	CHROMIUM (HEXAVALENT)	U	13.0	13.0 J	0.48	Qualify	1
CONRAIL-TP-4-1.1-1.6	JD51581-8	CHROMIUM (HEXAVALENT)	U	3.3	3.3 J	0.48	Qualify	1
CONRAIL-TP-4-3.2-3.7	JD51581-9	CHROMIUM (HEXAVALENT)	U	9.2	9.2 J	0.48	Qualify	1
CONRAIL-TP-3-1.1-1.6	JD51581-10	CHROMIUM (HEXAVALENT)	U	9.4	9.4 J	0.48	Qualify	1
CONRAIL-TP-3-3.0-3.5	JD51581-11	CHROMIUM (HEXAVALENT)	U	23.3	23.3 J	0.49	Qualify	1
CONRAIL-TP-3-S-SW-C	JD51581-12	CHROMIUM (HEXAVALENT)	U	11.7	11.7 J	0.47	Qualify	1
CONRAIL-TP-3-N-SW-C	JD51581-13	CHROMIUM (HEXAVALENT)	U	10.6	10.6 J	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 result was estimated due to laboratory duplicate imprecision.

Attachment B

Data Validation Report Form

Client Name: PPG Industries	**Project Number:** 60634712 INV
Site Location: PPG-Conrail Row Investigation, Jersey City, NJ	**Project Manager:** Laura Kinsey
Laboratory: SGS/North America Inc, Dayton, NJ	**Type of Validation:** Full
Laboratory Job No: JD51581	**Date Checked**: 10/6/2022
Validator: Charlene Flint	**Peer:** Danielle Woitas

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 2-6ºC?	X			2.4ºC.
Signed COCs included?	X			
Date of sample collection included?	X			9/11/2022
Date of sample digestion included?	X			9/13/2022
Holding time to digestion met criteria?	X			
Date of analysis included?	X			9/14/2022
Holding time to analysis met criteria?	X			
Method reference included?	X			EPA SW-846 Method 7199
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			MBs ND, FB-2022911 (JD51581-14), ND
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			CONRAIL-TP-2-3.5-4.0 (JD51581-3)
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			Spiked at 44.5 mg/kg
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			Spiked at 1010 mg/kg.
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	X			
Post Spike	X			
1) Post Spike %R criteria met? (85-115%R).	X			106.8%
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			CONRAIL-TP-2-3.5-4.0 (JD51581-3)
1) RPD criteria met? (RPD $\leq$ 20%) if both results are ≥4x RL or absolute difference ±RL if either or both results are <4xRL		X		see 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			GP42260/GN33323
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			CONRAIL-TP-2-1.5-2.0 (JD51581-1) & CONRAIL-TP-2-1.5-2.0X (JD51581-2)
1) Were Field duplicate RPD criteria met?	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		No dilutions reported

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 aqueous or 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			
Total vs Dissolved and Cr vs Cr6 Fraction Agreement Reviewed			X	
Total hexavalent chromium result and corresponding dissolved hexavalent chromium result met QC criteria?			X	
Chromium result and corresponding hexavalent chromium result met QC criteria?			X	

Matrix Spikes

Sample ID	Lab ID	Analyte	Matrix Spike	% Recovery	Lower Limit	Upper Limit	PDS	PDS Limits	Actions/Associated Samples
CONRAIL-TP-2-3.5-4.0	JD51581-3	CHROMIUM (HEXAVALENT)	Soluble	83.6	75	125	106.8	85-115	OK, Accept, associated with all samples
			Insoluble	98.2	75	125			

Lab Duplicates

Sample ID	Lab ID	Analyte	Sample Result	Duplicate Result	QL	Units	RPD	Abs Diff %	Actions/Associated Samples
CONRAIL-TP-2-3.5-4.0	JD51581-3	CHROMIUM (HEXAVALENT)	2.8	4.3	0.44	mg/kg	42.3	1.5	RPD>20%, ABS Diff >RL, **Estimate (J),** all samples

Field Duplicates

CONRAIL-TP-2-1.5-2.0 (JD51581-1)/ CONRAIL-TP-2-1.5-2.0X(JD51581-2)

Analyte	Sample Result mg/kg	QL	FD mg/kg	QL	RPD	Abs Diff	RPD Limit	Actions/Associated Samples
CHROMIUM (HEXAVALENT)	5.7	0.48	4.7	0.46	19.2	1.0	20	OK, Accept, associated with all samples

7199 Replicate Injection RPD

Sample ID	Lab ID	Rep 1 (ppm)	Rep 2 (ppm)	RPD%	RPD Criteria ≤20
CONRAIL-TP-2-1.5-2.0	JD51581-1	0.599	0.609	1.7%	OK
CONRAIL-TP-2-1.5-2.0X (Field duplicate of CONRAIL-TP-2-1.6-2.0)	JD51581-2	0.51	0.513	0.6%	OK
CONRAIL-TP-2-3.5-4.0	JD51581-3	0.311	0.285	8.7%	OK
CONRAIL-TP-2-S-SW-C	JD51581-4	1.034	1.038	0.4%	OK
CONRAIL-TP-2-N-SW-C	JD51581-5	0.523	0.52	0.6%	OK
CONRAIL-TP-9-2.8-3.3	JD51581-6	2.225	2.231	0.3%	OK
CONRAIL-TP-6-3.0-3.5	JD51581-7	1.376	1.38	0.3%	OK

Sample ID	Lab ID	Rep 1 (ppm)	Rep 2 (ppm)	RPD%	RPD Criteria ≤20
CONRAIL-TP-4-1.1-1.6	JD51581-8	0.342	0.331	3.3%	OK
CONRAIL-TP-4-3.2-3.7	JD51581-9	0.968	0.976	0.8%	OK
CONRAIL-TP-3-1.1-1.6	JD51581-10	1.001	0.999	0.2%	OK
CONRAIL-TP-3-3.0-3.5	JD51581-11	2.432	2.439	0.3%	OK
CONRAIL-TP-3-S-SW-C	JD51581-12	1.276	1.279	0.2%	OK
CONRAIL-TP-3-N-SW-C	JD51581-13	1.169	1.163	0.5%	OK

SDG: JD51581/ Method 7199 **Batch GN33323**	x - concentration	y - response (area) mAU*min	
Cr+6 ICAL 9/14/22	0.00	0.0000	STDA
Soil	0.005	0.0135	STDB
(p. 83-90 of data package)	0.05	0.2351	STDC
	0.1	0.4995	STDD
	0.5	2.5798	STDE

				(p. 83-90 of data package)
AECOM Calculated Offset	-0.0188	OK	Reported Offset	-0.0188
AECOM Slope	5.1957	OK	Reported Slope	5.1957
AECOM Calculated r	1.0000	OK	Reported r	1.0000

LCS calculation	**GP42260-B1**	**P. 36, 97**		
Highest replicate response (AREA, mAU*min)	1.294			
Instrument Concentration (ug/L)	0.253			
Sample weight (mg)	0.0025			
Percent solids	1			
Dilution Factor	4			
AECOM Calculated LCS Result (mg/Kg)	40.4	OK	Reported Result (mg/Kg)	40.4

%R = Found/True*100	**GP42260-B1**	**P. 36, 97**		
True Value (mg/kg)	40			
AECOM Calculated %R	101.1	OK	Reported %R	101.0

MS calculation	**GP42260-S2**	**P. 38, 44, 74,105**	**JD51581-3**	
Highest replicate response (mAU*min)	1.432			
Instrument Concentration (ug/L)	0.2792			
Sample weight (mg)	0.00255			
Percent solids	0.885			
Dilution Factor	80			
AECOM Calculated MS Result (mg/Kg)	989.9	OK	Reported Result (mg/Kg)	990

%R = Found/True*100	**GP42260-S2**	**P. 38, 44, 74,105**	**JD51581-3**	
True Value (mg/kg)	1010			
Native concentration (mg/Kg)	2.8			
%R	97.7	OK, rounding	Reported %R	98.2

Percent Solids	**JD51581-3**	**p. 44**	**CONRAIL-TP-2-3.5-4.0**	
Empty dish weight (g)=	25.5			
Wet weight (g)=	31.23			
Dry weight (g)=	30.57			
AECOM %solids =	88.5	OK	Reported %solids=	88.5

Reporting limit	**JD51581-3**	**P.13, 44, 74, 99**	**CONRAIL-TP-2-3.5-4.0**	
Low Standard	0.01			
Initial weight (mg)	0.00254			
Final volume (L)	0.1			
Percent solids	0.885			
Dilution Factor	1			
Reporting Limit	0.44	OK	Reported RL (mg/Kg)	0.44

Sample Calculations	**JD51581-3**	**P.13, 44, 74, 99**	**CONRAIL-TP-2-3.5-4.0**	
Background reading from highest response	0.00001			
Instrument Response highest response	0.311			
Total response for replicate 1	0.31099			
Instrument Response (mg/L)	0.063			
Sample weight (mg)	0.00254			
Final Volume (L)	0.1			
Percent solids	0.885			
Dilution Factor	1			
AECOM Calculated Result (mg/Kg)	2.82	OK,	Reported Result (mg/Kg)	2.80

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Data Validation Report

Project:	PPG-Conrail Row Investigation	
Laboratory:	SGS/North America Inc, Dayton, NJ	
Laboratory Job No.:	JD52479	
Analysis/Method:	Hexavalent Chromium SW846 3060A/7199	
Validation Level:	Full (Hexavalent Chromium)	
Site Location/Address:	70 Carteret Avenue, Jersey City, New Jersey	
AECOM Project No:	60634712 INV	
Prepared by:	Charlene Flint /AECOM	Completed on: 10/18/2022
Reviewed by:	Danielle Woitas /AECOM	File Name: JD52479_2022_10_18 DVR-F.docx

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 September 24, 2022 as part of the PPG-Conrail Row Investigation at 70 Carteret Avenue, Jersey City, New Jersey. Only the samples and parameters listed below were validated.

Field ID	Laboratory ID	Matrix	Fraction
CONRAIL-TP-1-3.6-4.1	JD52479-1	Soil	Hexavalent Chromium
CONRAIL-TP-1-SW-N-C	JD52479-3	Soil	Hexavalent Chromium
CONRAIL-TP-5-2.8-3.3	JD52479-5	Soil	Hexavalent Chromium
CONRAIL-TP-7-2.8-3.3	JD52479-7	Soil	Hexavalent Chromium
CONRAIL-TP-8-2.3-2.8	JD52479-9	Soil	Hexavalent Chromium
CONRAIL-TP-10-1.9-2.4	JD52479-11	Soil	Hexavalent Chromium
CONRAIL-TP-10-1.9-2.4-X (Field duplicate of CONRAIL-TP-10-1.9-2.4)	JD52479-12	Soil	Hexavalent Chromium
FB-20220924 [Field blank]	JD52479-13	Aqueous	Hexavalent Chromium

The samples were collected following the procedures detailed in the Work Order for PPG-Conrail Row Investigation 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. 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

Matrix Spike Results

Sample CONRAIL-TP-10-1.9-2.4 (JD52479-11) was selected for the soil matrix spike analysis and used for supporting data quality recommendations.

The soluble and insoluble matrix spike (MS) recoveries for CONRAIL-TP-10-1.9-2.4 (JD52479-11) were 92.0% and 97.5%, respectively, which met the quality control (QC) criteria of 75-125%R. The post digestion spike (PDS) recovery was 97.7%, which met the PDS criteria of 85-115%. No qualifications were required.

Laboratory Duplicate Precision

Sample CONRAIL-TP-10-1.9-2.4 (JD52479-11) was selected by the laboratory to demonstrate laboratory precision capabilities.

The laboratory duplicate relative percent difference (RPD) was 69.4%, and the absolute difference was greater than the reporting limit (RL). These results exceeded the RPD criterion (≤ 20%) and the absolute difference criteria of less than the RL; therefore, the hexavalent chromium soil results were qualified as estimated (J).

The replicate injection RPD for sample CONRAIL-TP-5-2.8-3.3 (JD52479-5) was 25.0% and exceeded the RPD criterion (≤ 20%). The result for CONRAIL-TP-5-2.8-3.3 (JD52479-5) was 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 laboratory duplicate precision are usable as estimated values with an unknown directional bias.

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).

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-Conrail Row Investigation
Sampling Date September 24, 2022
Lab Name/ID SGS/North America Inc, Dayton, NJ
SDG No JD52479
Sample Matrix Soil
Trip Blank ID NA
Field Blank ID FB-20220924

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
CONRAIL-TP-1-3.6-4.1	JD52479-1	CHROMIUM (HEXAVALENT)	U	6.4	6.4J	0.45	Qualify	1
CONRAIL-TP-1-SW-N-C	JD52479-3	CHROMIUM (HEXAVALENT)	U	12.7	12.7J	0.45	Qualify	1
CONRAIL-TP-5-2.8-3.3	JD52479-5	CHROMIUM (HEXAVALENT)	U	0.45J	0.45J	0.49	Qualify	1,2,3
CONRAIL-TP-7-2.8-3.3	JD52479-7	CHROMIUM (HEXAVALENT)	U	2.3	2.3J	0.45	Qualify	1
CONRAIL-TP-8-2.3-2.8	JD52479-9	CHROMIUM (HEXAVALENT)	U	2.4	2.4J	0.44	Qualify	1
CONRAIL-TP-10-1.9-2.4	JD52479-11	CHROMIUM (HEXAVALENT)	U	9.7	9.7J	0.48	Qualify	1
CONRAIL-TP-10-1.9-2.4-X	JD52479-12	CHROMIUM (HEXAVALENT)	U	10.6	10.6J	0.48	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 result was estimated due to laboratory duplicate imprecision.
2. The reported result was greater than the MDL but less than the RL and qualified as estimated (J) by the laboratory.
3. The result was estimated due to poor dual column RPD.

Attachment B

Data Validation Report Form

Client Name: PPG Industries	**Project Number:** 60634712 INV
Site Location: PPG-Conrail Row Investigation, Jersey City, NJ	**Project Manager:** Laura Kinsey
Laboratory: SGS/North America Inc, Dayton, NJ	**Type of Validation:** Full
Laboratory Job No: JD52479	**Date Checked**: 10/18/2022
Validator: Charlene Flint	**Peer:** Danielle Woitas

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 2-6ºC?	X			2.9ºC.
Signed COCs included?	X			
Date of sample collection included?	X			9/24/2022
Date of sample digestion included?	X			9/26/2022
Holding time to digestion met criteria?	X			
Date of analysis included?	X			
Holding time to analysis met criteria?	X			9/27/2022
Method reference included?	X			EPA SW-846 Method 7199
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			MBs ND, FB-2022924 (JD52479-13) ND
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			CONRAIL-TP-10-1.9-2.4 (JD52479-11)
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			Spiked at 47.2 mg/kg
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			CONRAIL-TP-10-1.9-2.4 (JD52479-11)
1) Insoluble Matrix %R criteria met? (75-125%R).	X			
2) Was the spike concentration around 400 to 800 mg/Kg?	X			Spiked at 1060 mg/kg.
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	X			
Post Spike	X			
1) Post Spike %R criteria met? (85-115%R).	X			97.7%
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			CONRAIL-TP-10-1.9-2.4 (JD52479-11)
1) RPD criteria met? (RPD $\leq$ 20%) if both results are ≥4x RL or absolute difference ±RL if either or both results are <4xRL		X		see 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			GP42486/GN33747
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			CONRAIL-TP-10-1.9-2.4 (JD52479-11) & CONRAIL-TP-10-1.9-2.4-X (JD52479-12)
1) Were Field duplicate RPD criteria met?	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		No dilutions reported

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 aqueous or 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 below
Total vs Dissolved and Cr vs Cr6 Fraction Agreement Reviewed			X	
Total hexavalent chromium result and corresponding dissolved hexavalent chromium result met QC criteria?			X	
Chromium result and corresponding hexavalent chromium result met QC criteria?			X	

Matrix Spikes

Sample ID	Lab ID	Analyte	Matrix Spike	% Recovery	Lower Limit	Upper Limit	PDS	PDS Limits	Actions/Associated Samples
CONRAIL-TP-10-1.9-2.4	JD52479-11	CHROMIUM (HEXAVALENT)	Soluble	92.0	75	125	97.7	85-115	OK, Accept, associated with all samples
			Insoluble	97.5	75	125			

Lab Duplicates

Sample ID	Lab ID	Analyte	Sample Result	Duplicate Result	QL	Units	RPD	Abs Diff	Actions/Associated Samples
CONRAIL-TP-10-1.9-2.4	JD52479-11	CHROMIUM (HEXAVALENT)	9.7	4.7	0.48	mg/kg	69.4	5	RPD>20%, ABS Diff >RL, **Estimate (J**), all samples

Field Duplicates

CONRAIL-TP-10-1.9-2.4/ CONRAIL-TP-10-1.9-2.4-X

Analyte	Sample Result mg/kg	QL	FD mg/kg	QL	RPD	Abs Diff	RPD Limit	Actions/Associated Samples
CHROMIUM (HEXAVALENT)	9.7	0.48	10.6	0.48	8.9	0.9	20	OK, Accept, associated with all samples

7199 Replicate Injection RPD

Sample ID	Lab ID	Rep 1 (ppm)	Rep 2 (ppm)	RPD%	RPD Criteria ≤20
CONRAIL-TP-1-3.6-4.1	JD52479-1	0.659	0.713	7.9%	OK
CONRAIL-TP-1-SW-N-C	JD52479-3	1.43	1.411	1.3%	OK
CONRAIL-TP-5-2.8-3.3	JD52479-5	0.018	0.014	25.0%	RPD >20%, **Estimate (J)**
CONRAIL-TP-7-2.8-3.3	JD52479-7	0.226	0.232	2.6%	OK
CONRAIL-TP-8-2.3-2.8	JD52479-9	0.244	0.255	4.4%	OK
CONRAIL-TP-10-1.9-2.4	JD52479-11	0.986	1.001	1.5%	OK
CONRAIL-TP-10-1.9-2.4-X	JD52479-12	1.088	1.094	0.5%	OK

Sample ID	Lab ID	Rep 1 (ppm)	Rep 2 (ppm)	RPD%	RPD Criteria ≤20
(Field duplicate of CONRAIL-TP-10-1.9-2.4)					

SDG: JD52479/ Method 7199 **Batch GN33747**	x - concentration	y - response (area) mAU*min	
Cr+6 ICAL 9/27/22	0.00	0.0000	STDA
Soil	0.005	0.0164	STDB
(p. 85-91 of data package)	0.05	0.2103	STDC
	0.1	0.4796	STDD
	0.5	2.5425	STDE

				(p. 85-91 of data package)
AECOM Calculated Offset	-0.0292	OK	Reported Offset	-0.0292
AECOM Slope	5.1383	OK	Reported Slope	5.1382
AECOM Calculated r	0.9999	OK	Reported r	0.9998

LCS calculation	**GP42486-B1**	**P. 29,97**		
Highest replicate response (AREA, mAU*min)	1.232			
Instrument Concentration (ug/L)	0.245			
Sample weight (mg)	0.0025			
Percent solids	1			
Dilution Factor	4			
AECOM Calculated LCS Result (mg/Kg)	39.3	OK	Reported Result (mg/Kg)	39.3

%R = Found/True*100	**GP42486-B1**	**P. 29,97**		
True Value (mg/kg)	40			
AECOM Calculated %R	98.2	OK	Reported %R	98.3

MS calculation	**GP42486-S2**	**P. 31,37,77,105**	**JD52479-11**	
Highest replicate response (mAU*min)	1.813			
Instrument Concentration (ug/L)	0.3585			
Sample weight (mg)	0.00252			
Percent solids	0.822			
Dilution Factor	60			
AECOM Calculated MS Result (mg/Kg)	1038.5	OK, rounding	Reported Result (mg/Kg)	1040

%R = Found/True*100	**GP42486-S2**	**P. 31,37,77,105**	**JD52479-11**	
True Value (mg/kg)	1060			
Native concentration (mg/Kg)	9.7			
%R	97.1	OK, rounding	Reported %R	97.5

Percent Solids	**JD52479-11**	**p. 37**	**CONRAIL-TP-10-1.9-2.4**	
Empty dish weight (g)=	26.59			
Wet weigh (g)t=	32.83			
Dry weigh (g)t=	31.72			
AECOM %solids =	82.2	OK	Reported %solids	82.2

Reporting limit	**JD52479-11**	**P. 16,37,77,99**	**CONRAIL-TP-10-1.9-2.4**
Low Standard	0.01		
Initial weight (mg)	0.00252		
Final volume (L)	0.1		
Percent solids	0.822		
Dilution Factor	1		

Reporting Limit	0.48	OK	Reported RL (mg/Kg)	0.48

Sample Calculations	**JD52479-11**	**P. 16 ,37,77,99**	**CONRAIL-TP-10-1.9-2.4**	
Background reading from highest response	0.00001			
Instrument Response highest response	1.001			
Total response for replicate 1	1.00099			
Instrument Response (mg/L)	0.200			
Sample weight (mg)	0.00252			
Final Volume (L)	0.1			
Percent solids	0.822			
Dilution Factor	1			
AECOM Calculated Result (mg/Kg)	9.68	OK,	Reported Result (mg/Kg)	9.70

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Data Validation Report

Project:	PPG-Conrail Row Investigation	
Laboratory:	SGS/North America Inc, Dayton, NJ	
Laboratory Job No.:	JD52486	
Analysis/Method:	Hexavalent Chromium SW846 3060A/7199	
Validation Level:	Full (Hexavalent Chromium)	
Site Location/Address:	70 Carteret Avenue, Jersey City, New Jersey	
AECOM Project No:	60634712 INV	
Prepared by:	Charlene Flint /AECOM	Completed on: 10/04/2022
Reviewed by:	Danielle Woitas /AECOM	File Name: JD52486_2022_10_4 DVR-F.docx

Introduction

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- 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:

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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 September 25, 2022 as part of the PPG-Conrail Row Investigation at 70 Carteret Avenue, Jersey City, New Jersey. Only the samples and parameters listed below were validated.

Field ID	Laboratory ID	Matrix	Fraction
CONRAIL-TP-3-3.0-3.5-S	JD52486-1	Soil	Hexavalent Chromium
CONRAIL-TP-9-2.8-3.3-S	JD52486-2	Soil	Hexavalent Chromium
CONRAIL-TP-9-2.8-3.3-S-X	JD52486-3	Soil	Hexavalent Chromium
FB-20220925 [Field blank]	JD52486-5	Aqueous	Hexavalent Chromium

The samples were collected following the procedures detailed in the Work Order for PPG-Conrail Row Investigation 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. 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

Matrix Spike Results

Sample CONRAIL-TP-9-2.8-3.3-S (JD52486-2) was selected for the soil matrix spike analysis and used for supporting data quality recommendations.

The soluble and insoluble matrix spike (MS) recoveries for CONRAIL-TP-9-2.8-3.3-S (JD52486-2) were 81.3% and 100.3%, respectively, which met the quality control (QC) criteria of 75-125%R. The post digestion spike (PDS) recovery was 98.7%, which met the PDS criteria of 85-115%. No qualifications were required.

Laboratory Duplicate Precision

Sample CONRAIL-TP-9-2.8-3.3-S (JD52486-2) was selected by the laboratory to demonstrate laboratory precision capabilities.

The laboratory duplicate absolute difference was 1.12. These results exceeded the absolute difference criterion (±RL) for results <4x RL; therefore, the hexavalent chromium soil results were qualified as estimated (J).

Field Duplicate

The field duplicate pair in this SDG was CONRAIL-TP-9-2.8-3.3-S (JD52486-2) and CONRAIL-TP-9-2.8-3.3-S-X (JD52486-3). The RPD for the reported hexavalent chromium field duplicate results exceeded the QC acceptance RPD criterion (RPD ≤20%). The absolute difference between the reported field duplicate results was also greater than the absolute difference criteria of less than or equal to the RL; therefore, the reported hexavalent chromium results in all the soil samples in this SDG 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.

Sample results qualified due to poor laboratory duplicate or field duplicate precision 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-Conrail Row Investigation
Sampling Date September 25, 2022
Lab Name/ID SGS/North America Inc, Dayton, NJ
SDG No JD52486
Sample Matrix Soil
Trip Blank ID NA
Field Blank ID FB-20220925

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
CONRAIL-TP-3-3.0-3.5-S	JD52486-1	CHROMIUM (HEXAVALENT)	U	2.1	2.1J	0.47	Qualify	1,2
CONRAIL-TP-9-2.8-3.3-S	JD52486-2	CHROMIUM (HEXAVALENT)	U	0.88	0.88J	0.45	Qualify	1,2
CONRAIL-TP-9-2.8-3.3-S-X	JD52486-3	CHROMIUM (HEXAVALENT)	U	1.8	1.8J	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. The result was estimated due to laboratory duplicate imprecision.
2. Field duplicate precision criteria were not met.

Attachment B

Data Validation Report Form

Client Name: PPG Industries	**Project Number:** 60634712 INV
Site Location: PPG-Conrail Row Investigation, Jersey City, NJ	**Project Manager:** Laura Kinsey
Laboratory: SGS/North America Inc, Dayton, NJ	**Type of Validation:** Full
Laboratory Job No: JD52486	**Date Checked**: 10/4/2022
Validator: Charlene Flint	**Peer:** Danielle Woitas

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 2-6ºC?	X			2.0ºC.
Signed COCs included?	X			
Date of sample collection included?	X			9/25/2022
Date of sample digestion included?	X			9/27/2022
Holding time to digestion met criteria?	X			
Date of analysis included?	X			
Holding time to analysis met criteria?	X			
Method reference included?	X			EPA SW-846 Method 7199
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			MBs ND, FB-2022925 (JD52486-5) ND
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			CONRAIL-TP-9-2.8-3.3-S (JD52486-2)
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			Spiked at 45.9 mg/kg
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			Spiked at 754 mg/kg.
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	X			
Post Spike	X			
1) Post Spike %R criteria met? (85-115%R).	X			98.7%
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			CONRAIL-TP-9-2.8-3.3-S (JD52486-2)
1) RPD criteria met? (RPD $\leq$ 20%) if both results are ≥4x RL or absolute difference ±RL if either or both results are <4xRL		X		see 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			GN33815
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			CONRAIL-TP-9-2.8-3.3-S (JD52486-2) & CONRAIL-TP-9-2.8-3.3-S (JD52486-2)-X (JD52486-3
1) Were Field duplicate RPD criteria met?		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		No dilutions reported

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 aqueous or 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			
Total vs Dissolved and Cr vs Cr6 Fraction Agreement Reviewed			X	
Total hexavalent chromium result and corresponding dissolved hexavalent chromium result met QC criteria?			X	
Chromium result and corresponding hexavalent chromium result met QC criteria?			X	

Matrix Spikes

Sample ID	Lab ID	Analyte	Matrix Spike	% Recovery	Lower Limit	Upper Limit	PDS	PDS Limits	Actions/Associated Samples
CONRAIL-TP-9-2.8-3.3-S	JD52486-2	CHROMIUM (HEXAVALENT)	Soluble	81.3	75	125	98.7	85-115	OK, Accept, associated with all samples
			Insoluble	100.3	75	125			

Lab Duplicates

Sample ID	Lab ID	Analyte	Sample Result	Duplicate Result	QL	Units	RPD	Abs Diff	Actions/Associated Samples
CONRAIL-TP-9-2.8-3.3-S	JD52486-2	CHROMIUM (HEXAVALENT)	0.88	2.0	0.45	mg/kg	77.8	1.12	RPD>20%, ABS Diff >RL, Estimate (J), all samples

Field Duplicates

CONRAIL-TP-9-2.8-3.3-S/ CONRAIL-TP-9-2.8-3.3-S-X

Analyte	Sample Result mg/kg	QL	FD mg/kg	QL	RPD	Abs Diff	RPD Limit	Actions/Associated Samples
CHROMIUM (HEXAVALENT)	0.88	0.45	1.8	0.46	68.7	0.92	20	RPD>20%, ABS Diff >RL, Estimate (J), all samples

7199 Replicate Injection RPD

Sample ID	Lab ID	Rep 1 (ppm)	Rep 2 (ppm)	RPD%	RPD Criteria ≤20
CONRAIL-TP-3-3.0-3.5-S	JD52486-1	0.315	0.314	0.3%	OK
CONRAIL-TP-9-2.8-3.3-S	JD52486-2	0.115	0.102	12.0%	OK
CONRAIL-TP-9-2.8-3.3-S-X	JD52486-3	0.263	0.257	2.3%	OK

SDG: JD52486/ Method 7199	x - concentration	y - response (area)		
Batch GN33815		mAU*min		
Cr+6 ICAL 9/28/22	0.00	0.0000	STDA	
Soil	0.005	0.0289	STDB	
(p. 72-78 of data package)	0.05	0.3404	STDC	
	0.1	0.7201	STDD	
	0.5	3.8667	STDE	
				(p. 72-78 of data package)
AECOM Calculated Offset	-0.0381	OK	Reported Offset	-0.0381
AECOM Slope	7.7991	OK	Reported Slope	7.7991
AECOM Calculated r	0.9999	OK	Reported r	0.9999
LCS calculation	GP42493-B1	P. 21,84		
Highest replicate response (AREA, mAU*min)	1.918			
Instrument Concentration (ug/L)	0.251			
Sample weight	0.0025			
Percent solids	1			
Dilution Factor	4			
AECOM Calculated LCS Result (mg/Kg)	40.1	OK	Reported Result (mg/Kg)	40.1
%R = Found/True*100	GP42493-B1	P. 21,84		
True Value (mg/kg)	40			
AECOM Calculated %R	100.3	OK	Reported %R	100.3
MS calculation	GP42493-S1	P. 23,30,65,89	JD52486-2	
Highest replicate response (mAU*min)	1.586			
Instrument Concentration (ug/L)	0.2082			
Sample weight	0.00251			
Percent solids	0.868			
Dilution Factor	4			
AECOM Calculated MS Result (mg/Kg)	38.2	OK	Reported Result (mg/Kg)	38
%R = Found/True*100	GP42493-S1	P. 23,30,65,89	JD52486-2	
True Value (mg/kg)	45.9			
Native concentration (mg/Kg)	0.88			
%R	81.4	OK, rounding	Reported %R	81.3
Percent Solids	JD52486-2	p. 30	CONRAIL-TP-9-2.8-3.3-S	
Empty dish weight=	23.21			
Wet weight=	30.66			
Dry weight=	29.68			
AECOM %solids =	86.8	OK	Reported %solids=	86.8
Reporting limit	JD52486-2	P. 30,65	CONRAIL-TP-9-2.8-3.3-S	
Low Standard	0.01			
Initial weight (g)	0.00257			
Final volume (L)	0.1			
Percent solids	0.868			
Dilution Factor	1			
Reporting Limit	0.45	OK	Reported RL (mg/Kg)	0.45

Sample Calculations	JD52486-2	P. 30,65	CONRAIL-TP-9-2.8-3.3-S	
Background reading from highest response	0.00001			
Instrument Response highest response	0.115			
Total response for replicate 1	0.11499			
Instrument Response (mg/L)	0.020			
Sample weight (mg)	0.00257			
Final Volume (L)	0.1			
Percent solids	0.868			
Dilution Factor	1			
AECOM Calculated Result (mg/Kg)	0.88	OK,	Reported Result (mg/Kg)	0.88