# 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: <u>PPG – Site 107, Laboratory Job No. 460-22995-1</u>

#### 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		
	<u>Fractions</u> Hexavalent chromium (Cr <sup>+6</sup> ) Total Metals (Cr, Ni, Sb, Tl, V) pH / Eh ; ORP	Laboratory:	TestAmerica Laboratories, Inc.
	Report No.: <u>460-22995-1</u>	Matrix:	Non-Aqueous
Reviewer:	Chris Taylor		
Prepared By:	Environmental Quality Associates 487 Shoddy Hollow Road Middletown, New York 10940	, 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<sub>4</sub>- / Cr(OH)<sub>3</sub> 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).

Dresdner-Robin

Mr. Douglas Neumann

25 May, 2011

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

25 May, 2011

S = Non-Aqueous Matrix	Total Samples = 40
A = Aqueous Matrix	<b>Bold Type</b> 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 ( $\leq 24$  hours for aqueous matrix;  $\leq 30$  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).

#### <u>SECTION E</u> 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: <u>PPG – Sites 107 and 108, Laboratory Job No. 460-23018-1</u>

#### 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

	<u>Fractions</u> Hexavalent chromium (Cr <sup>+6</sup> ) Total Metals (Cr, Ni, Sb, Tl, V) pH / Eh ; ORP	Laboratory:	TestAmerica Laboratories, Inc.
	Report No.: <u>460-23018-1</u>	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<sub>4</sub>- / Cr(OH)<sub>3</sub> 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).

26 May, 2011

		Lab ID		Date	Ana	lysis
Site ID	Sample ID	460-23018-	Matrix	Collected	Hex Cr	Metals
107_	M022_0.0	1	S	02/11/11	Х	Х
107_	M022_1.0/2.0	2	S	02/11/11	Х	Х
107_	M022_4.0/4.5	3	S	02/11/11	Х	Х
107_	M022_4.5	4	S	02/11/11	Х	Х
107_	M022_8.5	5	S	02/11/11	Х	Х
107_	M022_12.5	6	S	02/11/11	Х	Х
	FB021111	7	Α	02/11/11	Х	Х
107_	REP021111-1	8	S	02/11/11	Х	Х
108_	REP021111-2	9	S	02/11/11	Х	Х
108_	REP021111-3	10	S	02/11/11	Х	Х
107_	M020_0.0	11	S	02/11/11	Х	Х
107_	M020_3.5	12	S	02/11/11	Х	Х
107_	M020_7.5	13	S	02/11/11	Х	Х
107_	M020_11.5	14	S	02/11/11	Х	Х
107_	M020_1.0/1.2	15	S	02/11/11	Х	Х
107_	M020_2.5	16	S	02/11/11	Х	Х
107_	M020_3.0	17	S	02/11/11	Х	Х
108_	K018_0.0	18	S	02/11/11	Х	Х
108_	K018_4.5	19	S	02/11/11	Х	Х
108_	K018_8.5	20	S	02/11/11	Х	Х
108_	K018_12.5	21	S	02/11/11	Х	Х
108_	1018_0.0	22	S	02/11/11	Х	Х
108_	1018_4.5	23	S	02/11/11	Х	Х
108_	1018_8.5	24	S	02/11/11	Х	Х
108_	l018_12.5	25	S	02/11/11	Х	Х
108_	G018_0.0	26	S	02/11/11	Х	Х
108_	G018_3.5	27	S	02/11/11	Х	Х
108_	G018_5.5	28	S	02/11/11	Х	Х
108_	G018_9.5	29	S	02/11/11	Х	Х
108_	G018_13.5	30	S	02/11/11	Х	Х

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.

#### <u>SECTION C</u> 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 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<sup>+6</sup> 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).

#### <u>SECTION E</u> 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: <u>PPG – Site 108, Laboratory Job No. 460-23155-1</u>

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.: <u>460-23155-1</u>

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<sub>4</sub>- / Cr(OH)<sub>3</sub> 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).

#### Dresdner-Robin

Mr. Douglas Neumann

02 June, 2011

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

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  $2.5^{\circ}$ C.

#### 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.

EQA, Inc.

J23155-1\_dvr\_rev 062211.doc

#### 02 June, 2011

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<sup>+6</sup> 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<sup>+6</sup> 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. <u>Exception: see QA Action above</u>.

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

EQA, Inc.

J23155-1\_dvr\_rev 062211.doc

02 June, 2011

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).

#### <u>SECTION E</u> 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<sub>4</sub>- / Cr(OH)<sub>3</sub> 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

200	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

#### 02 June, 2011

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

# DATA DELIVERABLE REQUIREMENTS

Site Name PPG SITE 108	Lab Job No. <u>460-23155-1</u>				
LocationNJ	Date of Review06/02/2011				
Laboratory NameTestAmerica Edison	Client_Dresdner-Robin Environmental				
ReviewerC. Taylor / EQA, Inc	Client ContactDouglas Neumann				

# GENERAL REQUIREMENTS: Circle YES or NO and list the deviations at the bottom: A. Permanently Bound N/A G. Methodology Review Yes No

В.	Paginated	Yes No	н.	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 Summ	a Yes No			

Describe	any	deviations	from	the	requirements
	-				

Page 1 of 21

# HOLDING TIMES FOR METALS

<b>SAMPLE LAB ID</b> 460-23155-	SAMPLE FIELD ID 108_	DATE of SAMPLE COLLECTION	ICP ANALYSIS DATE	HOLDING TIME EXCEEDE D
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\_ TEMP\_2.5<sup>o</sup>C\_\_

COOLER

PRESERVATION\_FB

PH<2\_

# SW-846 INORGANICS-3 INSTRUMENT CALIBRATION, INITIAL CALIBRATION CHECK (ICC) and INITIAL CALIBRATION VERIFICATION (ICV)

ASSO	DCIATED	SAMPLES	AII	SDG	sam	ples.
1.	Was the ICP i	instrument (6010E	3) properly stand	ardized? Yes	No N/A	
2.	Was the ICV/	ICC analyzed imn	nediately after th	e systems were cal	ibrated?	
action	lf n	no,	explain	and	Yes	No list
3.	Was the ICV/I	CC analyzed for	every analyte?		Yes	No
action	lf 1	no,	explain	and		list
4.	Do all ICV/IC0	C analytes meet the	ne QC requireme	ents for % recovery	? Yes No	
5.	Show calculat	ion for the % reco	overy of one ICV	analyte analyzed b	y ICP.	
	AnalyteSb_	ICV460-6	5462/5	Lab Value94%	/	
Raw o True o	conc.: <u>935.9</u> conc.: <u>1000</u>	ug/L ICV 02/22 ug/L	/11 17:09	Lab value:	94	%
Dogo 2	of 01	Calculated	a recovery = Hav	v conc./ I rue conc.:		70

MAY 2002

6.	SP CC	ECIFIC DMMENTS_				
COI	NTINU	ING CALIBR	ATION VERIFICATION (	CCV) and CALIBR	ATION CHECK ST	ANDARD (CCS)
SS	OCIA	TED	SAMPLES	AII	SDG	samples.
						· · ·
•	a.	Was the (	CV/CCS performed	at the minimum f	requency of 10%	%? Yes
actio	n	lf		no,		list
	b.	Was the analysis?	CCV/CCS performed	l after ten samp	les and at the e	end of sample Yes
	acti	lf on		no,		list
	We	re the CCV	/CCS standards anal	yzed for all analy	rtes?	Yes
	lf ne	o, list affect	ed analytes, their ass	ociated samples	and action.	
	-					
3.	Wa	s the CCV/	CCS concentration n	ear the midpoint	of the calibration	curve?
						Yes

MAY 2002

Do all CCV/CCS analytes meet the QC requirement for % recovery? Yes
 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.

Analy	rteV	CC	V 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 reco	very = Rav	v conc./True conc.=	93.6	]%

6. SPECIFIC COMMENTS

No

# **METHOD BLANK SUMMARY**

lf	no,	explain	and	note	action
Did the	MB460-65 frequency of the	136/1-A^2 e method blank analy	ysis meet method	l requirements?	Ves No.
	MB460-6	5126/1-A^2	Units:	mg/k	g ug/L
Method	Blank IDMB4	460-65128/1-A^2	Samp	ole matrix: Soil	Water

ANALYTE	CONCENTRATION	<mdl< th=""><th>COMMENTS / ACTION</th></mdl<>	COMMENTS / ACTION
Cr, Ni, Sb, Tl, V	U		n/a
1. 1.			

samples\_\_\_\_\_

DPFSR/BEMQA MAY 2002

Page 6 of 21

**CALIBRATION BLANKS** 

ASS sam	SOCIATED		SAMPL	ES		_All	S	DG		soil
1.	Were the ICV/ICC?	initial	calibration	blanks an	alyzed	for all	analytes	and	run afte	r the
	lf r	0,	list	affected		analyt	es,	and	a	ction.
2.	Was the a If no, list a <u>Cr and V r</u> <u>&gt;MDL, <r< u=""> <u>response,</u> <u>high bias c</u></r<></u>	bsolute ffected <u>esults L value</u> and we due to i	e value for a analytes ar <u>in CCBs bra</u> es. Cr respo ere qualified instrument b	III analytes in acketing sau anse in both as estimationark contai	in the c nem. <u>mples 4</u> <u>bracke</u> ted 'J', minatio	alibration 460-23 eted sa with inc on.	on blank b 1 <u>55-16 an</u> mples we lication of	below f <u>d 23 v</u> re <10 poten	the MDL' Yes <u>vere</u> <u>0x CCB</u> t <u>tial</u>	? No
3.	Were the co the CCV/CC	ontinuir S?	ng calibratio	n blanks ar	nalyzec	l for all	analytes a	and ru	n after Yes	No
	If no, list at	fected	analytes, a	ssociated s	amples	s and a	ction			
4.	Was the fro If no, list at	equenc	cy for the co analytes, a	ontinuing ca ssociated s	libratio amples	n blank s and a	s correct?	,	Yes	No

DPFSR/BEMQA MAY 2002

Page 7 of 21

# ICP INTERFERENCE CHECK SAMPLE

ASSOCIATED samples	SAMPLES	AII		SDG	
1. Was an ICP interfe	rence check sample per	ormed at the correct	t frequenc	cy?	
lf no, action	note	any de	viations	Yes	No and
2. Were the analytes	interest and interferents	for ICS reported?		Yes	No
If deviations	nc	),	2000 1000	-	note
3. Did all the required	analytes of interest in the	ICS meet the QC li	mit of 80-	·120%?	
				Yes	No
If no, list the ana	alytes, the % recovery, as	ssociated samples a	nd the ac	tion	
4. Show the calculation Analyte _ Ni	n for the % recovery for ICSAB ID:460-65462/	one analyte in the IC 83 Lab value _	2S. _91%		
Raw conc.: 91.0 ug	ı/L	La	b value:	91	%
Page 8 of 21			DI	PFSR/BE	AQN

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 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 lf note deviations and action no, 2. Was the MS/MSD analyses performed on a field sample? No Yes If all no, reject associated samples. Were two (2) analytical methods used to obtain reported values for one 3. a. analyte (i.e., ICP and AA)? Yes No If list analytes yes,

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

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

Page 10 of 21

DPFSR/BEMQA MAY 2002

N/A

DPFSR/BEMQA MAY 2002

Page 11 of 21

# SW-846 INORGANICS-12 MATRIX SPIKE (MS) and MATRIX SPIKE DUPLICATE (MSD)

	Part 2 of 2
4.	Did the % recovery for all analytes meet the criteria of 75-125 %?
	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?
	If no, list analytes and action
	QA Action: n/a
6.	a. Show calculation for % recovery for one analyte.
	AnalyteSb (460-23155-15 MS) Lab value87%
Spike	e Added: 56.6 (spike - sample) x 100
Spike Samp	e conc: <u>49.4</u> % rec. = spike added = <b>87.3</b> %
	b. Show calculation for % RPD for one analyte.
	AnalyteCr (460-23155-15 DU) Lab value _17% RPD
Samp	ple : _13.7  Sample - Duplicate  x 100
Duplic	cate: 16.3 % RPD = (Sample + Duplicate) / 2 = <b>17.3</b> % RPD

SW-	846 INORGANIC	S-13 POS	T-DIGESTION SP	IKE ANALYSIS	
Post	Digestion Spik	e Analysis p	erformed on samp	lePDS was not rep	orted
Sam	ple matrix:	Soil	Water	% Solids	
Unite	5:	mg/kg	ug/L		
ASS	OCIATED				SAMPLES
1.	Was post-dig	jestion spike	analysis performe	ed at the correct freque	ency? Yes No
2.	Was post-dig If no, list ana	estion spike lytes and qu	performed on a fie alify them.	eld sample?	Yes No
3.	List the analy performed bu	/te(s), and t it still did not	heir % recovery w meet the QC crite	here post-digestion sp ria and action.	oike analysis was N/A
4.	Show the cal spike analysi	culation for s was perfor	% recovery for at med.	least one analyte whe	ere post-digestion
	Analyte			Lab	value

Page 13 of 21

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

	L	ABORATORY	CONTROL S	SAMPLE (L	CS)		
Sample ma	trix: Soil	Water					
Units:	mg/kg	ug/L					
ASSOCIAT samples	ED	SAMP	LES		AII		SDG
1. Was	the laboratory	control samp no,	le performed	at the corre give	ect frequ	uency? Yes	No action.
2. Do a	ll analytes mee list analytes, t	et the QC limit heir % recove	s of 80-120 % ry and action.	?	Yes	] No	
3. Show	v the calculatio	n for % recov	ery for one an	alyte.			
Anal	vte_V_ <u>LCS S</u>	RM 460-6512	<u>8/2-A</u> La	ab Value _ '	111.5_(	(99%)	
				Soil lim	its _67.0	6 - 132_	
LCS Raw V LCS True V	alue : <u>111.5</u> alue : <u>113</u> LCS %	5 mg/Kg mg/Kg 5 recovery =	LCS Raw Va	lue x 100 /alue	=	98.7	%
4. Com and 134 mg	ments: <u>The LC</u> /Kg. However,	SS "True Val	ues" listed for le concentratio	Cr and Ni on ranges w	on Form	n 7A-IN w ed as 70.	ere 236 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.

Page 15 of 21

			SERIA	L DILUTION AN	ALYSIS		
Serial	Dilution p	erformed	on samples	108 M014_15	.0 Dilutio	n Factor 4 ; :	20
Sampl	e matrix:	Sc	oil Wa	ater	Units: mg/	ˈkg ug/L	
ASSO	CIATED	SA	MPLES	AII	SDG	soil	samples
1.	Was a se	erial dilutio	n performed	at the correct fre	equency?		Yes No
action	lf			no,			give
aotion_							
2.	Was a fie	ld sample	used for se	rial dilution?			Yes No
action	lf			no,			give
action_			nie – 1 – 1				
3.	For all an	alytes gre	ater than te	n times the IDL a	fter dilution f	or 6010B and	d 25 times
	the EDL f	or 7000A	metnoas, w	as a serial dilutio	n performed	( 	n/a No
	lf	no,	list	analytes	and	reject	them.
4.	For all an	alytes that	t needed se	rial dilution analy	sis, was the (	QC limit of	
1	0 % D me If no, list t	et? hose ana	lytes outside	e the limits and q	ualify them.	<u>n/a</u> No	
5.	Show cale	culation fo	or % D for or	ne analyte analyz	ed by ICP.		
	Analyte _	_Cr	_			Lab value	_NC_
Sample	e value :		13.7				
Serial [	Dilution va	alue :	15.0				
Page 16	of 21					DPFS MAY 2	R/BEMQA 2002

	<u> </u>	Sample - Serial Dilution	<u>n) x 100</u>	1.1.25	
	Serial Dilution % D =	Sample value	=	NC	% D
Note: NC	= Not Calculated; sample	result <50x MDL (IDL) t	pefore dilution	n	

		MEI	HOD OF STANDA	RD ADDITION	(INISA)	
ASS nec	SOCIATED essary	SAMPLES		MSA	was	no
1.	If the pos was the N	st digestion s ISA perform	spike recovery for ied?	Methods 7000A	was outside th	ne QC limit
	lf	no,	explain	and	res No <u>N//</u> list	action
2.	Was the M If	ISA within th no,	ne linear range of th explain	e instrument? and	Yes No <u>N//</u> list	action
2.	Was the M If Was the M	ISA within th no, ISA sample	ne linear range of the explain	e instrument? and and	Yes No <u>N//</u> list ⁄? Yes No <b>[</b>	action.
3.	Was the M If Was the M If	ISA within th no, ISA sample no,	ne linear range of the explain and spikes analyze explain	e instrument? and ed consecutively and	Yes No N// list /? Yes No N list	action
2. 3. 4.	Was the M If Was the M If Was the si standard o	ISA within th no, ISA sample no,	ne linear range of the explain explain and spikes analyze explain and spikes analyze explain and spikes than 2	e instrument? and and and and and and and and and	Yes No N// list /? Yes No M list of the slope of th Yes No	A action

MAY 2002

5. Comments:

DPFSR/BEMQA MAY 2002

Page 19 of 21

SAMPLE RESULT VERIFICATION

ASS sam	OCIATE	D	S	AMPLES	AII		SDG
1.	Were all sample results reported within the				calibration range?	Yes	No
	lf	no,	list	affected	samples	and	action.
2.	Was t	Was the raw data free of any anomalies?		ny anomalies?			Yes No
	lf	no,	list	affected	samples	and	action.
	Was th If no, I <u>and S</u> <u>raw co</u> <u>There</u> in both	ne data pa ist affecte D) exhibite oncentratio fore, the re n the labor	ackage free d samples a ed incorrect on values in eported valu ratory report	of any computat and action. <u>Samp</u> ly reported Resu mg/L, rather that ues are under-re t and the associa	tional or transcript ole 460-23155-1 ( <u>lt, RL, MDL and L</u> an as mg/Kg dry-w ported by a nomir ated EDD results s	ion errors? and its MS, I Jnits values, veight values nal factor of s summary.	Yes No <u>DU</u> <u>as</u> 50x
	Was th If	ne % solid no,	s analysis p list	performed for all affected	nonaqueous sam samples	ples? Yes and	No N/A action.
	Show Sampl	the calcula e ID: _108	ation for % s 3_C018_0.0	solids for one sa (460-23155-1)	mple. Lab value	97.0%	
Vet	weight :	5.59	gm gm % :	Solids = Wet w	eight x 100 reight	= 97.0	%
3.	Verify recalcu Sampl	that non ulating the e _108_C	aqueous s result for o 018_0.0_	amples were in a s ne analyte in a s AnalyteCr	reported on a c ample. Lab value	dry weight _0.74 mg/Kg	basis by 9_
Raw value Final Net v	e ( vol	0.1785 m 50 m 1.0 g	ng/L Dilutio nL % So m mg/K	on = lids = [ (g dry weight =	4.0 97.0 mg/L x FV wet wgt x	<u>′ (ml) x Dil'n</u> (%Sol/100)	<u>-</u> = 36.8 m
age	20 of 21					DPFSF	R/BEMQA

Page 21 of 21

02 June, 2011

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

#### Re: <u>PPG – Site 108, Laboratory Job No. 460-23196-1</u>

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
 Laboratory:
 TestAmerica Laboratories, Inc.

 Hexavalent chromium (Cr<sup>+6</sup>)
 Laboratory:
 TestAmerica Laboratories, Inc.

 Total Metals (Cr, Ni, Sb, Tl, V)
 pH / Eh ; ORP
 Matrix:
 Non-Aqueous

 Reviewer:
 Chris Taylor
 Ketal
 Ketal
 Ketal

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<sub>4</sub>- / Cr(OH)<sub>3</sub> 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).
## Dresdner-Robin

Mr. Douglas Neumann

02 June, 2011

Sample ID	Lab ID		Date	Ana	lysis
108_	460-23196-	Matrix	Collected	Hex Cr	Metals
L014_0.0	1	S	02/17/11	Х	Х
L014_3.5	2	S	02/17/11	x	x
L014_7.5	3	S	02/17/11	x	х
L014_11.5	4	S	02/17/11	x	х
L014_14.5	5	S	02/17/11	x	х
L014_18.5	6	S	02/17/11	х	х
REP021711-3	7	S	02/17/11	х	х
FB021711	8	A	02/17/11	х	х
L012_0.0	9	S	02/17/11	х	Х
L012_3.5	10	S	02/17/11	х	х
L012_5.5	11	S	02/17/11	х	х
L012_9.5	12	S	02/17/11	Х	х
REP021711-2	13	S	02/17/11	х	х
M012_0.0	14	S	02/17/11	х	х
M012_3.5	15	S	02/17/11	х	Х
M012_5.5	16	S	02/17/11	х	Х
M012_9.5	17	S	02/17/11	х	х
M012_13.5	18	S	02/17/11	х	Х
F003_0.0	19	S	02/17/11	х	Х
F003_2.5	20	S	02/17/11	х	х
F003_4.5	21	S	02/17/11	x	х
F003_8.5	22	S	02/17/11	x	х
F003_12.5	23	S	02/17/11	X	Х
M010_0.0	24	S	02/17/11	X	х
M010_2.0	25	S	02/17/11	X	х
M010_6.0	26	S	02/17/11	X	х
M010_10.0	27	S	02/17/11	X	х
M010_REP021711-1	28	S	02/17/11	x	х
C004_0.0	29	S	02/17/11	X	х
C004_3.5	30	S	02/17/11	X	х
C004_6.5	31	S	02/17/11	X	Х
C004_10.5	32	S	02/17/11	Х	х
C004_14.5	33	S	02/17/11	X	х
M008_0.0	34	S	02/17/11	Х	х
M008_4.5	35	S	02/17/11	X	х
M008_8.5	36	S	02/17/11	X	х
M008 12.5	37	S	02/17/11	x	Х

S = Non-Aqueous Matrix

A = Aqueous Matrix

Page 2 of 4

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

EQA, Inc.

J23196-1\_dvr.doc

#### Dresdner-Robin Mr. Douglas Neumann

02 June, 2011

All samples were received one day from collection. Samples were received on ice at recorded temperature of  $3.8^{\circ}$ C.

#### 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 spike recoveries, duplicate precision values, reported % moisture (% solids) and reported Cr<sup>+6</sup> 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).

#### <u>SECTION E</u> 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.

EQA, Inc.

J23196-1\_dvr.doc

#### Dresdner-Robin Mr. Douglas Neumann

#### 02 June, 2011

Reported pH and eH (ORP) values and resulting ReDox (reducing or oxidizing) characteristics were randomly verified from the HCrO<sub>4</sub>- / Cr(OH)<sub>3</sub> 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

## **DATA DELIVERABLE REQUIREMENTS**

Site NamePPG SITE 108	Lab Job No460-23196-1
LocationNJ	Date of Review06/02/2011
Laboratory NameTestAmerica Edison	Client_Dresdner-Robin Environmental
ReviewerC. Taylor / EQA, Inc	Client Contact_Douglas Neumann

#### GENERAL REQUIREMENTS: Circle YES or NO and list the deviations at the bottom: **Permanently Bound** N/A G. Methodology Review Yes No Α. Paginated Yes No H. Uninitialed Strikeovers Β. Yes No **Title Page** Yes No C. Ι. Legible Photocopies Yes No **Table of Contents** Yes No **Consistent Dates** D. J. Yes No Ε. Chain of Custody Yes No K. Digestion Log Yes No

F. 1	Non-conformance Summa	Yes	No	
			1	

Describe	any	deviations	from	the	requirements
	74				

## HOLDING TIMES FOR METALS

s ( ) or Nona	queous ( X	1	
SAMPLE FIELD ID 108	DATE of SAMPLE COLLECTION	ICP ANALYSIS DATE	HOLDING TIME EXCEEDED
	02/17/11	02/25/11	NO
BEP021711-3	02/17/11	02/25/11	NO
FB021711	02/17/11	02/23/11	NO
	02/17/11	02/23/11	NO
	02/17/11	02/24/11	NO
1.012.5.5	02/17/11	02/24/11	NO
	02/17/11	02/24/11	NO
BED021711-2	02/17/11	02/24/11	NO
M012 0 0	02/17/11	02/24/11	NO
M012_3.5	02/17/11	02/24/11	NO
M012 5 5	02/17/11	02/24/11	NO
M012 9 5	02/17/11	02/24/11	NO
M012_3.5	02/17/11	02/24/11	NO
F003.0.0	02/17/11	02/24/11	NO
F003 2 5	02/17/11	02/24/11	NO
F003 4 5	02/17/11	02/24/11	NO
F003 8 5	02/17/11	02/24/11	NO
F003 12 5	02/17/11	02/24/11	NO
M010_0.0	02/17/11	02/24/11	NO
M010 2.0	02/17/11	02/24/11	NO
M010_6.0	02/17/11	02/24/11	NO
M010_10.0	02/17/11	02/24/11	NO
M010 BEP021711-1	02/17/11	02/23/11	NO
C004 0.0	02/17/11	02/24/11	NO
C004 3.5	02/17/11	02/24/11	NO
C004 6.5	02/17/11	02/24/11	NO
C004 10.5	02/17/11	02/24/11	NO
C004 14.5	02/17/11	02/24/11	NO
M008 0.0	02/17/11	02/24/11	NO
M008 4.5	02/17/11	02/24/11	NO
	SAMPLE FIELD ID 108_ L014_0.0 L014_3.5 L014_7.5 L014_11.5 L014_14.5 L014_14.5 L014_18.5 REP021711-3 FB021711 L012_0.0 L012_3.5 L012_5.5 L012_9.5 REP021711-2 M012_0.0 M012_3.5 M012_5.5 M012_9.5 M012_9.5 M012_9.5 M012_9.5 M012_9.5 M012_9.5 F003_2.5 F003_2.5 F003_2.5 F003_4.5 F003_8.5 F003_8.5 F003_8.5 F003_12.5 M010_0.0 M010_2.0 M010_0.0 M010_2.0 M010_10.0 M010_2.0 M010_10.0 M010_10.0 M010_10.0 M010_10.0 M010_10.0 M010_10.0 M010_10.0 M010_10.0 M010_10.0 M010_10.0 M010_10.0 M010_2.0 M010_6.5 C004_6.5 C004_14.5 M008_0.0 M008_4.5	S ( )     Or     Nonaqueous ( X       SAMPLE 108_     DATE of SAMPLE COLLECTION       L014_0.0     02/17/11       L014_3.5     02/17/11       L014_11.5     02/17/11       L014_11.5     02/17/11       L014_14.5     02/17/11       L014_14.5     02/17/11       L014_18.5     02/17/11       L014_18.5     02/17/11       L012_0.0     02/17/11       L012_3.5     02/17/11       L012_5.5     02/17/11       L012_9.5     02/17/11       L012_9.5     02/17/11       M012_0.0     02/17/11       M012_0.0     02/17/11       M012_13.5     02/17/11       M012_13.5     02/17/11       M012_13.5     02/17/11       F003_12.5     02/17/11       F003_12.5     02/17/11       F003_12.5     02/17/11       F003_12.5     02/17/11       M010_0.0     02/17/11       M010_0.0     02/17/11       M010_10.0     02/17/11       M010_10.0     02/17/11 <td>S     Or     Nonaqueous     ( X )       SAMPLE FIELD ID 108_     DATE of SAMPLE COLLECTION     ICP ANALYSIS DATE       L014_0.0     02/17/11     02/25/11       L014_3.5     02/17/11     02/25/11       L014_15.     02/17/11     02/25/11       L014_14.5     02/17/11     02/25/11       L014_18.5     02/17/11     02/25/11       L014_18.5     02/17/11     02/25/11       REP021711-3     02/17/11     02/25/11       FB021711     02/17/11     02/25/11       L012_0.0     02/17/11     02/24/11       L012_5.5     02/17/11     02/24/11       L012_5.5     02/17/11     02/24/11       M012_0.0     02/17/11     02/24/11       M012_0.0     02/17/11     02/24/11       M012_3.5     02/17/11     02/24/11       M012_9.5     02/17/11     02/24/11       M012_9.5     02/17/11     02/24/11       M012_13.5     02/17/11     02/24/11       M012_13.5     02/17/11     02/24/11       F003_0.0     <td< td=""></td<></td>	S     Or     Nonaqueous     ( X )       SAMPLE FIELD ID 108_     DATE of SAMPLE COLLECTION     ICP ANALYSIS DATE       L014_0.0     02/17/11     02/25/11       L014_3.5     02/17/11     02/25/11       L014_15.     02/17/11     02/25/11       L014_14.5     02/17/11     02/25/11       L014_18.5     02/17/11     02/25/11       L014_18.5     02/17/11     02/25/11       REP021711-3     02/17/11     02/25/11       FB021711     02/17/11     02/25/11       L012_0.0     02/17/11     02/24/11       L012_5.5     02/17/11     02/24/11       L012_5.5     02/17/11     02/24/11       M012_0.0     02/17/11     02/24/11       M012_0.0     02/17/11     02/24/11       M012_3.5     02/17/11     02/24/11       M012_9.5     02/17/11     02/24/11       M012_9.5     02/17/11     02/24/11       M012_13.5     02/17/11     02/24/11       M012_13.5     02/17/11     02/24/11       F003_0.0 <td< td=""></td<>

SAMPLE LAB ID	SAMPLE	DATE of	ICP	HOLDING
	FIELD ID	SAMPLE	ANALYSIS	TIME
Page 2 of 22				DPFSR/BEMQA MAY 2002

6. 1	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\_\_\_\_\_

TEMP\_3.8<sup>0</sup>C\_\_\_

COOLER

PRESERVATION\_FB PH<2\_

## SW-846 INORGANICS-4 INSTRUMENT CALIBRATION, INITIAL CALIBRATION CHECK (ICC) and INITIAL CALIBRATION VERIFICATION (ICV)

ASSC	OCIATED	SAMPLE	SAll	SDG	samples
1.	Was the ICF If no, explair	9 instrument (601 n and list action.	0B) properly standa	rdized? Yes N	No N/A
2.	Was the IC\	//ICC analyzed ir	nmediately after the	systems were calibi	rated?
action	lf 	no,	explain	and	Yes No list
3.	Was the ICV	//ICC analyzed fo	or every analyte?		Yes No
action	lf 	no,	explain	and	list
4.	Do all ICV/IC If no, list affe	C analytes mee ected analytes, th	t the QC requiremen eir % recovery, asso	ts for % recovery?	res No d action.
5.	Show calcula	ation for the % re	covery of one ICV a	nalyte analyzed by I	ICP.
	AnalyteSt	(ICP2;	ICV 460-65559/5)	Lab Value	94%
Raw c True c	onc.: <u>938.3</u> onc.: <u>1000</u>	_ ug/L ICV 02/2 _ ug/L	23/11 18:20	Lab value:	<u>94</u> %
		Calculat	ted recovery = Haw	conc./ I rue conc.=	93.8 %

V-8	346 INORGANICS-5			
	SPECIFIC COMMENTS:			
10	NTINUING CALIBRATION VERIFICATIO	ON (CCV) and CALIBR	ATION CHECK ST	ANDARD (CCS)
S	OCIATED SAMPLES	All	SDG	samples
_				
	a. Was the CCV/CCS perform	ned at the minimum t	frequency of 10%	Yes
io	lf n	no,		list
	b. Was the CCV/CCS perfor analysis?	med after ten samp	oles and at the	end of sample
	lf action.	no,		list
	Were the CCV/CCS standards a	analyzed for all analy	/tes?	Yes
	If no, list affected analytes, their	associated samples	and action.	
				, 
	Was the CCV/CCS concentration	n near the midpoint	of the calibration	curve?
				Yes
	If we list offected each tee, their	a second s	and asting	

Page 5 of 22

Do all CCV/CCS analytes meet the QC requirement for % recovery? Yes
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.

AnalyteV (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 recov	/ery = Raw	conc./True conc.=	98.0	%

6. SPECIFIC COMMENTS\_

No

## METHOD BLANK SUMMARY

Method	Blank IDMB4	460-65150/1-A^2	Samp	le matrix: Soil	Water
	MB460-65 MB460-65 MB460-65	5488/1-A^2 6490/1-A^2 6149/1-A^2	Units:	mg/k	g] ug/L
Did the	frequency of the	e method blank analy	sis meet method	requirements?	Mag
lf	no,	explain	and	note	action
- 19 P					

ANALYTE	CONCENTRATION	<mdl< th=""><th>COMMENTS / ACTION</th></mdl<>	COMMENTS / ACTION
Cr, Ni, Sb, Tl, V	U		n/a
			1. 전 1. 여기 이 것 같아.
	11 전에 14 M M		
지하는 전 가슴			
SSOCIATED	SAMPLES	AII	SDG so

Page 7 of 22

Page 8 of 22

		CALIBRATIC	ON BLANKS			
SOCIATED	SAMI	PLES	AII	SDG		soi
Were the i	nitial calibratic	on blanks an	alvzed for all	analytes and r	run after	 the
ICV/ICC?	o, list	affected	analyte	es, and	Yes act	No ion.
Was the ab	solute value for	r all analytes i and qualify th	n the calibratic nem. <i>TI in ICE</i>	on blank below th B and CCBs brac	he MDL? Yes cketing	No
<u>samples 46</u> <u>samples we</u> Were the cor	0-23196-34 thr are non-detect ( ntinuing calibra	<u>rough -37 was</u> ( <u>U) for TI; no (</u> ition blanks ar	S > MDL, <rl. i<br="">QA action necession alyzed for all a</rl.>	<i>However all brac <u>essary.</u> analytes and run</i>	<u>cketed</u> n after	
the CCV/CCS	5?		amples and a	tion	Yes	No
						_
	SOCIATED ples Were the independent of the content of the cov/ccs of the c	SOCIATED   SAMI     iples	SOCIATED   SAMPLES     iples	SOCIATED   SAMPLES  All     uples	SOCIATED   SAMPLES   _All   SDG     iples	SOCIATED   SAMPLES   _AII   SDG     iples

## **ICP INTERFERENCE CHECK SAMPLE**

ASSOCIATED samples	SAMPLES		AII	;	SDG
1. Was an ICP interfe	erence check sample pe	erformed at the	e correct frequen	cy?	
lf no action.	, note	any	deviations	Yes	No and
	internet and interferent		todQ	Mag	
2. Were the analytes	interest and interferent	s for ICS repoi	ned?	res	NO
If deviations		no,		_	note
3. Did all the required	analytes of interest in t	he ICS meet th	ne QC limit of 80	-120%?	
				Yes	No
If no, list the an	alytes, the % recovery,	associated sa	mples and the ac	ction	
4. Show the calculation	on for the % recovery fo	or one analyte	in the ICS.		
Analyte _ Ni	ICSAB ID:460	-65559/81	Lab value _89	9%	_
Raw conc.: <u>88.8</u> u True conc.: <u>100</u> u	g/L g/L		Lab value:	89 %	%
Page 9 of 22			D	PFSR/BEN AY 2002	IQA

SW-	846 INORGANICS-10			2
		Calculated recovery = Raw conc./True conc.=	88.8	%
5.	COMMENTS			
Э.				

SW-84	46 IN(	DRGANICS-1 MATRIX S	I <b>1</b> PIKE (MS	) and MAT	RIX SPIK	E DUPLICA	TE (MSD)	Part 1 of 2
Spike	Anal	ysis perform	ned on sai	mple108_ (460	_M010_RI )-23196-2	EP-1 MS 8 MS)	% Solids_	_89.0
Samp	le ma	atrix:	Soil	Water				
Units:			mg/kg	ug/L				
ASSC accep not fro (-1 th repres	DCIA1 <u>otable</u> <u>om th</u> <u>nroug</u> <u>senta</u>	ED SAMP All other S is SDG and h -7; -29 tive of this S	LES: <u>460</u> DG samp not from through DG's mat	-23196-9 th les were as this site. No -37), since rix characte	arough -2 sociated v QA action these b ristics.	8. Recoveri vith batch m n was consid atch spikes	es for 2319 atrix spikes dered for oth s' matrix m	96-28 were which were er samples ay not be
1.	Was	the MS/MS	D perform	ned at the co	orrect freq	uency?		Yes No
	lf	no,		note	deviat	ions	and	action
2. sampl	Was	the MS/MS	D analyse no,	es performe reje	d on a fiel ect	d sample? all		Yes No associated
3.	a.	Were two (2 analyte (i.e.	2) analytic , ICP and	al methods AA) ?	used to ob	otain reporte	d values for	
		lf		yes,		list		analytes

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

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

Page 11 of 22

DPFSR/BEMQA MAY 2002

Page 12 of 22

## 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 %?

Part 2 of 2

Yes

No

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

<u>23173-3</u> Cr (889%), V (159%) samples -1 through -7 23286-5 Sb (61%) samples -29 through -33

ACTION: n/a ; see Comments below.

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

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

COMMENTS: <u>One batch Duplicate (460-23173-3 DU) was reported with Cr</u> outside limits; <u>this sample was not from this SDG or site, and the resultswere not</u> 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	(460-231	96-28 MS)	Lab value	90%
Spike Added:	56.2		(spike - sample) x	<u>: 100</u>	
Spike conc:	50.6	% rec. =	spike added	1000 - E	90.0 %
Sample conc:	2.2 U				

b. Show calculation for % RPD for one analyte.

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

Sample :	17.9		Sample - Duplicate x 100			
Duplicate:	17.0	% RPD =	(Sample + Duplicate) / 2	=	5.2	%RPD

SW-	846 INORGANIC	S-14				
		POS	T-DIGESTION SPIK	E ANALYSIS		
Post	t Digestion Spik	e Analysis p	erformed on sample	PDS was not reported_		<u> -</u> -
Sam	ple matrix:	Soil	Water	% Solids		
Unit	S:	mg/kg	ug/L			
ASS	OCIATED				SAMP	LES
					an she	
1.	Was post-dig	estion spike	analysis performed	at the correct frequency?	Vee	Nie
	If no, list the	analyte(s) a	nd action.		res	INO
- -						
<u></u>						
2.	Was post-dig	estion spike	performed on a field	d sample? Yes	s No	
	lf no, list ana	lytes and qu	alify them.			
		생님				
3.	List the analy performed but	yte(s), and t it still did not	heir % recovery when meet the QC criteri	ere post-digestion spike a and action.	nalysis	was
4.	Show the ca spike analysi	lculation for s was perfor	% recovery for at le med.	ast one analyte where po	st-diges	tion
	Analyte			Lab value	э	

Page 14 of 22

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

	LABORAT	ORY CONTROL S	SAMPLE (LCS)	
Samp	ole matrix: Soil Wate	7		
Units	mg/kg ug/L			
ASSC samp	DCIATED S les	AMPLES	AII	SDG
1.	Was the laboratory control	sample performed	at the correct free	uency?
	lf no,		give	action.
<u>-</u>				
2.	Do all analytes meet the QC	limits of 80-120 %	S? Yes	s No
	If no, list analytes, their % re	ecovery and action.		
3.	Show the calculation for % I	ecovery for one an	alyte.	
	Analyte _Cr_ LCS SRM 46	0-65150/2-A	Lab Value _ 2	36_ (100%)
			Soil limits _70	.8 – 129 *
LCS F	Raw Value : 236.2 mg/k	(g		
LU3 1	The value mg/r	LCS Raw Va	lue x 100	
	LCS % recover	y = LCS True	/alue =	100 %
4.	Comments: * The LCSS "T	rue Values" listed	for Cr and Ni on	Form 7A-IN were
200 a	nd 73.2 to 127 ma/Ka rospo	acceptable concer	ination ranges we	re iisteu as 70.8 to

<u>129 and 73.2 to 127 mg/Kg, respectively. Actual found concentrations were very close to</u> the listed true values for Cr and Ni. The acceptable recovery ranges for these elements are presumed to be incorrectly listed.

Page 16 of 22

		SERIA	L DILUTION A	NALYSIS		
Seria	I Dilution perform	ned on samples	107_E027_ (460-23077	15.5 Dilut -26)	ion Factor 4 ;	20
Sam	ole matrix:	Soil W	ater	Units: m	g/kg ug/	Ĺ
ASS	DCIATED	SAMPLES	AII	SDG	soil	samples
1.	Was a serial di	lution performe	d at the correct	frequency?		Yes No
action	lf 1		no,			give
2.	Was a field sar	nple used for se	erial dilution?			Yes No
actior	lf 1		no,			give
3.	For all analytes the EDL for 700	greater than te DOA methods, w	en times the IDL /as a serial dilu	after dilution	n for 6010B ar d?	nd 25 times
	lf no,	list	analytes	and	reject	them.
4.	For all analytes 10 % D met? If no, list those	that needed se analytes outside	erial dilution ana e the limits and	alysis, was the qualify them.	e QC limit of n/a No	
5.	Show calculation	on for % D for o	ne analyte anal	yzed by ICP.		
	AnalyteCr	(460-231	96-28)	La	b value _NC	%_
Samp	le value :	17.9				
Page 1	7 of 22					SR/BEMQA

Serial D	ilution value : <u>17.7</u>				
		(Sample - Serial Dilution	<u>n) x 100</u>		
	Serial Dilution % D =	Sample value	=	NC	% D
Note: NO	C = Not Calculated; sample	e result <50x MDL (IDL) b	efore dilutio	n	

NSA)	RD ADDITION (I	HOD OF STANDA	MET		
was	MSA	AMPLES	D S/	ASSOCIATED necessary	ASS nec
was outside the	Methods 7000A	pike recovery for l ed?	oost digestion s e MSA perform	I. If the p was the	1.
es No <u>N/A</u> list	and	explain	no,	lf	
Yes No N/A	e instrument?	e linear range of th	e MSA within th	2. Was the	2.
list	and	explain	no,	lf	
Yes No N/A	d consecutively?	and spikes analyze	e MSA sample	B. Was the	3.
list	and	explain	no,	lf	
	20% difference of	SA plot less than 2	e slope of the M	. Was the	4.
f the slope of the Yes No [			d curve?	standard	
	was outside the es No N/A list Yes No N/A list Yes No N/A list	MSA was	AMPLES  MSA   was     spike recovery for Methods 7000A was outside the ed?   Yes   No     yes   No   N/A     explain   and   list     he linear range of the instrument?   Yes   No     explain   and   list     and spikes analyzed consecutively?   Yes   No     explain   and   list	SAMPLES  MSA   was     oost digestion spike recovery for Methods 7000A was outside the a MSA performed?   Yes   No     no,   explain   and   list     a MSA within the linear range of the instrument?   Yes   No   N/A     no,   explain   and   list     a MSA within the linear range of the instrument?   Yes   No   N/A     no,   explain   and   list     and   list   Ist   Ist     and   list   Ist   Ist     and   list   Ist   Ist	SOCIATED   SAMPLES  MSA   was     essary

5. Comments:

DPFSR/BEMQA MAY 2002

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SAMPLE RESULT VERIFICATION

ASS samp	OCIATEI	<b>D</b>	S/	AMPLES	AII		SDG
1.	Were a	all sample	results rep	orted within the o	calibration range	? Yes	No
	lf	no,	list	affected	samples	and	action.
2.	Was th	e raw data	a free of an	y anomalies?			Yes No
	lf	no,	list	affected	samples	and	action.
3.	Was th	e data pa	ckage free	of any computat	ional or transcrip	tion errors?	Yes No
	lf	no,	list	affected	samples	and	action.
4.	Was th	e % solids	analysis p	erformed for all	nonaqueous sam	nples? Yes	No N/A
a í	IT .	no,	list		samples	and	action.
5.	Show t Sample	he calcula e ID: _108	tion for % s _M010_RE	solids for one sa P021711-1	mple. Lab value	89.0%	
Dry v Vet v	veight : weight :	4.79 g 5.38 g	jm jm % S	<u>Dry w</u> Solids = Wet w	eight x 100 eight	= 89.0	%
6.	Verify recalcu	that nona lating the	aqueous s result for o	amples were in a s	eported on a ample.	dry weight N/A	basis by
	Sample	e_108_M	010_REP02	21711-1 Analyt	eV Lab	value _22.9	mg/Kg_
Raw	value 0	.1022 m	g/L Dilutio	on =	4		

04 June, 2011

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

#### Re: <u>PPG – Sites 107 & 108, Laboratory Job No. 460-23391-1</u>

487 Shoddy Hollow Road

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		
	<u>Fractions</u> Hexavalent chromium (Cr <sup>+6</sup> ) Total Metals (Cr, Ni, Sb, Tl, V) pH / Eh ; ORP	Laboratory:	TestAmerica Laboratories, Inc.
	Report No.: <u>460-23391-1</u>	Matrix:	Non-Aqueous
Reviewer:	Chris Taylor		
Prepared By	Environmental Quality Associates	Inc	

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<sub>4</sub>- / Cr(OH)<sub>3</sub> 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).

Dresdner-Robin

Mr. Douglas Neumann

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

S = Non-Aqueous Matrix A = Aqueous Matrix Total Samples = 28

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  $3.4^{\circ}$ C.

## 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.

EQA, Inc.

J23391-1\_dvr.doc

Dresdner-Robin Mr. Douglas Neumann

04 June, 2011

Reported spike recoveries, duplicate precision values, reported % moisture (% solids) and reported Cr<sup>+6</sup> 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<sub>4</sub>- / Cr(OH)<sub>3</sub> 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

EQA, Inc.

J23391-1\_dvr.doc

## Dresdner-Robin

#### Mr. Douglas Neumann

## 04 June, 2011

	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

## DATA DELIVERABLE REQUIREMENTS

Site Name PPG SITES 107 & 108	Lab Job No460-23391-1
LocationNJ	Date of Review06/04/2011
Laboratory NameTestAmerica Edison	Client_Dresdner-Robin Environmental
Reviewer C. Taylor / EOA. Inc.	Client Contact Douglas Neumann

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

-					
F.	Non-conformance Summ	a Yes No			
E.	Chain of Custody	Yes No	К.	Digestion Log	Yes No
D.	Table of Contents	Yes No	J.	Consistent Dates	Yes No
C.	Title Page	Yes No	Ι.	Legible Photocopies	Yes No
В.	Paginated	Yes No	H.	Uninitialed Strikeovers	Yes No
Α.	Permanently Bound	N/A	G.	Methodology Review	Yes No

Describe	any	deviations	from	the	requirements

HOLDING TIMES FOR METALS						
Matrix: Aqueo	ous (	) or Nonaq	ueous (X)			
SAMPLE LAB			DATE of	ICP	HOLDING	
ID		SAMPLE	SAMPLE	ANALYSIS	TIME	
460-23391-	SITE ID	FIELD ID	COLLECTION	DATE	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<sup>o</sup>C\_\_\_

PRESERVATION\_FB PH<2\_

## SW-846 INORGANICS-3 INSTRUMENT CALIBRATION, INITIAL CALIBRATION CHECK (ICC) and INITIAL CALIBRATION VERIFICATION (ICV)

ASSC	DCIATED	SAMPLES	AII	SDG	sam	ples
1.	Was the ICP If no, explain	instrument (6010B) pr and list action	operly standardiz	zed? Yes No	N/A	
2.	Was the ICV	/ICC analyzed immedi	ately after the sys	stems were calibra	ted?	Na
action	lf 	no,	explain	and	res	list
3.	Was the ICV	ICC analyzed for ever	y analyte?		Yes	No
action	lf	no,	explain	and		list
4.	Do all ICV/IC	C analytes meet the C	C requirements f	or % recovery? Ye	s No	
	If no, list affe	cted analytes, their %	recovery, associa	ated samples, and	action.	
5.	Show calcula	tion for the % recovery	of one ICV anal	yte analyzed by IC	P.	
	AnalyteCr_	(ICP2; ICV 46	60-65994/5)	Lab Value9	9%	
Raw c True c	conc.: 4948 conc.: 5000	ug/L ICV 02/28/11 ug/L	19:37	Lab value:	99	%
		Calculated rec	covery = Raw cor	nc./True conc.=	99.0	%
Page 3	of 21			DP	FSR/BEN	IQA

6.	SPECIFIC				
	COMMENTS				
со	NTINUING CALIBRATION VERI	IFICATION (CCV) and CA	LIBRATION CHI	ECK STANDAR	D (CCS)
ASS	OCIATED SAMF	PLESAII	SDO	G s	amples.
		portormod at the minim	um fraguanau	of 10% 2	
•	a. Was the CCV/CCS	performed at the minim	um frequency	of 10%?	Yes
·	a. Was the CCV/CCS p	performed at the minim no,	um frequency	of 10%?	Yes list
·	a. Was the CCV/CCS p If nb. Was the CCV/CCS	performed at the minim no,	um frequency	of 10%?	Yes list
actic	a. Was the CCV/CCS p If b. Was the CCV/CCS analysis?	performed at the minim no, performed after ten s	um frequency	of 10%?	Yes list sample Yes
ctic	a. Was the CCV/CCS p If b. Was the CCV/CCS analysis?	performed at the minim no, performed after ten s no,	um frequency amples and a	of 10%?	Yes list sample Yes
	a. Was the CCV/CCS p If b. Was the CCV/CCS analysis? If action. Were the CCV/CCS stan	performed at the minim no, performed after ten s no,	um frequency amples and a analytes?	of 10%?	Yes list sample Yes list
Ictic	a. Was the CCV/CCS p If b. Was the CCV/CCS analysis? If action Were the CCV/CCS stan If no, list affected analyte	performed at the minim no, performed after ten s no, dards analyzed for all a	um frequency amples and a analytes?	of 10%? at the end of	Yes list sample Yes list
l. Ictic	a. Was the CCV/CCS p If b. Was the CCV/CCS analysis? If action. Were the CCV/CCS stan If no, list affected analyte	performed at the minim no, performed after ten s no, dards analyzed for all a s, their associated sam	um frequency amples and a analytes?	of 10%? at the end of	Yes list Sample Yes list
actic	a. Was the CCV/CCS p If b. Was the CCV/CCS analysis? If action Were the CCV/CCS stan If no, list affected analyte	performed at the minim no, performed after ten s no, dards analyzed for all a s, their associated sam	um frequency amples and a analytes?	of 10%? at the end of	Yes list sample Yes list
1. actic	a. Was the CCV/CCS p If b. Was the CCV/CCS analysis? If action Were the CCV/CCS stan If no, list affected analyte  Was the CCV/CCS conce	performed at the minim no, performed after ten s no, dards analyzed for all a s, their associated sam	um frequency amples and a analytes? uples and actic	of 10%? at the end of on.	Yes list sample Yes list

Page 4 of 21

4. Do all CCV/CCS analytes meet the QC requirement for % recovery? Yes 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.

Analy	rte <u>Sb</u>		(ICP2 ; CCV 460-65994/56)	Lab value _96%
Raw conc.:	956.3	ug/L	CCV 03/01/11 01:19	Lab value: <u>96</u> %
True conc.:	1000	ug/L	Calculated recovery = Raw co	onc./True conc.= <b>95.6</b> %

6. SPECIFIC COMMENTS

No

**METHOD BLANK SUMMARY** 

Did the	frequency of the	e method blank analy	sis meet methoo	d requirements	? Yes No

ANALYTE	CONCENTRATION	<mdl< th=""><th><b>COMMENTS / ACTION</b></th></mdl<>	<b>COMMENTS / ACTION</b>
Cr, Ni, Sb, Tl, V	U		n/a
	2 : 이 이 한 한 한 한 한 이 이		
			15 C - 1 C - 1 - 1

		CALIBR	ATION BLANKS			
ASS sam	OCIATED ples	SAMPLES	AII	SDG		soi
1.	Were the init	ial calibration blanks	analyzed for all	analytes and ru	ın after	the
	lf no,	list affe	cted analyte	s, and	Yes ac	No tion.
-						
2.	Was the absol	lute value for all analy	tes in the calibratio	n blank below the	e MDL? Yes	No
2.	Was the absol If no, list affect <u>bracketing and</u> affected samp	lute value for all analy ted analytes and qual <u>alysis of 23391-14. No</u> ole.	tes in the calibration ify them. <u><i>TI in ICB</i> o action taken, since</u>	n blank below the <u>and CCB &gt;MDL</u> e TI non-detect (l	e MDL? Yes <u>, <rl< u=""> <u>U) in</u></rl<></u>	No
2. 3.	Was the absol If no, list affect <u>bracketing and</u> <u>affected samp</u> Were the contin the CCV/CCS?	lute value for all analy ted analytes and qual <u>alysis of 23391-14. No</u> <u>de.</u> nuing calibration blank	tes in the calibration ify them. <u><i>TI in ICB</i></u> o action taken, since as analyzed for all a	n blank below the <u>and CCB &gt;MDL</u> e TI non-detect (l	e MDL? Yes <u>, <rl< u=""> <u>U) in</u> after</rl<></u>	No
2. 3.	Was the absol If no, list affect <u>bracketing and</u> <u>affected samp</u> Were the contir the CCV/CCS?	lute value for all analy ted analytes and qual <u>alysis of 23391-14. No</u> <u>de.</u> nuing calibration blank	tes in the calibration ify them. <u><i>TI in ICB</i></u> o action taken, since as analyzed for all a	n blank below the <u>and CCB &gt;MDL</u> <del>e TI non-detect (I</del> analytes and run a	e MDL? Yes <u>, <rl< u=""> <u>U) in</u> after Yes</rl<></u>	No
2.	Was the absolution of the second seco	lute value for all analy ted analytes and qual <u>alysis of 23391-14. No</u> <u>le.</u> nuing calibration blank ted analytes, associat	tes in the calibration ify them. <u><i>TI in ICB</i></u> o action taken, since as analyzed for all a ed samples and act	n blank below the <u>and CCB &gt;MDL</u> analytes and run a	e MDL? Yes , <u><rl< u=""> <u>U) in</u> after Yes</rl<></u>	No
2. 3.	Was the absolution of the second seco	lute value for all analy ted analytes and qual <u>alysis of 23391-14. No</u> <u>de.</u> nuing calibration blank ted analytes, associat	tes in the calibration ify them. <u><i>TI in ICB</i></u> <u>o action taken, since</u> as analyzed for all a ed samples and act	n blank below the <u>and CCB &gt;MDL</u> analytes and run a	e MDL? Yes , <u><rl< u=""> <u>U) in</u> after Yes</rl<></u>	No
2. 3.	Was the absolution of the continue of the context of the c	lute value for all analy ted analytes and qual <u>alysis of 23391-14. No</u> <u>de.</u> nuing calibration blank ted analytes, associat	tes in the calibration ify them. <u><i>TI in ICB</i></u> <u><i>action taken, since</i></u> as analyzed for all a ed samples and act g calibration blanks	n blank below the <u>and CCB &gt;MDL</u> analytes and run a tion	e MDL? Yes <u>, <rl< u=""> <u>U) in</u> after Yes</rl<></u>	No

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Page 7 of 21
ASSOCIATED samples	SAMPLES	AII	SDG
1. Was an ICP interfere	ence check sample perform	ned at the correct freque	ncy?
If no, action	note a	ny deviations	Yes No and
2. Were the analytes in	terest and interferents for length	CS reported?	Yes No note
3. Did all the required a	nalytes of interest in the IC	S meet the QC limit of 80	0-120%? Yes No
If no, list the analy	rtes, the % recovery, assoc	ciated samples and the a	action
4. Show the calculation Analyte _Sb	for the % recovery for one ICSAB ID:460-6599	analyte in the ICS. 94/64 Lab value _9	90%
Raw conc.: <u>90.2</u> ug/ True conc.: <u>100</u> ug/	- - Calculated recovery =	Lab value: Raw conc./True conc.=	90 % 90.2 %

DPFSR/BEMQA MAY 2002

Page 8 of 21

# 5. COMMENTS\_

SW-846 II	NORGANICS-10 MATRIX SPIKE	(MS) and MAT	TRIX SPIKE DUPL	ICATE (MSD)	
					Part 1 of 2
Spike An	alysis performed o	n sample108 (46	_B006_3.5 MS 0-23391-19 MS)	% Solids	86.3
Sample n	natrix: Soil	Water			
Units:	mg/k	g ug/L			
ASSOCIA acceptab SDG (108 1. Wa	ATED SAMPLES: le. All other SDG s 3 M018 12.0 MS) as the MS/MSD pe	460-23391-9 t samples were a Recoveries wer	hrough -27. Recaused with a sociated with a so	overies for 23 batch matrix s	3391-19 were pike from this
					Yes No
lf	no,	note	deviations	and	action
2. Wa	- as the MS/MSD an	alyses performe	ed on a field samp	le?	Yes No
lf samples	no,	rej	ect	all	associated
3. а.	Were two (2) ana analyte (i.e., ICP	alytical methods and AA) ?	used to obtain rep	ported values f	or one
	If	VAS	liet		Yes No
		ycs,	1151		analytes
		Webstein auf de			
<u> </u>					
b.	Was MS/MSD ar	alysis performe	ed using both meth	ods for that ar	nalvte?

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 %?							
	If no, list % recove	ery in parenthesis next to the analyte out and action	Yes No					
	ACTION: <u>n/a</u>							
5.	Did the Relative Po 20% RPD?	ercent Difference (RPD) for all analytes meet the re Ye	equirement of					
	COMMENTS: <u>Duplicate results w</u> applicable, based a. Show calculat	vere evaluated on either %RPD or absolute differer on concentration. tion for % recovery for one analyte.	<u>nce, as</u>					
	AnalyteSb	(460-233981-19 MS) Lab value	_85%					
Spi	ke Added: 58.0	(spike - sample) x 100						
Spik Sarr	e conc: <u>49.5</u> ple conc: 2.3 U	% rec. = spike added =	85.3 %					
	b. Show calculat	ion for % RPD for one analyte.						
	AnalyteCr	(460-23391-8 DU) Lab value _2	?%_ RPD					
San	nple : 12.7	Sample - Duplicate x 100						
Dup	licate: 13.0	% RPD = (Sample + Duplicate) / 2 =	2.3 %RPD					

SW	-846 INORGANI	CS-13 POS	T-DIGESTION SPIR	(E ANALYSIS
Pos	t Digestion Spi	ke Analysis p	erformed on sample	ePDS was not reported
San	nple matrix:	Soil	Water	% Solids
Unit	s:	mg/kg	ug/L	
ASS	SOCIATED			SAMPLES
		4 <b>1</b> - 1		
1.	Was post-di	gestion spike	analysis performed	at the correct frequency?
	If no, list the	analyte(s) a	nd action.	Yes No
2.	Was post-di If no, list ana	gestion spike alytes and qu	performed on a fiel alify them.	d sample? Yes No
3.	List the ana performed b	lyte(s), and t ut still did not	heir % recovery wh meet the QC criteri	ere post-digestion spike analysis was a and action. N/A
4.	Show the ca spike analys	alculation for is was perfor	% recovery for at le med.	east one analyte where post-digestion
	Analyte	<u> </u>		Lab value
Page	13 of 21			DPFSR/BEMQA MAY 2002

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

		L/	BORATOF	RY CONTRO	DL SAI	MPLE (LCS)		
Sam	ple matrix:	Soil	Water					
Unite	s:	mg/kg	ug/L					
ASS sam	OCIATED ples		SAM	IPLES		_All -		SDG
1.	Was the	laboratory	control san	nple perform	ned at	the correct freq	uency? Yes	No action.
2.	Do all an	alytes mee	t the QC lim	nits of 80-12	0 %?	Yes	No	
	If no, list	analytes, tl	neir % recov	very and act	ion			
3.	Show the	calculatio	n for % reco	overy for one	e analy	te.		
	Analyte _	Ni_ <u>LCS</u>	<u>SRM 460-6</u>	5753/2-A		Lab Value _ 14	45.4_ (108	3%)
						Soil limits _73.	2 – 127 *_	_
LCS	Raw Value	: 145	mg/Kg					
LCS	True Value	: 134	mg/Kg					41 P.)
				LCS Raw	Value	<u>x 100</u>	k di k	
		LCS %	recovery =	LCS Tr	ue Val	ue =	108	%
4. <u>236 a</u>	Commenand 134 mg	ts: * <u>The L</u> /Kg. Howe	<u>.CSS "True</u> ver, the acc	Values" list ceptable con	ted for centra	Cr and Ni on tion ranges wer	Form 7A- e listed as	IN were 70.8 to

<u>236 and 134 mg/Kg. However, the acceptable concentration ranges were listed as 70.8 to</u> <u>129 and 73.2 to 127 mg/Kg, respectively. Actual found concentrations were very close to</u> <u>the listed true values for Cr and Ni. The acceptable recovery ranges for these elements</u> <u>are presumed to be incorrectly listed.</u>

Page 15 of 21

			SERI	AL DILUTION A	NALYSIS		
Seri	al Dilution	performe	d on samples	s107_E004_ (460-23274	8.5 Dilu -13)	ution Factor 4	; 20
San	nple matrix	<b>x:</b>	Soil W	ater	Units:	mg/kg u	ıg/L
ASS	SOCIATED	) (	SAMPLES	AII	SDG	soil	samples
1.	Was a	serial dilut	ion performe	ed at the correct	frequency	?	Yes No
activ	lf			no,			give
uotin							
2.	Was a	field samp	le used for s	erial dilution?			Yes No
	lf			no,			give
acin	лт <u></u>						
3.	For all a	analytes g	reater than to	en times the IDI	after dilut	ion for 6010B	and 25 times
					aon penon	neu.	n/a No
<u>= 83</u>	lf	no,	list	analytes	and	reject	them.
4.	For all a 10 % D r If no, lis	analytes th net? it those ar	nat needed s nalytes outsic	erial dilution and le the limits and	alysis, was I qualify the	the QC limit c n/a No em.	of
5.	Show c	alculation	for % D for c	one analyte ana	lyzed by IC	P.	
	Analyte	Cr	(460-23	391-19)		Lab value _N	C%_
Sam	ple value	:	14.9				
Page	16 of 21					DF	PFSR/BEMQA
						M	ay 2002

Serial Dilution value : 14.7			
	(Sample - Serial Dilution) x 100	1.16	
Serial Dilution % D =	Sample value =	NC	% D
Note: NC = Not Calculated; sample	result <50x MDL (IDL) before dilut	on	

		MET	HOD OF STANDA	RD ADDITION	(MSA)	
ASSO necess	CIATED sary	S	AMPLES	MSA	was	no
1.	If the post was the M	digestion s SA perform	spike recovery for l ned?	Methods 7000/	A was outside the	e QC limit
	lf	no,	explain	and	res No <u>N/A</u> list	action
2. \	Was the M	SA within th	ne linear range of th	e instrument?	Yes No N/A	
	lf	no,	explain	and	list	action
				2		
3. V	 Was the M	SA sample	and spikes analyze	ed consecutively	y? Yes No N/	<u> </u>
3. V	Was the MS	SA sample no,	and spikes analyze explain	ed consecutively and	y? Yes No <u>N/</u> list	A action
3. V 4. V s	Was the Ms	SA sample no, ope of the M irve?	and spikes analyze explain /ISA plot less than 2	ed consecutively and 20% difference	y? Yes No N/ list of the slope of the Yes No	A action
3. V 4. V s	Vas the Ms	SA sample no, ope of the M irve? no,	and spikes analyze explain /ISA plot less than 2 explain	ed consecutively and 20% difference and	y? Yes No N/ list of the slope of the Yes No list	A action

MAY 2002

5. Comments:

SAMPLE RESULT VERIFICATION

ASS sam	SOCIATED	)	SA	MPLES	AII		SDG
1.	Were a	ll sample	results repo	orted within the	calibration range	? Yes	No
	lf	no,	list	affected	samples	and	action.
2.	Was the	e raw dat	a free of any	y anomalies?			Yes No
	If	no,	list	affected	samples	and	action.
3.	Was the	e data pa	ckage free o	of any computat	ional or transcrip	tion errors?	Yes No
	lf	no,	list	affected	samples	and	action.
4.	Was the	e % solid	s analysis p	erformed for all	nonaqueous sam	nples? Yes	No N/A
	lf	no,	list	affected	samples	and	action.
5.	Show th Sample	ne calcula ID: _108	ation for % s 3_B006_3.5	olids for one sa	mple. Lab value	86.3%	
Dry v Net	weight: weight:	4.46 5.17	gm gm % S	<u>Dry w</u> Solids = Wet w	<u>eight</u> x 100 veight	= 86.3	%
6.	Verify t recalcul	hat non ating the	aqueous sa result for or	amples were ne analyte in a s	reported on a sample.	dry weight N//	basis by A
	Sample	_108_B	006_3.5 Ar	nalyteV	Lab value _22.5	mg/Kg_	
Raw	value 0.	09697	mg/L Diluti	on =	4		
Final	l vol	50	mL % Sc	olids =	86.3 mg/L x F	<u>V (ml)</u>	
/vet	wgnt	1.00	gm mg/K	g ary weight =	wet wgt x	x (%Sol/100)	) =   22.5   mg/

Page 20 of 21

Page 21 of 21

14 December, 2012

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

#### Re: <u>PPG – Site 107, Laboratory Job No. 460-34686-1</u>

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						
	<u>Fractions</u> Hexavalent chromium (Cr <sup>+6</sup> ) Total Vanadium (V) pH / Eh ; ORP	Laboratory:	TestAmerica Laboratories, Inc.				
	Report No.: <u>460-34686-1</u>	Matrix:	Non-Aqueous				
Reviewer:	Chris Taylor						

Prepared By: Environmental Quality Associates, Inc.

#### <u>SECTION A</u> 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<sub>4</sub>- / Cr(OH)<sub>3</sub> 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).

## Dresdner-Robin

Mr. Douglas Neumann

14 December, 2012

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

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

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 °C. No sample condition issues were noted in the sample receipt log ; no QA action was necessary.

#### <u>SECTION C</u> <u>Hexavalent Chromium</u>

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.

Dresdner-Robin Mr. Douglas Neumann

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.

## <u>SECTION E</u>

#### **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.

#### <u>SECTION G</u> 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,

Page 4 of 5

EQA, Inc.

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: <u>PPG – Site 107, Laboratory Job No. 460-34781-1</u>

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		
	<u>Fractions</u> Hexavalent chromium (Cr <sup>+6</sup> ) Total Vanadium (V) pH / Eh ; ORP	Laboratory:	TestAmerica Laboratories, Inc.
	Report No.: <u>460-34781-1</u>	Matrix:	Non-Aqueous
Reviewer:	Chris Taylor		

Prepared By: Environmental Quality Associates, Inc.

#### <u>SECTION A</u> 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<sub>4</sub>- / Cr(OH)<sub>3</sub> 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).

Dresdner-Robin

Mr. Douglas Neumann

17 December, 2012

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

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

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 °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, 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, respiked 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.

Dresdner-Robin Mr. Douglas Neumann

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).

#### <u>SECTION E</u> 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:

Prepared By: Environmental Quality Associates, Inc.

#### <u>SECTION A</u> 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<sub>4</sub>- / Cr(OH)<sub>3</sub> 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).

Dresdner-Robin

Mr. Douglas Neumann

18 December, 2012

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	ŝ	12/14/11	х	X
107 MO20E1 1.5	460-00034820-003	ŝ	12/14/11	X	X
107 MO20E1 2.5	460-00034820-004	S	12/14/11	Х	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	Х	X
107 <sup>MO20W</sup> 1.5	460-00034820-010	S	12/14/11	Х	Х
107 <sup>MO20W</sup> 2.5	460-00034820-011	S	12/14/11	Х	Х
107 <sup>MO20W</sup> 3.0	460-00034820-012	S	12/14/11	Х	Х
107 <sup>MO20W</sup> 3.5	460-00034820-013	S	12/14/11	Х	Х
107 <sup>MO20W</sup> 4.0	460-00034820-014	S	12/14/11	Х	Х
108 MO18E2 1.0	460-00034820-015	S	12/14/11	Х	Х
108 MO18E2 3.0	460-00034820-016	S	12/14/11	Х	Х
108 MO18E2 3.5	460-00034820-017	S	12/14/11	Х	Х
108 MO18E2 4.0	460-00034820-018	S	12/14/11	Х	Х
108 MO18E2 4.5	460-00034820-019	S	12/14/11	Х	Х
108 MO18E2 5.0	460-00034820-020	S	12/14/11	Х	Х
REP121411-1	460-00034820-021	S	12/14/11	Х	Х
108_MO18E1_0.5	460-00034820-022	S	12/14/11	Х	Х
108 MO18E1 1.0	460-00034820-023	S	12/14/11	Х	Х
108 MO18E1 3.0	460-00034820-024	S	12/14/11	Х	Х
108_MO18E1_3.5	460-00034820-025	S	12/14/11	Х	Х
108_MO18E1_4.0	460-00034820-026	S	12/14/11		Х
108_MO18E1_4.5	460-00034820-027	S	12/14/11		Х
108_MO18E1_5.0	460-00034820-028	S	12/14/11		Х
REP121411-2	460-00034820-029	S	12/14/11	Х	Х
108_MO18N_1.0	460-00034820-030	S	12/14/11	Х	Х
108_MO18N_1.5	460-00034820-031	S	12/14/11	Х	Х
108_MO18N_2.0	460-00034820-032	S	12/14/11	Х	Х
108_MO18N_3.0	460-00034820-033	S	12/14/11	Х	Х
108_MO18N_3.5	460-00034820-034	S	12/14/11	Х	Х
108_MO18W1_0.5	460-00034820-038	S	12/14/11	Х	Х
108_MO18W1_1.0	460-00034820-039	S	12/14/11	Х	Х
108_MO18W1_1.5	460-00034820-040	S	12/14/11	Х	Х
108_MO18W1_2.5	460-00034820-041	S	12/14/11	Х	Х
108_MO18W1_3.0	460-00034820-042	S	12/14/11	Х	Х
108_MO18W1_3.5	460-00034820-043	S	12/14/11	Х	Х
108_MO18W1_2.0	460-00034820-047	S	12/14/11	Х	Х
REP121411-3	460-00034820-048	S	12/14/11	Х	Х
108_MO18W2_0.5	460-00034820-049	S	12/14/11	Х	Х
108_MO18W2_1.0	460-00034820-050	S	12/14/11	Х	Х
108_MO18W2_3.0	460-00034820-051	S	12/14/11	Х	Х
108_MO18W2_4.0	460-00034820-052	S	12/14/11	Х	Х
108_MO18W2_4.5	460-00034820-053	S	12/14/11		Х
108_MO18W2_5.0	460-00034820-054	S	12/14/11		Х
FB121411-1	460-00034820-055	A	12/14/11	Х	Х
QC Sample	460-00034820-056	S	12/14/11	Х	

S = Non-Aqueous Matrix

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

A = Aqueous Matrix

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Dresdner-Robin Mr. Douglas Neumann

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

#### <u>SECTION C</u> 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 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.

#### <u>SECTION D</u> 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.

Page 3 of 4

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#### <u>SECTION E</u> <u>ReDox Characteristics</u>

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.

#### <u>SECTION G</u> 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

#### HEXCR - 1

# Data Deliverable Requirements - Hexavalent Chromium

-		invironmental
Client Contact :	Douglas Neuman	<u>n</u>
Methodology:	3060 7196	SA
SDG No.:	J34820	
_		
See Above		
F. Non-Conformance Summary ?		Yes No X
G. Methodology Review ?		X
H. Uninitialed Strikeover ?		Х
I. Legible Xerox ?		Х
J. Consistent Dates ?		X
	Client Contact :	Client Contact : Douglas Neuman Methodology: 3060 7196 SDG No.: J34820

#### 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)		Date of	Cr +6	Holding	
Lab ID X		Sample	Analysis	Time	QA
	Matrix	Collection	Date	Exceeded	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	А	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	e QA action t	aken:	
	0			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

1.	Was the instrument properly standardized ? (I.e., Blank + 4 conc. Levels; r <sup>^2</sup> >0.995 ?) If No, explain and list action :	<u>YES</u> N
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         Calculated value =       98.3         ( Lab / True x 100 )	<u>, 01/13/12</u>
6.	Specific comments :	
	Initial calibrations were performed on $12/15/11$ (H $_{2}$ O), and $01/12$ , $01/13,01/19$ and	01/20/12 (soils).

## Calibration Blanks for Hexavalent Chromium

Associated samples : All SDG samples

		YES	<u>N</u>
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 :		

		Prepara fc	ition / Reag or Hexavale	ent Blank Sum nt Chromium	nmary		
Associated sampl Check one	le matrix : ( X )	<u>Soil</u>	Water X	Preparation /	Reagent Blank ID :	<u>MB 460-9604</u>	6/9
	Units :	<u>mg/Kg</u>	ug/L X			Ves	No
Did the frequency of the	preparation /	/ reagent bla	nk analysis	meet method	requirements ?	X	<u>110</u>
lf No, expla	in and note a	ction :				_	
						_	
			< or = MDL	<u> </u>			
CONCENTRA	TION	Yes		No	COMMEN	TS / ACTION	
0		Х					
Associated samples :	460-34820-5	<u>MDL Codes</u> Yes : No : 55	< or = MDL > MDL (FB121411	)			
HEXCR - 5b							
Associated sampl Check one	le matrix : ( X ) Units :	fc <u>Soil</u> X <u>mg/Kg</u> X	or Hexavale <u>Water</u> <u>mg/L</u>	nt Chromium Preparation /	<sup>/</sup> Reagent Blank ID :	MB 460-9855 MB 460-9874 MB 460-9882 MB 460-9877 MB 460-9878 MB 460-9952 MB 460-9953	3/1-A 8/1-A 6/1-A 9/1-A 0/1-A 8/1-A 1/1-A
Did the frequency of the If No, expla	preparation /	/ reagent bla	nk analysis	meet method	requirements ?	Yes X	<u>No</u>
			< or = MDL				
	TION	Yes		No	COMMEN	TS / ACTION	]
		^					
Associated samples .		MDL Codes Yes : No :	< or = MDL > MDL		nciated batch IDs		
Associated sattifies :	Method (pre	ep) blanks for	all batches	s were non-de	tect (ND) for $Cr^{+6}$ .		

Х

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

Matrix :	Non-Aqueous

Units : mg/Kg

Associated samples : <u>All SDG soil samples</u>

		<u>YES</u>	<u>NO</u>
1.	Was the pre-digestion spike analysis performed at the correct frequency ?	X	
	If No, note deviations and action : <u>Spikes were prepared and analyzed</u>		
	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% ?

If No, list action :

Sample ID	Sol.Recov.	Insol.Recov.	Ox / Red ?		
34820-48	66%	93%	0		
re-analysis	69%	86%			
34820-33	25%	45%	0		
re-analysis	10%	47%			
Cas Comments in Item C. halawi					

See Comments in Item 6. below.

#### 5. Show calculation for pre-digestion spike recovery for Cr <sup>+6</sup>

a. Soluble Spike Sample ID: <u>460-342</u>	20-33 b. Insoluble Spike Sample ID: <u>46</u>	<u>60-3420-33</u>
Lab spiked sample value : 13.5	Lab spiked sample value :	391
Lab un-spiked sample value : 1.2	Lab un-spiked sample value :	1.2
Spike added concentration : 48.4	Spike added concentration :	857
Calculated value = 25 % recover ( Spiked - Unspiked ) / Spike Added x 100	very Calculated value = <u>45</u> % 0) (Spiked - Unspiked) / Spike Added	5 recovery x 100)
Lab value : 25 % recover	very Lab value : 45 %	6 recovery
Verified ?yes	Verified ? yes	

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

Environmental Quality Associates, Inc.

#### Post - Verification Spike Analysis ( PVS ) for Hexavalent Chromium

PVS	analysis pe	erformed on sam	ple(s) :	460-3420-33	<u>3</u>		Matrix :	Non-Aqueou	IS
% Solids :	n/a	_			_		Units :	mg/Kg	
Associated	samples :	All SDG soil sa	mples						
								YES	NO
1.	Was the P the proper	VS analysis perf concentration ?	ormed at t (for H <sub>2</sub> O,	he correct free 30 ug/L or 2x s	quency and at sample, w/e is	>)		X	
	(for soil, 40	) mg/Kg or 2x sa	mple, w/e	IS >)					
	If No, note	deviations and a	action :						
2.	Was the P	VS analysis perf	ormed on	a field sample	?			X	
	lf No, quali	fy all associated	samples.						
3. a.	Did the PV	S recovery for C	r +6 meet	the criteria of	85 - 115% ?			Х	
	lf No, list a	ction :							
3. b.	If the % red the aliquot	covery was less ?	than 85%	did the laborat	ory re-spike ar	nd re-analyze		n/a	
	lf No, list a	ction :							
	Did the %	recovery for the	reanalysis	meet the crite	ria of 85 - 115º	% ?		n/a	
	lf No, list a	ction :							
5.	Show calcu	ulation for PVS 9	% recovery	/ for Cr +6.				_	
	Sample ID Lab spiked Lab un-spi Spike adde	: <u>460-3420-33</u> I sample value : ked sample valu ed concentration	e:	43.2 1.20 48.4	-	Sample ID: <u>4</u> Lab spiked s Lab un-spike Spike added	460-34820 ample val d sample concentra	-48 ue : value : tion :	50.6 2.8 48.2
	Calcula ( Spiked	ated value =   - Unspiked ) / S	86.7 pike Adde	% recovery d x 100 )		Calculate ( Spiked -	ed value = Unspiked	99.1 ) / Spike Adde	% recovery d x 100 )
		Lab value :	87	% recovery			Lab value	: 99	% recovery
		Verified ?	yes	_		١	Verified ?	yes	
6.	Specific co	mments :							
	-	-							
		-							

# Duplicate Analysis for Hexavalent Chromium

Duplica	ate analysis performed on sa	mple(s) : <u>460-3420-33</u>		Matrix : <u>N</u>	Ion-Aqueou
				Units : <u>n</u>	ng/Kg
Associate	ed samples : <u>All SDG soil s</u>	amples			
				YES	<u>NO</u>
1.	Was the duplicate analysi	s performed at the correc	ct frequency ?	X	
	If No, note deviations and	action : Duplicate ana	lyses were prepared		
	and analyzed for each dig	estion batch.			
2.	Was the duplicate analysi	s performed on a field sa	mple ?	Х	
	If No, qualify all associate	d samples.			
3.	Did the duplicate results f	or Cr +6 meet the QC co	ntrol limits ?	X	
	( 20% RPD for all Aqueou ( + / - RL for Non-aqueou	us samples & Non-aqueo s samples if either or botl	us >/ = 4x RL) n are < 4x RL)		
	If No, list action :				
	-				
	-			_	
4.	<ul> <li>Show calculation for % R</li> </ul>	PD for Cr+6.			
	Sample ID: 460-3420-33		Sample ID: 160-34820	)-48	
	Lab sample value :	1.2	Lab sample value :	2.8	
	Lab duplicate value :	1.4	Lab duplicate value :	2.8	
	Calculated value =	13.2 % RPD	Calculated value =	0.0	% RPD
	% RPD = <u>Sample - Du</u>	uplicate x 100	% RPD = <u>Sample</u>	- Duplicate	x 100
F					
5.	Specific comments : <u>F</u>	or both samples shown	above, both sample results are b	EIUW 4X KL	
	values; therefore the app	licable precision criterion	is a difference <+/- RL.		
	The difference between s	amples is  < RL value ar	nd meet applicable method criter	ia.	

## Laboratory Control Sample (LCS)

Matrix :	Non-Aqueous			
Units :	mg/Kg			
Associated	I samples : <u>All soil samples.</u>			
			<u>YES</u> <u>NO</u>	
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.			
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 :11.8Lab value :LCS true value :13.0	91	% Recovery	
	LCS ID : <u>98826/2</u> Calculated value =	91	% Recovery	
9	% Recovery = <u>Laboratory LCS result</u> x 100 LCS true value			
5.	Specific comments : <u>All LCS recoveries were within acceptable limits (8</u>	0 - 120%	6).	
Associated	samples : <u>All SDG samples</u>			
------------	--	------------------------	----------------------	---------------------
1.	Were all samples reported within the calibration range?		<u>YES</u>	<u>NO</u>
	If No, list affected samples and action :	- -	X	
2.	Was the raw data free of any anomalies ?	[	Х	
	If No, list affected samples and action :	-		
3.	Was the data package free of any computational or transcription errors ?	-	Х	
	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) If No, list affected samples and action :	-	X	
5.	Were hotplate temperatures provided, and within method requirements ? ( At least 60 minutes, and between 90 to 95 degrees C ) If No, list affected samples and action :	- (	X	
6.	Show the calculation for % Solids for one sample. Sample ID:	- 460-34820-{	50	
	Sample dry weight3.55Lab value :Sample wet weight4.97	71.4	% Solids	
	Calculated % Solids = 71.4	Sample dr Sample we	y weight t weight	x 100
7.	Verify that non-aqueous samples were reported on a dry-weight basis by red Hexavalent Chromium in a sample.	calculating th	e result for	
	Sample result, wet : 0.7639 mg/L	1100	ma/Ka	
	% Solids = <u>71.4</u> % Calculated value =	1114	mg/Kg	
Sample Co	$mc., mg/Kg = \underbrace{\begin{array}{c} curve mg/L & dig.vol, L & dilution \\ 0.76391327 & 0.100 & 25 \\ \hline 0.0024 & 0.714 \\ wetwgt, Kg & %sol/100 \end{array}}_{\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ $	Resu	It verified ?	Yes OK - roundii



**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:

0.5.0				Sample	Perent Semple	Analysis		
SDG	Sample ID		Matrix	Date	Parent Sample	Cr VI	MET	MISC
1070000	FB(20181130)	JC78809-1	Water	11/30/2018		х	Х	х
JC78809	108_M018_C	JC78809-2	Soil	11/30/2018		х	Х	х
	FB(20181204)	JC79067-1	Water	12/4/2018		х	Х	х
JC79067	BS-B6	JC79067-2	Soil	12/4/2018		х	Х	х
	BS-B5	JC79067-3	Soil	12/4/2018		х	Х	х
	FB-A1(20181204)	JC79072-1	Water	12/4/2018		х	Х	х
JC79072	BS-A6T	JC79072-2	Soil	12/4/2018		х	Х	х
	BS-A7	JC79072-3	Soil	12/4/2018		x	х	х
	FB-A1(20181205)	JC79130-1	Water	12/5/2018		х	Х	х
JC79130	BS-A7T	JC79130-2	Soil	12/5/2018		х	Х	х
	BS-A8T	JC79130-3	Soil	12/5/2018		х	Х	х
	FB(20181205)	JC79132-1	Water	12/5/2018		х	Х	х
1070400	BS-B7	JC79132-2	Soil	12/5/2018		х	Х	х
JC79132	BS-B6D	JC79132-3	Soil	12/5/2018		x	х	х
	BS-C6	JC79132-4	Soil	12/5/2018		х	х	х
	FB(20181206)	JC79221-1	Water	12/6/2018		х	Х	х
	BS-C7D	JC79221-2	Soil	12/6/2018		х	Х	х
JC79221	BS-C8D	JC79221-3	Soil	12/6/2018		x	х	х
	BS-C9D	JC79221-4	Soil	12/6/2018		х	х	х
	BS-B8	JC79221-5	Soil	12/6/2018		х	Х	х
	CS-C8 (2)	JC79221-6	Soil	12/6/2018		х	х	х
	BS-B9	JC79221-7	Soil	12/6/2018		х	х	х

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. <u>SDGs #JC79130 and JC79132</u>: 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.

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

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
	Water	180 days from collection to analysis	Preserved to a pH of less than 2; Cool to <6°C
SW-846 6010C	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		orted	Perfor Acce	rmance ptable	Not
	No	Yes	No	Yes	Required
Inductively Coupled Plasma-Atomic Emission Spectromet	ry (ICP-AE	ES)			
Tier II Validation					
Holding Times		x		Х	
Reporting limits (units)		x		Х	
Blanks					
A. Instrument Blanks		x		Х	
B. Method Blanks		x		Х	
C. Equipment/Field Blanks		x		Х	
Laboratory Control Sample (LCS)		x		Х	
Laboratory Control Sample Duplicate (LCSD)		x		Х	
LCS/LCSD Precision (RPD)		x		Х	
Matrix Spike (MS) %R	Х				Х
Matrix Spike Duplicate (MSD) %R	х				Х
MS/MSD Precision (RPD)	х				Х
Field/Lab Duplicate (RPD)	х				Х
ICP Serial Dilution %D	х				Х
Total vs. Dissolved	х				Х
Reporting Limit Verification		x		Х	
Tier III Validation					
Initial Calibration Verification		x		Х	
Continuing Calibration Verification		x		Х	
CRDL Standard Recovery		x		Х	
ICP Interference Check		x		Х	
ICP-MS Internal Standards	х				Х
Transcription/calculations acceptable		Х		Х	
Raw Data	Х				Х
Reporting limits adjusted to reflect sample dilutions		Х		Х	
Notes:					

%R Percent recovery

RPD Relative percent difference

%D Percent difference

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#### 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.

<u>SDGs #JC78809, JC79067, JC79072, and JC79221</u>: 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.

<u>SDGs #JC79130 and JC79132</u>: 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.

<u>SDGs #JC79130 and JC79132</u>: 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 <sup>1</sup>
	Non-detect	UJ-
Spike recovery ≥ 50% but < 75%	Detect	J-
	Non-detect	R
Spike recovery < 50%	Detect	R
Spike recovery > 125%	Non-detect	No Action
Spike recovery > 125% but ≤ 150%	Detect	J+
Spike recovery > 150%	Detect	R

Notes:

<sup>1</sup> 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.

<u>SDGs #JC79130 and JC79132</u>: The original analyses of the field samples are usable with appropriate gualification. 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  $\pm$  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.

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

## DATA VALIDATION CHECKLIST FOR HEXAVALENT CHROMIUM

%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		Analysis: 2 days				
BS-C7D			-			
BS-C8D						
BS-C9D		Analysis: A days				
BS-B8		7 maryolo. 4 dayo				
CS-C8 (2)	SW846 9045D		< 24 hours of receipt by laboratory			
BS-B9						
BS-B6						
BS-B5						
BS-A6T						
BS-A7						
BS-A7T	ASTM D3872-86	Analysis <sup>.</sup> 7 days	< 24 hours from collection			
BS-B7						

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

	Qualification			
Criteria	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.

<u>SDGs #JC79130 and JC79221</u>: 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	Rep	orted	Perfor Accep	mance otable	Not Required
9045D, ASTM D1498-76	No	Yes	No	Yes	Required
Miscellaneous Instrumentation					
Tier II Validation					
Holding times		x	x		
Reporting limits (units)		x		x	
Blanks					
A. Instrument Blanks		x		x	
B. Method blanks		х		Х	
C. Equipment blanks		Х		Х	
Laboratory Control Sample (LCS) %R		Х		Х	
Laboratory Control Sample Duplicate (LCSD) %R	Х				Х
LCS/LCSD Precision (RPD)	Х				Х
Matrix Spike (MS) %R	Х				Х
Matrix Spike Duplicate (MSD) %R	Х				Х
MS/MSD Precision (RPD)	Х				Х
Field/Lab Duplicate (RPD)		Х		Х	
Dilution Factor		Х		х	
Tier III Validation	<u>.</u>				·
Initial calibration %RSD or correlation coefficient	Х				Х
Continuing calibration %R	Х				Х
Raw Data		Х		Х	
Transcription/calculation errors present		x		Х	
Reporting limits adjusted to reflect sample dilutions		x		Х	
Notes:					

%R Percent recovery

RPD Relative percent difference

VALIDATION PERFORMED BY: Jennifer Singer

SIGNATURE:

Annifer Alinger

DATE: May 28, 2019

PEER REVIEW: Dennis Capria

DATE: May 31, 2019

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# CHAIN OF CUSTODY CORRECTED SAMPLE ANALYSIS DATA SHEETS



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npler(s) Name(s) Phone #	Project Manager			Attention:								7 `	1	E 1	0	X	Ś	-				RB	- Rinse Blank
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	Approved by (S	GS Project Manage	er)/Date:		ommercia	I "A" (Le	vel 1)	_		NYAS	SP Cate	gory A											
Std. 10 Business Days			-		Commercia	I "B" ( Lev	vel 2)			NYAS	SP Cate	gory B				CIAL	ACC	M22	ENT	3	3-	w	
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JC78809: Chain of Custody Page 1 of 2

SGS

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#### SGS LabLink@1040243 15:14 21-May-2019

Client Sample ID: Lab Sample ID: Matrix: Project:	FB (20181130) JC78809-1 AQ - Field Blank So PPG Site 107, 18 C	Date Sampled: 11/30/18 Date Received: 11/30/18 Percent Solids: n/a					
General Chemistry		•		<u> </u>			
Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexaval	ent < 0.010	0.010	mg/l	1	11/30/18 21:54	LS	SW846 7196A
<b>Redox Potential Vs H</b>	I2 352		mv	1	12/02/18 14:15	JO	ASTM D1498-76
pH <sup>a</sup>	5.50		su	1	11/30/18 18:45	DG	SM4500H+ B-11

# **Report of Analysis**

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

#### Page 1 of 1



4.1





#### SGS LabLink@1040243 15:14 21-May-2019

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Client Sample ID: Lab Sample ID: Matrix:	108_M01 JC78809- SO - Soil	8_C 2	Date Sampled: 11/30/18 Date Received: 11/30/18 Percent Solids: 81.4							
Project:	PPG Site	107, 18 Ch	apel Avenue,	, Jersey Cit	y, NJ					
General Chemistry										
Analyte		Result	RL	Units	DF	Analyzed	By	Method		
Chromium, Hexava	lent	10.7	0.49	mg/kg	1	12/04/18 13:18	DC	SW846 3060A/7196A		
<b>Redox Potential Vs</b>	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		

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12/02/18 11:50 јо

# **Report of Analysis**

#### Page 1 of 1

SW846 9045D



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		

#### **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 <sup>1</sup>	SW846 3010A <sup>2</sup>
Chromium	< 10	10	ug/l	1	12/03/18	12/03/18 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>
Nickel	< 10	10	ug/l	1	12/03/18	12/03/18 ND	SW846 6010D 1	SW846 3010A <sup>2</sup>
Thallium	< 10	10	ug/l	1	12/03/18	12/03/18 ND	SW846 6010D 1	SW846 3010A <sup>2</sup>
Vanadium	< 50	50	ug/l	1	12/03/18	12/03/18 ND	SW846 6010D 1	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA45759

(2) Prep QC Batch: MP10965



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			•		v			e
Client Sample ID:	FB (2018	1130)						
Lab Sample ID:	JC78809-	1A				Date Sampled	: 11	/30/18
Matrix:	AQ - Fiel	d Blank Soil				Date Received	: 11	/30/18
						Percent Solids	: n/a	a
Project:	PPG Site	107, 18 Chaj	pel Avenue,	Jersey Cit	ty, NJ			
General Chemistry	,							
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivaler	nt <sup>a</sup>	< 0.020	0.020	mg/l	1	12/03/18 17:16	ND	SW846 6010/7196A M

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

Page 1 of 1





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		

#### **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 <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	233	1.3	mg/kg	1	12/03/18	12/03/18 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	12.0	5.0	mg/kg	1	12/03/18	12/03/18 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Thallium	< 1.3	1.3	mg/kg	1	12/03/18	12/03/18 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Vanadium	14.3	6.3	mg/kg	1	12/03/18	12/03/18 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA45758

(2) Prep QC Batch: MP10955



4.2 **4** 



Client Sample ID:	108_M01	8_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 Cha	apel Avenue	, Jersey Cit	y, NJ			
General Chemistry								
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivaler	nt <sup>a</sup>	222	1.8	mg/kg	1	12/04/18 13:18	DC	SW846 6010/7196A M

Page 1 of 1

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





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3 BS-A7			12/4/18	1330	СВ	G	80	1				1			X	Х	X	х	х	х	Х				128
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SGS Post Ex Sample COCs 20181130

JC79067: Chain of Custody Page 1 of 3

Label Verification\_\_\_\_\_



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General Chemistry	y							
General Chemistry	y			Ly, 11J				
Drojost.	DDC Site 107 18 Cl	anal Ayany	a Jarsan Ci	hy NI	Percent Soli	ids: n/a	l	
Lab Sample ID: Matrix:	JC79067-1 AQ - Field Blank Sc	il			Date Sampl Date Receiv	ed: 12/ red: 12/	/04/18 /04/18	
Client Sample ID:	FB(20181204)						10.1.1.0	

Page 1 of 1

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 ЕВ	ASTM D1498-76
pH <sup>a</sup>	5.97		su	1	12/04/18 19:03 SUB	SM4500H+ B-11

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





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

#### **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

#### Page 1 of 1

4.2



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

#### **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

#### Page 1 of 1

4.3



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		

**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 <sup>1</sup>	SW846 3010A <sup>2</sup>
Chromium	< 10	10	ug/l	1	12/05/18	12/07/18 EAL	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>
Nickel	< 10	10	ug/l	1	12/05/18	12/07/18 EAL	SW846 6010D 1	SW846 3010A <sup>2</sup>
Thallium	< 10	10	ug/l	1	12/05/18	12/07/18 EAL	SW846 6010D 1	SW846 3010A <sup>2</sup>
Vanadium	< 50	50	ug/l	1	12/05/18	12/07/18 EAL	SW846 6010D 1	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA45804

(2) Prep QC Batch: MP11069



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Client Sample ID:	FB(20181	204)						
Lab Sample ID:	JC79067-	1A				Date Sampled	: 12/	/04/18
Matrix:	AQ - Fiel	d Blank Soil				Date Received	: 12/	/04/18
						Percent Solids	n/a	ı
Project:	PPG Site	107, 18 Cha	pel Avenue,	Jersey Cit	y, NJ			
General Chemistry								
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivaler	nt <sup>a</sup>	< 0.020	0.020	mg/l	1	12/07/18 15:12	EAL	SW846 6010/7196A M

Page 1 of 1

44

4

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





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 <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	13.1	1.2	mg/kg	1	12/05/18	12/06/18 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	9.5	4.8	mg/kg	1	12/05/18	12/06/18 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Thallium	< 1.2	1.2	mg/kg	1	12/05/18	12/06/18 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Vanadium	9.2	5.9	mg/kg	1	12/05/18	12/06/18 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA45795

(2) Prep QC Batch: MP11070



4.2 4



			Repo	ort of An	alysis			Page 1 of 1
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 Ch	apel Avenue	e, Jersey Cit	y, NJ			
General Chemistry	,							
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivaler	nt <sup>a</sup>	11.9	1.7	mg/kg	1	12/10/18 11:15	DC	SW846 6010/7196A M

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

#### Page 1 of 1

4.2

4



SGS
Client Sample ID:	BS-B5		
Lab Sample ID:	JC79067-3A	Date Sampled:	12/04/18
Matrix:	SO - Soil	Date Received:	12/04/18
		<b>Percent Solids:</b>	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	< 2.5	2.5	mg/kg	1	12/05/18	12/07/18 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	38.5	1.2	mg/kg	1	12/05/18	12/07/18 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	14.4	5.0	mg/kg	1	12/05/18	12/07/18 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>
Thallium	< 1.2	1.2	mg/kg	1	12/05/18	12/07/18 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>
Vanadium	30.3	6.2	mg/kg	1	12/05/18	12/07/18 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA45795

(2) Prep QC Batch: MP11070



4.3 **4** 



Client Sample ID: Lab Sample ID: Matrix: Project:	BS-B5 JC79067- SO - Soil PPG Site	3A 107, 18 Cha	pel Avenue,	Jersey City	y, NJ	Date Sampled Date Received Percent Solids	: 12 : 12 : 82	/04/18 /04/18 .4
General Chemistry								
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivaler	nt <sup>a</sup>	36.6	1.7	mg/kg	1	12/10/18 11:17	DC	SW846 6010/7196A M

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

Page 1 of 1





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formation				32-323-	0200	FAX: 7	32-329-3	1499	3480					SGS Qui	ote #					SGS Job	*		1.	7	2027
formation				w	ww.sgs	.com/e	hsusa																50		1012
	Project Name:		Project	t Informa	ation			_						+				Reques	ted Ar	alysis					Matrix Codes
	PPG Site 10	7 (Jersev Ci	~																						DW - Drinking Wa
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D	18 Chapel A	Avenue		Billing In	formatio	on (If diff	erent from	Repo	rt to)										•						SW - Surface Wa SO - Soil
Zip 18440	City		State	Company	Name																				SL- Studge SED-Sediment
10440	Project #		140	Street Add	dress			_						-					••						OI - Oil LIQ - Other Liqui
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INITIAL ASESSMENT LC 30

SGS Post Ex Sample COCs 20181130

JC79072: Chain of Custody Page 1 of 2



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5.2

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Client Sample ID: Lab Sample ID: Matrix:	FB-A1(20181204) JC79072-1 AQ - Field Blank	) Soil			Date Sample Date Receive	ed: 12/04/18 ed: 12/04/18	
Project:	PPG Site 107, 18	Chapel Avenu	ie, Jersey Ci	ty, NJ	Percent Solie	ds: n/a	
General Chemistry	,						
Analyte	Result	RL	Units	DF	Analyzed	By Method	

Page 1 of 1

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 <sup>a</sup>	5.86		su	1	12/04/18 20:45	SUB	SM4500H+ B-11

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



Client Sample ID:	BS-A6T		
Lab Sample ID:	JC79072-2	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		
Conorol Chamister			

#### **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 <mark>J</mark>		su	1	12/10/18 13:12	EB	SW846 9045D

### Page 1 of 1

4.2



Result

0.54

267

83.5

6.36 J

RL

0.48

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		

Units

mg/kg

mv

%

su

DF

1

1

1

1

Analyzed

### **Report of Analysis**

Page 1 of 1

4.3

#### 12/10/18 13:12 DC SW846 3060A/7196A 12/10/18 13:12 ев ASTM D1498-76M 12/08/18 14:00 RC SM2540 G 18TH ED MOD 12/10/18 13:15 ев SW846 9045D

Method

By

**General Chemistry** 

Chromium, Hexavalent

Redox Potential Vs H2

Solids, Percent

Analyte

pН

RL =	Reporting l	Limit
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#### SGS LabLink@1040243 15:16 21-May-2019

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		

# **Report of Analysis**

#### **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 <sup>1</sup>	SW846 3010A <sup>2</sup>
Chromium	< 10	10	ug/l	1	12/05/18	12/07/18 EAL	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>
Nickel	< 10	10	ug/l	1	12/05/18	12/07/18 EAL	SW846 6010D 1	SW846 3010A <sup>2</sup>
Thallium	< 10	10	ug/l	1	12/05/18	12/07/18 EAL	SW846 6010D 1	SW846 3010A <sup>2</sup>
Vanadium	< 50	50	ug/l	1	12/05/18	12/07/18 EAL	SW846 6010D 1	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA45804

(2) Prep QC Batch: MP11069







Client Sample ID: Lab Sample ID: Matrix: Project:	FB-A1(20 JC79072- AQ - Fiel PPG Site	)181204) 1A d Blank Soil 107, 18 Chaj	pel Avenue,	Jersey Cit	y, NJ	Date Sampled Date Received Percent Solids	: 12/ : 12/ : n/a	/04/18 /04/18 a
General Chemistry	7							
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivaler	nt <sup>a</sup>	< 0.020	0.020	mg/l	1	12/07/18 15:28	EAL	SW846 6010/7196A M

Page 1 of 1

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





Client Sample ID:	BS-A6T		
Lab Sample ID:	JC79072-2A	Date Sampled:	12/04/18
Matrix:	SO - Soil	Date Received:	12/04/18
		<b>Percent Solids:</b>	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 <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	52.3	1.2	mg/kg	1	12/05/18	12/07/18 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	14.1	4.6	mg/kg	1	12/05/18	12/07/18 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>
Thallium	< 1.2	1.2	mg/kg	1	12/05/18	12/07/18 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>
Vanadium	19.2	5.8	mg/kg	1	12/05/18	12/07/18 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA45795

(2) Prep QC Batch: MP11070





Client Sample ID: Lab Sample ID:	BS-A6T JC79072-	2A					Date Sampled	: 12	/04/18
Matrix:	SO - Soil						Date Received	: 12	/04/18
Project:	PPG Site	107, 18 Cł	hapel A	Avenue	, Jersey City	y, NJ	Percent Solids	: 84	.5
General Chemistry	,								
Analyte		Result		RL	Units	DF	Analyzed	By	Method
Chromium, Trivaler	nt <sup>a</sup>	47.3		1.7	mg/kg	1	12/10/18 13:10	DC	SW846 6010/7196A M

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









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 <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	8.7	1.2	mg/kg	1	12/05/18	12/07/18 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	9.4	4.9	mg/kg	1	12/05/18	12/07/18 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>
Thallium	< 1.2	1.2	mg/kg	1	12/05/18	12/07/18 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>
Vanadium	10.7	6.1	mg/kg	1	12/05/18	12/07/18 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA45795

(2) Prep QC Batch: MP11070



4.3 **4** 





Client Sample ID: Lab Sample ID: Matrix: Project:	BS-A7 JC79072- SO - Soil PPG Site	3A 107, 18 Ch	apel Avenue	, Jersey Cit	y, NJ	Date Sampled Date Received Percent Solids	: 12 : 12 : 83	2/04/18 2/04/18 5.5
General Chemistry	,							
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivaler	nt <sup>a</sup>	8.2	1.7	mg/kg	1	12/10/18 13:12	DC	SW846 6010/7196A M

Page 1 of 1

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





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ompan	Client / Reporting Information	Project Name		Projec	t Inform	ation													r	Reque	sted A	nalysia	·	<b>r</b>		Matrix Codes
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lity .	State	Zip City		State	Company	Name														1				1		SL- Sludge
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angie d	Field ID / Point of Collection	MECHIDI Val	Date	Time	by	Comp (C)	Mattix	# of bottles	£	NaC	¥ N	ŝ	NEC	EXC.		8	Ĩ	É	¥	ž	Ĕ	- S				LAB USE ONLY
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2	BS-A7T		12/5/18	1330	GQ	G	so	1				1				x	Х	х	X	х	х	X				
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Ì	Other		Commercial "A" = Results only, Commercial "B" = Results + QC Summery																							
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INITIAL ASESSMENT 3Box

LABEL VERIFICATION

SGS Post Ex Sample COCs 20181130

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JC79130: Chain of Custody Page 1 of 3

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Analyte	Result	RL	Units	DF	Analyzed	By Method	
General Chemistry	<i>y</i>						
Project:	PPG Site 107, 18 Cha	apel Avenue	e, Jersey Ci	ty, NJ			
Matrix:	AQ - Field Blank Soi	1			Date Receiv Percent Soli	ed: 12/05/18 ds: n/a	
Client Sample ID: Lab Sample ID:	FB-A1(20181205) JC79130-1				Date Sample	ed: 12/05/18	

#### < 0.010 0.010 Chromium, Hexavalent 12/05/18 23:05 LS mg/l 1 SW846 7196A Redox Potential Vs H2 390 12/07/18 08:55 RI 1 mv ASTM D1498-76 4.36 1 12/05/18 16:34 SUB SM4500H+ B-11 su

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

pH <sup>a</sup>





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		
Conoral Chamistry			

#### **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

### Page 1 of 1

4.2



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

#### General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	1.8 <b>J</b> -	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

### Page 1 of 1

4.3



SGS LabLink@1040243 15:17 21-May-2019

-

		Repo	rt of An	alysis	Page 1 of 1
Client Sample ID: Lab Sample ID:	BS-A7T JC79130-2R				Date Sampled: 12/05/18
Matrix:	SO - Soil				Date Received: 12/05/18 Percent Solids: 83.6
Project:	PPG Site 107, 18 Cha	apel Avenue	Jersey Cit	y, NJ	
General Chemistr	У				
Analyte	Result	RL	Units	DF	Analyzed By Method
Chromium, Hexav	alent 1.9	0.48	mg/kg	1	12/11/18 11:34 DC SW846 3060A/7196A



Iron, Ferrous

Sulfide Screen

Total Organic Carbon

0.37 J

317

NEGATIVE

Analyte	Result	RL	Units	DF	Analyzed	By	Method	
General Chemistr	y							
Project:	PPG Site 107, 18 Cha	pel Avenue	e, Jersey Cit	ty, NJ				
Matrix:	SO - Soil				Date Receiv Percent Soli	red: 12 ids: 83	2/05/18 3.6	
Client Sample ID: Lab Sample ID:	BS-A7T JC79130-2RT				Date Sampl	<b>ed:</b> 12	2/05/18	

### **Report of Analysis**

#### Page 1 of 1

ASTM D3872-86

SM4500S2- A-11

LLOYD KAHN 1988 MOD

MP

12/12/18 12:00 ST

12/12/18 18:54 јо

12/12/18

4.2

%

mg/kg

1

1

1

0.20





		Repo	rt of An	alysis		Page 1 of 1
Client Sample ID:	BS-A8T					
Lab Sample ID:	JC79130-3R				<b>Date Sampled:</b> 12/05/18	
Matrix:	SO - Soil				<b>Date Received:</b> 12/05/18	
					Percent Solids: 84.9	
Project:	PPG Site 107, 18 Cha	pel Avenue	, Jersey Cit	y, NJ		
General Chemistry	y					
Analyte	Result	RL	Units	DF	Analyzed By Method	d
Chromium, Hexava	alent 2.7	0.47	mg/kg	1	12/11/18 11:36 DC SW846 3	.060A/7196A



4.3

#### SGS LabLink@1040243 15:16 21-May-2019

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
		<b>Percent Solids:</b>	n/a
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

# **Report of Analysis**

#### **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 <sup>1</sup>	SW846 3010A <sup>2</sup>
Chromium	< 10	10	ug/l	1	12/06/18	12/07/18 ND	SW846 6010D 1	SW846 3010A <sup>2</sup>
Nickel	< 10	10	ug/l	1	12/06/18	12/07/18 ND	SW846 6010D 1	SW846 3010A <sup>2</sup>
Thallium	< 10	10	ug/l	1	12/06/18	12/07/18 ND	SW846 6010D 1	SW846 3010A <sup>2</sup>
Vanadium	< 50	50	ug/l	1	12/06/18	12/07/18 ND	SW846 6010D 1	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA45795

(2) Prep QC Batch: MP11083



4

4

8 of 232

JC79130A

Client Sample ID: Lab Sample ID: Matrix: Project:	FB-A1(20 JC79130- AQ - Fiel PPG Site	)181205) 1A d Blank Soil 107, 18 Chaj	pel Avenue,	Jersey Cit	y, NJ	Date Sampled: Date Received Percent Solids	: 12 : 12 : n/s	2/05/18 2/05/18 a
General Chemistry	,							
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivaler	nt <sup>a</sup>	< 0.020	0.020	mg/l	1	12/07/18 07:12	ND	SW846 6010/7196A M

Page 1 of 1

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





Client Sample ID:	BS-A7T		
Lab Sample ID:	JC79130-2A	Date Sampled:	12/05/18
Matrix:	SO - Soil	Date Received:	12/05/18
		<b>Percent Solids:</b>	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	< 2.4	2.4	mg/kg	1	12/06/18	12/07/18 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	33.3	1.2	mg/kg	1	12/06/18	12/07/18 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	11.4	4.7	mg/kg	1	12/06/18	12/07/18 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>
Thallium	< 1.2	1.2	mg/kg	1	12/06/18	12/07/18 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>
Vanadium	11.4	5.9	mg/kg	1	12/06/18	12/07/18 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA45795

(2) Prep QC Batch: MP11078





								-	
Client Sample ID:	BS-A7T								
Lab Sample ID:	JC79130-	2A				Date Sampled	: 12	2/05/18	
Matrix:	SO - Soil	SO - Soil Date Received: 12/05/18							
						Percent Solids	: 83	6.6	
Project:	PPG Site	107, 18 Ch	apel Avenue	, Jersey Cit	y, NJ				
General Chemistry	,								
Analyte		Result	RL	Units	DF	Analyzed	By	Method	
Chromium, Trivale	nt <sup>a</sup>	29.8	1.7	mg/kg	1	12/07/18 12:48	DC	SW846 6010/7196A M	

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







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 <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	279	1.2	mg/kg	1	12/06/18	12/07/18 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	7.3	4.9	mg/kg	1	12/06/18	12/07/18 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>
Thallium	< 1.2	1.2	mg/kg	1	12/06/18	12/07/18 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>
Vanadium	20.4	6.1	mg/kg	1	12/06/18	12/07/18 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA45795

(2) Prep QC Batch: MP11078

RL = Reporting Limit





			Repor	rt of An	alysis			Page 1 of 1
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 Cha	pel Avenue,	Jersey Cit	y, NJ			
General Chemistry	,							
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivaler	nt <sup>a</sup>	277	1.7	mg/kg	1	12/07/18 12:50	DC	SW846 6010/7196A M

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

#### Page 1 of 1

4.3



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INITIAL ASESSMENT 3B JK

LABEL VERIFICATION

SGS Post Ex Sample COCs 20181130

JC79132: Chain of Custody Page 1 of 3





5.2

S

Chromium, Hexavalent

Redox Potential Vs H2

pH <sup>a</sup>

Analvte	Result	RL	Units	DF	Analyzed	Bv Method	
General Chemistr	y						
Project:	PPG Site 107, 18 Ch	apel Avenue	e, Jersey Ci	ty, NJ			
Matrix:	AQ - Field Blank Soi	1			Date Receiv Percent Sol	ved: 12/05/18 ids: n/a	
Client Sample ID: Lab Sample ID:	FB(20181205) JC79132-1				Date Sampl	ed: 12/05/18	

mg/l

mv

su

1

1

1

12/05/18 23:05 LS

12/07/18 09:03 RI

12/05/18 16:21 SUB SM4500H+ B-11

0.010

### **Report of Analysis**

Page 1 of 1

SW846 7196A

ASTM D1498-76

4.1 **4** 

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

< 0.010

403



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

### Page 1 of 1

4.2



Client Sample ID:	BS-B6D		
Lab Sample ID:	JC79132-3	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		
C			

#### **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

### Page 1 of 1

4.3



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

### Page 1 of 1



SGS LabLink@1040243 15:18 21-May-2019

		Repo	rt of An	alysis		Page 1 of	1
Client Sample ID:	BS-B7						
Lab Sample ID:	JC79132-2R				Date Sampled:	12/05/18	
Matrix:	SO - Soil				Date Received:	12/05/18	
		<u> </u>			<b>Percent Solids:</b>	82.9	
Project:	PPG Site 107, 18 Cl	hapel Avenue	, Jersey Cit	y, NJ			
General Chemistr	y						
Analyte	Result	RL	Units	DF	Analyzed B	y Method	
Chromium, Hexava	alent 1.1	0.48	mg/kg	1	12/11/18 12:45 D	C SW846 3060A/7196A	۱.



0.57 J

878

NEGATIVE

0.20

120

Iron, Ferrous

Sulfide Screen

Total Organic Carbon

Analyte	Result	RL	Units	DF	Analyzed	By	Method	
General Chemistr	У							
Project:	PPG Site 107, 18 Cha	pel Avenue	e, Jersey Cit	ty, NJ				
Matrix:	SO - Soil				Date Receiv Percent Soli	r <b>ed:</b> 12 ids: 82	2/05/18 2.9	
Client Sample ID: Lab Sample ID:	BS-B7 JC79132-2RT				Date Sampl	<b>ed:</b> 12	2/05/18	

%

mg/kg

1

1

1

### **Report of Analysis**

#### Page 1 of 1

ASTM D3872-86 SM4500S2- A-11 LLOYD KAHN 1988 MOD

12/12/18 12:00 ST

12/12/18 19:36 јо

MP

12/12/18





SGS LabLink@1040243	15:18 21-May-2019
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		Repo	rt of An	alysis	Page 1 of 1
Client Sample ID:	BS-B6D				
Lab Sample ID:	JC79132-3R				<b>Date Sampled:</b> 12/05/18
Matrix:	SO - Soil				<b>Date Received:</b> 12/05/18
					Percent Solids: 83.0
Project:	PPG Site 107, 18 0	Chapel Avenue	Jersey Cit	y, NJ	
General Chemistry	,				
Analyte	Result	RL	Units	DF	Analyzed By Method
Chromium, Hexava	lent 2.6	0.48	mg/kg	1	12/11/18 12:47 DC SW84 <del>5 3060</del> A/7196A



		Repo	rt of An	alysis	Page 1 of 1	
Client Sample ID: BS-C	6					]
Lab Sample ID: JC79	132-4R				<b>Date Sampled:</b> 12/05/18	
Matrix: SO -	Soil				<b>Date Received:</b> 12/05/18	
		_			Percent Solids: 83.5	1
Project: PPG	Site 107, 18 Cha	pel Avenue	, Jersey Cit	y, NJ		
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	



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		

**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 <sup>1</sup>	SW846 3010A <sup>2</sup>
Chromium	< 10	10	ug/l	1	12/06/18	12/07/18 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>
Nickel	< 10	10	ug/l	1	12/06/18	12/07/18 ND	SW846 6010D 1	SW846 3010A <sup>2</sup>
Thallium	< 10	10	ug/l	1	12/06/18	12/07/18 ND	SW846 6010D 1	SW846 3010A <sup>2</sup>
Vanadium	< 50	50	ug/l	1	12/06/18	12/07/18 ND	SW846 6010D 1	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA45795

(2) Prep QC Batch: MP11083



44

4

8 of 235

JC79132A

			_		-			
Client Sample ID:	FB(20181	205)						
Lab Sample ID:	JC79132-	1A				Date Sampled	: 12	/05/18
Matrix:	AQ - Fiel	d Blank Soil				Date Received	: 12	/05/18
						Percent Solids	: n/a	a
Project:	PPG Site	107, 18 Chaj	pel Avenue,	Jersey Cit	y, NJ			
General Chemistry	7							
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivaler	nt <sup>a</sup>	< 0.020	0.020	mg/l	1	12/07/18 07:17	ND	SW846 6010/7196A M

Page 1 of 1

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




Client Sample ID:	BS-B7		
Lab Sample ID:	JC79132-2A	Date Sampled:	12/05/18
Matrix:	SO - Soil	Date Received:	12/05/18
		<b>Percent Solids:</b>	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	12/06/18	12/07/18 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	12.9	1.2	mg/kg	1	12/06/18	12/07/18 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	10.9	4.7	mg/kg	1	12/06/18	12/07/18 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>
Thallium	< 1.2	1.2	mg/kg	1	12/06/18	12/07/18 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>
Vanadium	15.6	5.9	mg/kg	1	12/06/18	12/07/18 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA45795

(2) Prep QC Batch: MP11078



4.2 **4** 



Client Sample ID: Lab Sample ID: Matrix: Project:	BS-B7 JC79132- SO - Soil PPG Site	2A 107, 18 Cha	apel Avenue	, Jersey Cit	y, NJ	Date Sampled Date Received Percent Solids	: 12 : 12 : 82	/05/18 /05/18 .9
General Chemistry	,							1
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivaler	nt <sup>a</sup>	11.9	1.7	mg/kg	1	12/07/18 13:57	DC	SW846 6010/7196A M

Page 1 of 1





Client Sample ID:	BS-B6D		
Lab Sample ID:	JC79132-3A	Date Sampled:	12/05/18
Matrix:	SO - Soil	Date Received:	12/05/18
		<b>Percent Solids:</b>	83.0
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	12/06/18	12/07/18 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	23.5	1.2	mg/kg	1	12/06/18	12/07/18 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	8.0	4.8	mg/kg	1	12/06/18	12/07/18 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Thallium	< 1.2	1.2	mg/kg	1	12/06/18	12/07/18 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Vanadium	14.5	6.0	mg/kg	1	12/06/18	12/07/18 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA45795

(2) Prep QC Batch: MP11078



4.3 4



SGS

Client Sample ID: Lab Sample ID: Matrix: Project:	BS-B6D JC79132- SO - Soil PPG Site	3A 107, 18 Cha	pel Avenue,	Jersey City	y, NJ	Date Sampled Date Received Percent Solids	: 12 : 12 : 83	/05/18 /05/18 .0
General Chemistry	,							
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivaler	nt <sup>a</sup>	21.1	1.7	mg/kg	1	12/07/18 13:59	DC	SW846 6010/7196A M

Page 1 of 1

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



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 <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	37.6	1.2	mg/kg	1	12/06/18	12/07/18 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	10.6	4.9	mg/kg	1	12/06/18	12/07/18 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Thallium	< 1.2	1.2	mg/kg	1	12/06/18	12/07/18 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Vanadium	18.9	6.1	mg/kg	1	12/06/18	12/07/18 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA45795

(2) Prep QC Batch: MP11078



4.4 **4** 

14 of 235

JC79132A

Client Sample ID: Lab Sample ID: Matrix:	BS-C6 JC79132- SO - Soil	4A	anal Avanua	Jarcov Cit	v NI	Date Sampled Date Received Percent Solids	: 12 : 12 : 83	//05/18 //05/18 /.5
General Chemistry		107, 18 Cha		, Jersey Ch	y, INJ			]
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivaler	nt <sup>a</sup>	32.5	1.7	mg/kg	1	12/07/18 13:59	DC	SW846 6010/7196A M

Page 1 of 1



SGS	SP FB		CHAI SGS 2235	N OF S North Ame Route 130,	erica Inc Dayton	JST( - Dayto	<b>DD</b>	Y				FED-EX	Tracking	) <del>11</del>				Bottie C		GE	<b>c</b>	DF _/_	E
•			TEL. 73	2-329-0200 www.sgs.	Com/ehs	732-329 usa	-3499					SGS Qu	ote #					SGS Jo	b#	TC7	9221		
Client / Reporting Information			Project	Informatio	on .	4. 1991 4. 1991	1			14915			Req	uester	I Anal	ysis (	see Ti	ST C	ODE	sheet)		Matrix Coo	des
Company Name Arcadis	Project Name:	PPG	Jein	ey Ci	ty.	Site	10	17					Ę									GW - Drinking GW - Ground	Water Water
Street Address 10 Friends Lanc City State Zip	Street 18 City	Chapel	Ave	Billing Info	ermation ( ame	if differen	nt from I	Report	to)			5	1 WO									SW - Surface SO - Soil SL- Sludg	Water il ge
Newtown PA 18440	Jerse	2 Ghz	NJ									E S	9		Ę							SED-Sedim OI - Oil	ient
Project Contact E-mail	Project #	PD. 6001.0	0005	Street Addre	955							4			5							LIQ - Other Li AIR - Air	.iquid
Phone # Fax #	Client Purchase	Order #		City			St	ate		Zip			1 5		10			2				SOL - Other S WP - Wip	Solid
640, 762.3629 Sampler(s) Name(s) Phone #	Project Manage	r		Attention:								i i	1	1	14	5	Ę	3		-		EB-Equipment BB- Rinse Bi	ank Blank
Christin C. Felli 201.244.8065	Jim M	Aclaughlin										1 4	2	. 2	2	le"	10	ad				TB-Trip Bla	ank
Lab Sample # Field ID / Point of Collection	MEOH/DI Vial #	Collec	Time	Sampled by	Matrix	# of	ICI BOH	Number	ONE 2SO4	If Water IEOH	NCORE	1.1	¥ X	Anb	TOFAI	Nic	Thel	Var				LAB USE O	
$\frac{1}{1} = \frac{FR(20)R(20)}{FR(20)}$		12/10/10	10.45	Campica by	10	11	1 Z	2	2	<u> </u>		X	x	X	X	X	X	V				A	27
I POGI (PB)		12/0/10	1291	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	FD	4	++	-	1	++		X	X	×	X	X	X	Â				- 00	-6-
2 85-170		17/6 119	1100	11	50		H	Ħ	1	T	T	Ý	X	X	X	X	X	X	-		-	- 42	2
3 BS CRN		1440	1300	((	CO CO		++	++		++	+-	X	X	X	X	X	Ŷ	X			_	(3	8
V RS-C9N		11/10	1200	10	50		+	++	-tit		+	X	Ŷ	Ϋ́	X	X	Ŷ	X	-				~
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6 (5-68		12/6/18	1415	CC	50	)		++	11		+	Ø	X	X	X	X	Ý	Ý					-
7 10001		12/6/14	310	12	50	1		$\top$	Tí l			×	X	X	X	×	Ý	×	1				
					<u> </u>		Ħ	$^{\dagger\dagger}$		11		A.	-			-		1 st					
							$\square$	$^{\dagger \dagger}$															
							H	T															
Turnaround Time ( Business days)	10	1- (j				Data	Delive	erable	Informa	tion				19.18			Com	ments	/ Speci	ial Instru	tions	and a second	204
Std. 10 Business Days	Approved by (S	GS Project Manage	r)/Date:		ommercia ommercia	il "A" (Lev il "B" (Lev	vel 1) vel 2)		H	NYASP	Categ	lory A lory B										*	
5 Day RUSH				E FL	ULLT1 (L	evel 3+4 )				State F	orms	E.,									2A		
3 Day RUSH			-		J Reduce ommercia	1 1 "C"			R	EDD Fo	ormat	Equ	<b></b>				ITIA	AS	ESSA	ENT_	2713	k	
1 Day RUSH					NJ Data	of Knowr	n Qualit	ly Prot	ocol Rej	porting						L	ABEL	VER	IFIC	ATION			
Emergency & Rush T/A data available via Labilish			-	Commercial	"A" = Res	ults Only;	Com	mercial	"B" = Ri	esults + (	QC Su	mmary		Sam	ole inv	/entor	v is v	erified	lupor	receir	t in the I	aboratory	
Emergency & RUSH 1/A data available via Labulhk	5	Sample Custody r	nust be docu	imented bej	ow each	time sar	nples o	chang	e poss	ession,	inclu	ding co	ourier o	deliver	/.		- 10 V		apor	A		, acordiory	
Relinituisted by Sampler Date Time; 1 9 7 12/1/1	g 1440	1 SCh	m~ 1	16/1	CQ	30	Relinqu 2	uished	X	hn	/	26	118		15	ŻŹ		Receiv 2	ed By:	Z	_		
Relinquished by Sampler: Date Time: 3		Received By: 3	- /	77			Relinqu 4	uished I	By:			,	0		Date Tir	ne:		Receiv 4	ed By:	~.		~	
Relinquished by: Date Time:		Received By:					Custod	iy Seal i	6.06			Intact Not inta	act	Preserv	ed wher	e applica	able				Co	oler Temp.	
5		15						16															
5		5						16	004													OH	

JC79221: Chain of Custody Page 1 of 4

SGS

5.2

G

Chromium, Hexavalent

Redox Potential Vs H2

pH <sup>a</sup>

General Chemistry	y						
Project:	PPG Site 107, 18 Ch	apel Avenu	e, Jersey Ci	ty, NJ	Percent Sol	ids: n/a	
Client Sample ID: Lab Sample ID: Matrix:	FB(20181206) JC79221-1 AQ - Field Blank So	il			Date Sampl Date Receiv	ed: 12/06/18 red: 12/06/18	

mg/l

mv

su

1

1

1

12/06/18 21:55 LS

12/10/18 11:57 ев

12/06/18 16:06 SUB SM4500H+ B-11

0.010

## **Report of Analysis**

Page 1 of 1

SW846 7196A

ASTM D1498-76

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

< 0.010

258

5.22



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

## Page 1 of 1

4.2



Client Sample ID:	BS-C8D		
Lab Sample ID:	JC79221-3	Date Sampled:	12/06/18
Matrix:	SO - Soil	Date Received:	12/06/18
		<b>Percent Solids:</b>	80.8
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		
Conorol Chamister			

#### **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 <mark>J</mark>		su	1	12/10/18 12:34	EB	SW846 9045D

## Page 1 of 1

4.3



Client Sample ID:	BS-C9D		
Lab Sample ID:	JC79221-4	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, 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

## Page 1 of 1

4.4 **4** 



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

## Page 1 of 1

4.5



Lab Sample ID:	JC79221-6	Date Sampled:	12/06/18	
Matrix:	SO - Soil	Date Received:	12/06/18	
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	Percent Solids:	85.5	
Client Sample ID:	CS-C8 (2)	Data Samulad:	12/06/18	

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

## Page 1 of 1

4.6



Client Sample ID:	BS-B9		
Lab Sample ID:	JC79221-7	Date Sampled:	12/06/18
Matrix:	SO - Soil	Date Received:	12/06/18
		<b>Percent Solids:</b>	75.9
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		
a			,

#### **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

## Page 1 of 1

4.7



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		

**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 <sup>2</sup>	SW846 3010A <sup>3</sup>
Chromium	< 10	10	ug/l	1	12/06/18	12/07/18 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>3</sup>
Nickel	< 10	10	ug/l	1	12/06/18	12/07/18 ND	SW846 6010D 1	SW846 3010A <sup>3</sup>
Thallium	< 10	10	ug/l	1	12/06/18	12/07/18 ND	SW846 6010D 1	SW846 3010A <sup>3</sup>
Vanadium	< 50	50	ug/l	1	12/06/18	12/07/18 ND	SW846 6010D 1	SW846 3010A <sup>3</sup>

(1) Instrument QC Batch: MA45805

(2) Instrument QC Batch: MA45821

(3) Prep QC Batch: MP11122







Client Sample ID:	FB(2018)	206)							
Lab Sample ID:	JC79221-	1A			<b>Date Sampled:</b> 12/06/18				
Matrix:	AQ - Field Blank Soil Date Received: 12/06/18								
						Percent Solids	: n/a	a	
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ								
General Chemistry									
Analyte		Result	RL	Units	DF	Analyzed	By	Method	
Chromium, Trivaler	nt <sup>a</sup>	< 0.020	0.020	mg/l	1	12/07/18 18:10	ND	SW846 6010/7196A M	







Client Sample ID:	BS-C7D		
Lab Sample ID:	JC79221-2A	Date Sampled:	12/06/18
Matrix:	SO - Soil	Date Received:	12/06/18
		<b>Percent Solids:</b>	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 <sup>2</sup>
Chromium	17.9	1.2	mg/kg	1	12/07/18	12/07/18 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	12.1	4.7	mg/kg	1	12/07/18	12/07/18 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>
Thallium	< 1.2	1.2	mg/kg	1	12/07/18	12/07/18 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>
Vanadium	16.8	5.9	mg/kg	1	12/07/18	12/07/18 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA45805

(2) Prep QC Batch: MP11125



4.2 4



			-		2			_	
Client Sample ID:	BS-C7D								
Lab Sample ID:	JC79221-	2A				Date Sampled	: 12	2/06/18	
Matrix:	SO - Soil					<b>Date Received:</b> 12/06/18			
						Percent Solids	: 82	2.8	
Project:	PPG Site	107, 18 Ch	apel Avenue	, Jersey Cit	y, NJ				
General Chemistry	,								
Analyte		Result	RL	Units	DF	Analyzed	By	Method	
Chromium, Trivale	nt <sup>a</sup>	16.7	1.7	mg/kg	1	12/10/18 12:12	DC	SW846 6010/7196A M	







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 <sup>a</sup>	< 4.9	4.9	mg/kg	2	12/07/18	12/07/18 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	92.3	1.2	mg/kg	1	12/07/18	12/07/18 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>
Nickel	14.5	4.9	mg/kg	1	12/07/18	12/07/18 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>
Thallium <sup>a</sup>	< 2.4	2.4	mg/kg	2	12/07/18	12/07/18 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>
Vanadium	35.1	6.1	mg/kg	1	12/07/18	12/07/18 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA45805

(2) Prep QC Batch: MP11125

(a) Elevated detection limit due to dilution required for high interfering element.







			Repor	rt of An	alysis			Page 1 of 1
Client Sample ID:	BS-C8D							
Lab Sample ID:	JC79221-	3A				Date Sampled:	12	/06/18
Matrix:	SO - Soil					<b>Date Received</b>	: 12	/06/18
						Percent Solids	: 80	.8
Project:	PPG Site	107, 18 Cha	pel Avenue,	Jersey City	y, NJ			
General Chemistry	,							
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivaler	nt <sup>a</sup>	90.9	1.7	mg/kg	1	12/10/18 12:17	DC	SW846 6010/7196A M

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

## Page 1 of 1

4.3 4



Client Sample ID:	BS-C9D		
Lab Sample ID:	JC79221-4A	Date Sampled:	12/06/18
Matrix:	SO - Soil	Date Received:	12/06/18
		<b>Percent Solids:</b>	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 <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	11.7	1.3	mg/kg	1	12/07/18	12/07/18 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	14.6	5.1	mg/kg	1	12/07/18	12/07/18 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Thallium	< 1.3	1.3	mg/kg	1	12/07/18	12/07/18 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Vanadium	17.6	6.3	mg/kg	1	12/07/18	12/07/18 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA45805

(2) Prep QC Batch: MP11125



4.4 **4** 



			_		-				
Client Sample ID:	BS-C9D								
Lab Sample ID:	JC79221-	4A				Date Sampled	: 12	/06/18	
Matrix:	SO - Soil					<b>Date Received:</b> 12/06/18			
						Percent Solids	: 81	.5	
Project:	PPG Site	107, 18 Ch	apel Avenue	, Jersey Cit	y, NJ				
General Chemistry								,	
Analyte		Result	RL	Units	DF	Analyzed	By	Method	
Chromium, Trivale	nt <sup>a</sup>	10.7	1.8	mg/kg	1	12/10/18 12:17	DC	SW846 6010/7196A M	







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		

**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 <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	14.4	1.2	mg/kg	1	12/07/18	12/07/18 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	8.5	4.9	mg/kg	1	12/07/18	12/07/18 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Thallium	< 1.2	1.2	mg/kg	1	12/07/18	12/07/18 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Vanadium	24.5	6.1	mg/kg	1	12/07/18	12/07/18 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA45805

(2) Prep QC Batch: MP11125



4.5 **4** 



Client Sample ID: Lab Sample ID: Matrix: Project:	BS-B8 JC79221- SO - Soil PPG Site	BS-B8 JC79221-5A SO - Soil PPG Site 107, 18 Chapel Avenue, Jersey City, NJ Date Sampled: 12/06/18 Date Received: 12/06/18 Percent Solids: 84.1							
General Chemistry									
Analyte		Result	RL	Units	DF	Analyzed	By	Method	
Chromium, Trivaler	nt <sup>a</sup>	13.5	1.7	mg/kg	1	12/10/18 12:17	DC	SW846 6010/7196A M	

Page 1 of 1





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		

**Metals Analysis** 

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Antimony <sup>a</sup>	< 4.6	4.6	mg/kg	2	12/07/18	12/07/18 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>
Chromium	12.1	1.2	mg/kg	1	12/07/18	12/07/18 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	9.6	4.6	mg/kg	1	12/07/18	12/07/18 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>
Thallium <sup>a</sup>	< 5.8	5.8	mg/kg	5	12/07/18	12/07/18 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>
Vanadium	16.5	5.8	mg/kg	1	12/07/18	12/07/18 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA45805

(2) Prep QC Batch: MP11125

(a) Elevated detection limit due to dilution required for high interfering element.

Page 1 of 1





<b>F</b>									
Client Sample ID:	CS-C8 (2	)							
Lab Sample ID:	JC79221-	6A				Date Sampled	: 12	/06/18	
Matrix:	SO - Soil					<b>Date Received:</b> 12/06/18			
						Percent Solids	: 85	.5	
Project:	PPG Site	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ							
General Chemistry									
Analyte		Result	RL	Units	DF	Analyzed	By	Method	
Chromium, Trivale	nt <sup>a</sup>	12.1	1.7	mg/kg	1	12/10/18 12:17	DC	SW846 6010/7196A M	

Page 1 of 1





Client Sample ID:	BS-B9		
Lab Sample ID:	JC79221-7A	Date Sampled:	12/06/18
Matrix:	SO - Soil	Date Received:	12/06/18
		<b>Percent Solids:</b>	75.9
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	12/07/18	12/07/18 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	12.7	1.3	mg/kg	1	12/07/18	12/07/18 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	9.2	5.3	mg/kg	1	12/07/18	12/07/18 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>
Thallium	< 1.3	1.3	mg/kg	1	12/07/18	12/07/18 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>
Vanadium	16.3	6.6	mg/kg	1	12/07/18	12/07/18 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA45805

(2) Prep QC Batch: MP11125



4.7 4



Client Sample ID: Lab Sample ID: Matrix: Project:	BS-B9 JC79221- SO - Soil PPG Site	BS-B9 JC79221-7A SO - Soil PPG Site 107, 18 Chapel Avenue, Jersey City, NJ Date Sampled: 12/06/18 Date Received: 12/06/18 Percent Solids: 75.9							
General Chemistry									
Analyte		Result	RL	Units	DF	Analyzed	By	Method	
Chromium, Trivaler	nt <sup>a</sup>	11.7	1.8	mg/kg	1	12/10/18 12:17	DC	SW846 6010/7196A M	

Page 1 of 1







**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:

				Sample		Analysis			
SDG	Sample ID	Lab ID	Matrix	Collection Date	Parent Sample	Cr VI	MET	MISC	
1000505	FB(20181228)	JC80585-1	Water	12/28/2018		х	Х	х	
JC80585	BS-114	JC80585-2	Soil	12/28/2018		х	х	х	
	FB(20190109)	JC81057-1	Water	1/9/2019		х	Х	х	
	SW-A0(0.0-0.5)	JC81057-2	Soil	1/9/2019		х	Х	х	
1001057	SW-A0(2.0-2.5)	JC81057-3	Soil	1/9/2019		х	Х	х	
JC81057	SW-A0(4.0-4.5)	JC81057-4	Soil	1/9/2019		х	х	х	
	SW-A0(6.0-6.5)	JC81057-5	Soil	1/9/2019		х	х	х	
	SW-A0(6.5-7.0)	JC81057-6	Soil	1/9/2019		х	Х	х	
	FB(20190108)	JC81058-1	Water	1/8/2019		х	Х	х	
JC81058	BS-A5	JC81058-2	Soil	1/8/2019		х	х	х	
	107_M020N	JC81058-3	Soil	1/8/2019		х	Х	х	
	FB(20190110)-A1	JC81147-1	Water	1/10/2019		Х	Х	х	
	BS-A8	JC81147-2	Soil	1/10/2019		x	х	х	
JC81147	BS-A9	JC81147-3	Soil	1/10/2019		х	Х	х	
	BS-A9U	JC81147-4	Soil	1/10/2019		х	Х	х	
	DUP-1RR(20190110)	JC81147-5	Soil	1/10/2019	BS-A8	х	х	х	
	FB(20190111)-A1	JC81225-1	Water	1/11/2019		х	Х	х	
	BS-A10	JC81225-2	Soil	1/11/2019		х	х	х	
JC81225	BS-A11	JC81225-3	Soil	1/11/2019		х	Х	х	
	BS-A12	JC81225-4	Soil	1/11/2019		х	Х	х	
	BS-A12S	JC81225-5	Soil	1/11/2019		Х	Х	х	

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.

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#### DATA REVIEW REPORT

- 3. Miscellaneous parameters include pH and redox potential.
- <u>SDGs #JC81057, JC81147, and JC81225</u>: 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.

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

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.

#### DATA REVIEW REPORT

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
	Water	180 days from collection to analysis	Preserved to a pH of less than 2; Cool to <6°C
SW-846 6010C	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).

#### DATA REVIEW REPORT

## 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.

<u>SDG #JC81147</u>: 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
	Non-detect	UJ-
MS/MSD percent recovery 30% to 74%	Detect	J-
	Non-detect	R
MS/MSD percent recovery < 30%	Detect	J-
	Non-detect	No Action
MS/MSD percent recovery > 125%	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.

<u>SDG #JC81147</u>: 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.

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	
	Vanadium	17.9	18.2	AC

Results for duplicate samples are summarized in the following table.

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.

<u>SDG #JC81147</u>: 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
	Non-detect	UJ
> 10%	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		orted	Performance Acceptable		Not
	No	Yes	No	Yes	Required
Inductively Coupled Plasma-Atomic Emission Spectromet	ry (ICP-AE	S)			
Tier II Validation					
Holding Times		x		x	
Reporting limits (units)		x		х	
Blanks					
A. Instrument Blanks		x		х	
B. Method Blanks		x		Х	
C. Equipment/Field Blanks		x		х	
Laboratory Control Sample (LCS)		x		х	
Laboratory Control Sample Duplicate (LCSD)		x		х	
LCS/LCSD Precision (RPD)		x		x	
Matrix Spike (MS) %R		x	х		
Matrix Spike Duplicate (MSD) %R		x	х		
MS/MSD Precision (RPD)		x		х	
Field/Lab Duplicate (RPD)		x		Х	
ICP Serial Dilution %D		x	х		
Total vs. Dissolved	x				Х
Reporting Limit Verification		x		Х	
Tier III Validation					
Initial Calibration Verification		x		х	
Continuing Calibration Verification		x		Х	
CRDL Standard Recovery		x		х	
ICP Interference Check		x		Х	
ICP-MS Internal Standards	х				Х
Transcription/calculations acceptable		х		Х	
Raw Data	Х				Х
Reporting limits adjusted to reflect sample dilutions		Х		Х	
Notes:					

%R Percent recovery

RPD Relative percent difference

%D Percent difference

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### 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.

	Qualification		
Criteria	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 spike analyses. The control limits do not apply when the parent sample concentration exceeds the spike amount by a factor of four or greater.

<u>SDG #JC81058</u>: 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.

<u>SDGs #JC80585, JC81057, and JC81225</u>: 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%
	Hexavalent Chromium, Insoluble	68.9%	AC (84.8%)
BS-A9	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 <sup>1</sup>
	Non-detect	UJ-
Spike recovery $\geq 50\%$ but $< 75\%$	Detect	J-
	Non-detect	R
Spike recovery < 50%	Detect	R
Spike recovery > 125%	Non-detect	No Action
Spike recovery > 125% but ≤ 150%	Detect	J+
Spike recovery > 150%	Detect	R

Notes:

<sup>1</sup> 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.

<u>SDG #JC80585</u>: The reanalysis of the field sample is usable. No qualification of the sample results was required.

<u>SDGs #JC81057</u>, 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  $\pm$  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.

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

### DATA VALIDATION CHECKLIST FOR HEXAVALENT CHROMIUM

%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		Analysis <sup>,</sup> 2 days				
107_M02N						
BS-114						
BS-A10	SW846 9045D		< 24 hours of receipt by laboratory			
BS-A11		Analysis: 3 days				
BS-A12						
BS-A12S						
BS-A9		Analysis: 7 days				
SW-A0(2.0-2.5)	ASTM D3872-86	Analysis: 8 days	< 24 hours from collection			
BS-A12S		Analysis: 12 days				
SW-A0(2.0-2.5)	SM4500S2 A	Analysis: 8 days	7 days from collection			
BS-A12S	- SWI430032-A	Analysis: 12 days	r days from collection			

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

	Qualification			
Criteria	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.

<u>SDGs #JC80585 and JC81058</u>: The laboratory duplicate analysis was not performed using a sample from these SDGs.

<u>SDGs #JC81057, JC81147, and JC81225</u>: 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
	Redox	333	306	8.5%
BS-A8 / DUP-1RR(20190110)	рН	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	Rep	orted	Perfor Accep	mance otable	Not Required
9045D, ASTM D1498-76	No	Yes	No	Yes	Required
Miscellaneous Instrumentation					
Tier II Validation					
Holding times		x	х		
Reporting limits (units)		x		X	
Blanks					
A. Instrument Blanks		х		Х	
B. Method blanks		x		Х	
C. Equipment blanks		Х		X	
Laboratory Control Sample (LCS) %R		Х		X	
Laboratory Control Sample Duplicate (LCSD) %R	Х				Х
LCS/LCSD Precision (RPD)	Х				Х
Matrix Spike (MS) %R	Х				Х
Matrix Spike Duplicate (MSD) %R	Х				Х
MS/MSD Precision (RPD)	Х				Х
Field/Lab Duplicate (RPD)		Х		X	
Dilution Factor		Х		X	
Tier III Validation			·		<u> </u>
Initial calibration %RSD or correlation coefficient	Х				Х
Continuing calibration %R	Х				Х
Raw Data		Х		Х	
Transcription/calculation errors present		x		Х	
Reporting limits adjusted to reflect sample dilutions		x		Х	
Notes:					

%R Percent recovery

RPD Relative percent difference

VALIDATION PERFORMED BY: Jennifer Singer

SIGNATURE:

Annifer Alinger

DATE: June 4, 2019

PEER REVIEW: Dennis Capria

DATE: June 27, 2019

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# CHAIN OF CUSTODY CORRECTED SAMPLE ANALYSIS DATA SHEETS



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ompa	y Name:	1	Project Name:																							
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et /	ddress	s	Streat								_	_				-										WW - Water
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one	1		Client Purchase	e Order #		City					State			Z	p	1										WP - Wipe
610	.755.7080																ε									FB - Field Blank EB-Equipment Blank
mpk	r(s) Name(s) P	Phone #	Project Manage	er		Attention										٦.	omi	E.								RB - Rinse Blank
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SGS Post Ex Sample COCs 20181217

JC80585: Chain of Custody Page 1 of 3

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SGS

Matrix: Project:	AQ - Field Blank S PPG Site 107, 18 C	Chapel Avenu	e, Jersey Ci	ty, NJ	Date Receiv Percent Soli	red: 12/28/18 ids: n/a	
General Chemistry	7						
Analyte	Result	RL	Units	DF	Analyzed	Bv Method	

Page 1 of 1

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 <sup>a</sup>	6.65		su	1	12/28/18 16:45	TH	SM4500H+ B-11

(a) Sample received out of holding time for pH 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

### Page 1 of 1

4.2



Client Sample ID: Lab Sample ID: Matrix: Project:	BS-114 JC80585- SO - Soil PPG Site	2R 107, 18 Cha	apel Avenue	, Jersey Cit	y, NJ	Date Sampled: Date Received Percent Solids	: 12 : 12 : 66	/28/18 /28/18 .2
General Chemistry								
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexaval	lent	< 0.60	0.60	mg/kg	1	01/03/19 12:50	DC	SW846 3060A/7196A

Page 1 of 1



### SGS LabLink@1041356 11:24 03-Jun-2019

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
		<b>Percent Solids:</b>	n/a
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

# **Report of Analysis**

### **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 <sup>1</sup>	SW846 3010A <sup>2</sup>
Chromium	< 10	10	ug/l	1	12/31/18	12/31/18 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>
Nickel	< 10	10	ug/l	1	12/31/18	12/31/18 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>
Thallium	< 10	10	ug/l	1	12/31/18	12/31/18 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>
Vanadium	< 50	50	ug/l	1	12/31/18	12/31/18 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA45916

(2) Prep QC Batch: MP11790



4



### SGS LabLink@1041356 11:24 03-Jun-2019

			-		U			_		
Client Sample ID:	FB(20181	228)								
Lab Sample ID:	JC80585-	1A				Date Sampled	: 12	/28/18		
Matrix:	AQ - Field Blank Soil					<b>Date Received:</b> 12/28/18				
	-					Percent Solids	: n/a	a		
Project:	PPG Site	107, 18 Chaj	pel Avenue,	Jersey Cit	ty, NJ					
General Chemistry								,		
Analyte		Result	RL	Units	DF	Analyzed	By	Method		
Chromium, Trivaler	nt <sup>a</sup>	< 0.020	0.020	mg/l	1	12/31/18 17:48	ND	SW846 6010/7196A M		

### **Report of Analysis**

Page 1 of 1

4.1

4

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





Client Sample ID:	BS-114		
Lab Sample ID:	JC80585-2A	Date Sampled:	12/28/18
Matrix:	SO - Soil	Date Received:	12/28/18
		<b>Percent Solids:</b>	66.2
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

### **Metals Analysis**

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Antimony	< 3.0	3.0	mg/kg	1	12/31/18	12/31/18 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	12.3	1.5	mg/kg	1	12/31/18	12/31/18 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>
Nickel	22.2	5.9	mg/kg	1	12/31/18	12/31/18 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>
Thallium	< 1.5	1.5	mg/kg	1	12/31/18	12/31/18 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>
Vanadium	16.1	7.4	mg/kg	1	12/31/18	12/31/18 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA45917

(2) Prep QC Batch: MP11789



4.2 4

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 Chap	el Avenue	, Jersey Cit	y, NJ			
General Chemistry	,							
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivaler	nt <sup>a</sup>	<del>-11.3</del> 12.3	2.1	mg/kg	1	12/31/18 14:55	DC	SW846 6010/7196A M

Page 1 of 1

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





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	Client / Reporting Information				Projec	t inform	ation													Reque	sted A	natysis		_		Matrix Codes
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1	FB(20190109)			1/9/18	1300	сс	G	FB	4			2	2	Ħ		x	x	x	x	x	x	X	$\vdash$			
2	SW-A0 (0.0-0.5)			1/9/18	0945	CC	G	so	,			Т	1			X	X	X	х	X	X	X	П			
3	SW-A0 (2.0-2.5)			1/9/18	0950	cc	G	so	1				1	Ħ		x	x	х	х	X	x	X		-		A36
4	SW-A0(4.0-4.5)			1/9/18	0955	CC	G	so	1				1	Т		X	X	X	х	X	X	X		_		Mig
5	SW-A0 (6.0-6.5)			1/9/18	1000	cc	G	<b>S</b> O	1			Ħ	1	Ħ		x	x	X	X	x	X	x	$\vdash$	-		1
6	SW-AD (8.0-8.5)			1/9/18	1005	œ	G	so	1				1			X	x	Х	х	х	X	X				(37
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INITIAL ASESSMENT LABEL VERIFICATION\_

SGS Post Ex Sample COCs 20190109

JC81057: Chain of Custody Page 1 of 5







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 < 0.010 Chromium, Hexavalent <sup>a</sup> 0.010 01/09/19 23:05 LS mg/l 1 SW846 7196A Redox Potential Vs H2 a 491 01/10/19 12:02 ri 1 mv ASTM D1498-76 pH <sup>b</sup> 6.15 1 01/09/19 16:42 FR su SM4500H+ B-11

(a) Sample received outside the holding time.

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

Page 1 of 1





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 1.4 J-Chromium, Hexavalent <sup>a</sup> 0.47 01/10/19 16:32 DC mg/kg 1 SW846 3060A/7196A Redox Potential Vs H2 a 304 01/10/19 14:23 RI mv 1 ASTM D1498-76M Solids, Percent 85.2 % 01/09/19 09:19 EB 1 SM2540 G 18TH ED MOD 7.67 1 01/10/19 13:13 RI pН SW846 9045D su

(a) Sample received outside the holding time.







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
		<b>Percent Solids:</b>	82.2
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		
General Chemistry			

Units

mg/kg

mv

%

su

DF

1

1

1

1

Analyzed

01/10/19 16:25 DC

01/10/19 14:36 RI

01/09/19 09:19 EB

01/10/19 13:21 RI

By

### **Report of Analysis**

### Page 1 of 1

SW846 3060A/7196A ASTM D1498-76M SM2540 G 18TH ED MOD SW846 9045D

Method

(a) Sample received outside the holding time.

Result

1.4 J-

403

82.2

7.78

RL

0.49

Analyte

pН

Chromium, Hexavalent <sup>a</sup>

Redox Potential Vs H2 a

Solids, Percent



Client Sample ID:	SW-A0(4.0-4.5)		
Lab Sample ID:	JC81057-4	Date Sampled:	01/09/18
Matrix:	SO - Soil	<b>Date Received:</b>	01/09/19
		<b>Percent Solids:</b>	82.3
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		
General Chemistry			

Units

mg/kg

mv

%

su

DF

1

1

1

1

Analyzed

01/10/19 16:32 DC

01/10/19 14:53 RI

01/09/19 09:19 EB

01/10/19 14:23 RI

By

### **Report of Analysis**

#### Page 1 of 1

SW846 3060A/7196A ASTM D1498-76M SM2540 G 18TH ED MOD SW846 9045D

Method

(a) Sample received outside the holding time.

Result

3.0 J-

341

82.3

8.01

RL

0.49

Analyte

pН

Chromium, Hexavalent <sup>a</sup>

Redox Potential Vs H2 a

Solids, Percent





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										

Units

mg/kg

mv

%

su

DF

1

1

1

1

Analyzed

01/10/19 16:32 DC

01/10/19 15:28 ri

01/09/19 09:19 EB

01/10/19 14:29 ri

By

### **Report of Analysis**

# Page 1 of 1

SW846 3060A/7196A ASTM D1498-76M SM2540 G 18TH ED MOD SW846 9045D

Method

(a) Sample received outside the holding time.

Result

3.2 J-

299

85.4

8.08

RL

0.47

Analyte

pН

Chromium, Hexavalent <sup>a</sup>

Redox Potential Vs H2 a

Solids, Percent





Client Sample ID:	SW-A0(6.5-7.0)								
Lab Sample ID:	JC81057-6	Date Sampled:	01/09/18						
Matrix:	SO - Soil	<b>Date Received:</b>	01/09/19						
		<b>Percent Solids:</b>	72.1						
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ								
General Chemistry									

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent <sup>a</sup>	1.6 <mark>J-</mark>	0.55	mg/kg	1	01/10/19 16:32	DC	SW846 3060A/7196A
Redox Potential Vs H2 <sup>a</sup>	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.



4.6



		Repo	rt of An	alysis			Page 1 of 1
Client Sample ID: SW-	A0(0.0-0.5)						
Lab Sample ID: JC81	057-2R				Date Sample	<b>d:</b> 01	1/09/18
Matrix: SO -	Soil				<b>Date Receive</b>	<b>d:</b> 01	1/09/19
					Percent Solid	ls: 85	5.2
Project: PPG	Site 107, 18 Cha	apel Avenue	, Jersey Cit	y, NJ			
General Chemistry							
Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent <sup>a</sup>	0.59	0.47	mg/kg	1	01/14/19 15:22	DC	SW846 3060A/7196A
(a) Sample received outsid	le the holding tim	ne.					



.

		Repo	rt of An	alysis		Page 1 of 1
Client Sample ID: SW-A(	)(2.0-2.5) 57-3R				Date Sampled:	01/09/18
Matrix: SO - S	oil				Date Received: Percent Solids:	01/09/19 82.2
Project: PPG Si	ite 107, 18 Cha	ipel Avenue	, Jersey Cit	y, NJ		
General Chemistry						
Analyte	Result	RL	Units	DF	Analyzed By	y Method
Chromium, Hexavalent <sup>a</sup>	1.3	0.49	mg/kg	1	01/14/19 15:15 Do	C SW846 3060A/7196A
(a) Sample received outside	the holding tim	ne.				



(a) Sample received outside the holding time.

0.54 J

31200

NEGATIVE UJ

0.20

120

Iron, Ferrous <sup>a</sup>

Sulfide Screen <sup>a</sup>

Total Organic Carbon <sup>a</sup>

Client Sample ID: Lab Sample ID: Matrix:	SW-A0(2.0-2.5) JC81057-3RT SO - Soil			Date Samp Date Receiv Percent Sol	led: 01 ved: 01 ids: 82	//09/18 //09/19 2.2			
Project: General Chemistry	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ y								
Analyte	Result	RL	Units	DF	Analyzed	By	Method		

1

1

1

%

mg/kg

01/17/19 12:10 ST

01/17/19 12:10 ST

01/16/19 18:48 јо

### **Report of Analysis**

### Page 1 of 1

ASTM D3872-86

SM4500S2- A-11

LLOYD KAHN 1988 MOD

4.3

RL = Reporting Limit



		Repo	rt of An	alysis	Page 1 of 1
Client Sample ID:	SW-A0(4.0-4.5)				
Lab Sample ID:	JC81057-4R				<b>Date Sampled:</b> 01/09/18
Matrix:	SO - Soil				<b>Date Received:</b> 01/09/19
					Percent Solids: 82.3
Project:	PPG Site 107, 18 Char	el Avenue	e, Jersey Cit	y, NJ	
General Chemistry					
Analyte	Result	RL	Units	DF	Analyzed By Method
Chromium, Hexavale	ent <sup>a</sup> 0.73	0.49	mg/kg	1	01/14/19 15:22 DC SW846 3060A/7196A
(a) Sample received o	outside the holding time	e.			

RL = Reporting Limit



		Repo	rt of An	alysis		Page 1 of 1
Client Sample ID: SW	-A0(6.0-6.5)					
Lab Sample ID: JC8	1057-5R				Date Sampled:	01/09/18
Matrix: SO	- Soil				Date Received:	01/09/19
					Percent Solids:	85.4
Project: PPO	G Site 107, 18 Cha	apel Avenue	, Jersey Cit	y, NJ		
General Chemistry						
Analyte	Result	RL	Units	DF	Analyzed By	y Method
Chromium, Hexavalent <sup>2</sup>	1.9	0.47	mg/kg	1	01/14/19 15:22 pc	SW846 3060A/7196A
(a) Sample received outs	de the holding tin	ne.				



		Repo	rt of An	alysis			Page 1 of 1
Client Sample ID: SW-A	)(6.5-7.0)						
Lab Sample ID: JC8105	57-6R				Date Sampled	: 01	/09/18
Matrix: SO S	oil				Date Received	: 01	/09/19
					Percent Solids	: 72	1
Project: PPG Si	ite 107, 18 Cha	pel Avenue	, Jersey Cit	y, NJ			
General Chemistry							
Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent <sup>a</sup>	3.6	0.55	mg/kg	1	01/14/19 15:22	DC	SW846 3060A/7196A
(a) Sample received outside	the holding tim	ne.				<u> </u>	



4.6 4

### SGS LabLink@1041356 11:27 03-Jun-2019

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		

# **Report of Analysis**

### **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 <sup>1</sup>	SW846 3010A <sup>2</sup>
Chromium	< 10	10	ug/l	1	01/10/19	01/10/19 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>
Nickel	< 10	10	ug/l	1	01/10/19	01/10/19 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>
Thallium	< 10	10	ug/l	1	01/10/19	01/10/19 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>
Vanadium	< 50	50	ug/l	1	01/10/19	01/10/19 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA45961

(2) Prep QC Batch: MP12023



4


#### SGS LabLink@1041356 11:27 03-Jun-2019

			-		U					
Client Sample ID:	FB(20190	)109)								
Lab Sample ID:	JC81057-	1A				Date Sampled: 01/09/18				
Matrix:	AQ - Fiel	d Blank Soil				<b>Date Received:</b> 01/09/19				
			Percent Solids: n/a							
Project:	PPG Site	PG Site 107, 18 Chapel Avenue, Jersey City, NJ								
General Chemistry										
Analyte		Result	RL	Units	DF	Analyzed	By	Method		
Chromium, Trivaler	nt <sup>a</sup>	< 0.020	0.020	mg/l	1	01/10/19 23:43	ND	SW846 6010/7196A M		

### **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
		<b>Percent Solids:</b>	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 <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	16.3	1.1	mg/kg	1	01/09/19	01/10/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	13.3	4.5	mg/kg	1	01/09/19	01/10/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>
Thallium	< 1.1	1.1	mg/kg	1	01/09/19	01/10/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>
Vanadium	20.0	5.6	mg/kg	1	01/09/19	01/10/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA45958

(2) Prep QC Batch: MP12019



4.2 **4** 



Client Sample ID: Lab Sample ID: Matrix: Project:	SW-A0(0.0-0.5) JC81057-2A Date Sampled: 01/09/18   SO - Soil Date Received: 01/09/19   PPG Site 107, 18 Chapel Avenue, Jersey City, NJ Precent Solids: 85.2							
General Chemistry	,							
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivaler	nt <sup>a</sup>	14.9	1.6	mg/kg	1	01/10/19 16:32	DC	SW846 6010/7196A M

Page 1 of 1

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

4.2





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		

**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 <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	39.5	1.2	mg/kg	1	01/09/19	01/10/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	24.8	4.7	mg/kg	1	01/09/19	01/10/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Thallium	< 1.2	1.2	mg/kg	1	01/09/19	01/10/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Vanadium	36.9	5.8	mg/kg	1	01/09/19	01/10/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA45958

(2) Prep QC Batch: MP12019



4.3 **4** 



Client Sample ID: Lab Sample ID: Matrix: Project:	SW-A0(2.0-2.5) JC81057-3A Date Sampled: 01/09/18   SO - Soil Date Received: 01/09/19   PPG Site 107, 18 Chapel Avenue, Jersey City, NJ Procent Solids: 82.2							
General Chemistry								
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivaler	nt <sup>a</sup>	38.1	1.7	mg/kg	1	01/10/19 16:25	DC	SW846 6010/7196A M

Page 1 of 1





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
		<b>Percent Solids:</b>	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 <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	25.2	1.2	mg/kg	1	01/09/19	01/10/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	28.3	4.8	mg/kg	1	01/09/19	01/10/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Thallium	< 1.2	1.2	mg/kg	1	01/09/19	01/10/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Vanadium	43.6	6.0	mg/kg	1	01/09/19	01/10/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA45958

(2) Prep QC Batch: MP12019



4.4 **4** 



Client Sample ID: Lab Sample ID: Matrix: Project:	SW-A0(4 JC81057- SO - Soil PPG Site	0-4.5) 4A 107, 18 Cha	pel Avenue,	Jersey City	Date Sampled:   01/09/18     Date Received:   01/09/19     Percent Solids:   82.3			
General Chemistry	7							
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivaler	nt <sup>a</sup>	22.2	1.7	mg/kg	1	01/10/19 16:32	DC	SW846 6010/7196A M

Page 1 of 1





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
		<b>Percent Solids:</b>	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 <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	30.9	1.2	mg/kg	1	01/09/19	01/10/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	24.2	4.8	mg/kg	1	01/09/19	01/10/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>
Thallium	< 1.2	1.2	mg/kg	1	01/09/19	01/10/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>
Vanadium	39.3	6.0	mg/kg	1	01/09/19	01/10/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA45958

(2) Prep QC Batch: MP12019



4.5 **4** 



Client Sample ID: Lab Sample ID: Matrix: Project:	SW-A0(6 JC81057- SO - Soil PPG Site	5.0-6.5) 5A 107, 18 Chaj	pel Avenue,	Jersey City	y, NJ	Date Sampled: Date Received Percent Solids	01 01 85	/09/18 /09/19 .4
General Chemistry	,							
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivaler	nt <sup>a</sup>	27.7	1.7	mg/kg	1	01/10/19 16:32	DC	SW846 6010/7196A M

Page 1 of 1





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		

**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 <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	51.5	1.3	mg/kg	1	01/09/19	01/10/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	19.5	5.3	mg/kg	1	01/09/19	01/10/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>
Thallium	< 1.3	1.3	mg/kg	1	01/09/19	01/10/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Vanadium	41.3	6.6	mg/kg	1	01/09/19	01/10/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA45958

(2) Prep QC Batch: MP12019



4.6 **4** 



Client Sample ID: Lab Sample ID: Matrix: Project:	SW-A0(6 JC81057- SO - Soil PPG Site	5.5-7.0) 6A 107, 18 Cha	apel Avenue,	Jersey Cit	y, NJ	Date Sampled Date Received Percent Solids	: 01 : 01 : 72	/09/18 /09/19 .1
General Chemistry	7							
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivaler	nt <sup>a</sup>	49.9	1.9	mg/kg	1	01/10/19 16:32	DC	SW846 6010/7196A M

Page 1 of 1





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

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

JC81058: Chain of Custody Page 1 of 3



#### SGS LabLink@1041356 11:30 03-Jun-2019

Conorol Chamister			
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		
		Percent Solids:	n/a
Matrix:	AQ - Field Blank Soil	Date Received:	01/09/19
Lab Sample ID:	JC81058-1	Date Sampled:	01/08/19
Client Sample ID:	FB(20190108)		

### **Report of Analysis**

#### General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent <sup>a</sup>	< 0.010 <b>UJ</b>	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 <sup>b</sup>	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.

### Page 1 of 1

4.1 **4** 



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		
Conoral Chamistre			

#### 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

### Page 1 of 1

4.2



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			

### 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

### Page 1 of 1

4.3

#### SGS LabLink@1041356 11:30 03-Jun-2019

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		

# **Report of Analysis**

#### **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 <sup>1</sup>	SW846 3010A <sup>2</sup>
Chromium	< 10	10	ug/l	1	01/10/19	01/10/19 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>
Nickel	< 10	10	ug/l	1	01/10/19	01/10/19 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>
Thallium	< 10	10	ug/l	1	01/10/19	01/10/19 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>
Vanadium	< 50	50	ug/l	1	01/10/19	01/10/19 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA45961

(2) Prep QC Batch: MP12023



4



#### SGS LabLink@1041356 11:30 03-Jun-2019

			-		U			
Client Sample ID:	FB(20190	108)						
Lab Sample ID:	JC81058-	1A				Date Sampled	: 01	/08/19
Matrix:	AQ - Fiel	d Blank Soil				Date Received	: 01	/09/19
						Percent Solids	: n/a	a
Project:	PPG Site	107, 18 Chap	pel Avenue,	Jersey Cit	ty, NJ			
General Chemistry								
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivaler	nt <sup>a</sup>	< 0.020	0.020	mg/l	1	01/10/19 23:49	ND	SW846 6010/7196A M

### **Report of Analysis**

Page 1 of 1





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 <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	102	1.2	mg/kg	1	01/09/19	01/10/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	12.1	4.7	mg/kg	1	01/09/19	01/10/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>
Thallium	< 1.2	1.2	mg/kg	1	01/09/19	01/10/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>
Vanadium	20.7	5.9	mg/kg	1	01/09/19	01/10/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA45958

(2) Prep QC Batch: MP12019



4.2 4



Client Sample ID: Lab Sample ID: Matrix: Project:	BS-A5 JC81058- SO - Soil PPG Site	2A 107, 18 Cha	apel Avenue,	Jersey Cit	y, NJ	Date Sampled Date Received Percent Solids	: 01 : 01 : 88	/08/19 /09/19 3.3
General Chemistry	,							J
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivaler	nt <sup>a</sup>	85.5	1.7	mg/kg	1	01/11/19 12:55	DC	SW846 6010/7196A M







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		

**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 <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	199	1.1	mg/kg	1	01/09/19	01/10/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	20.6	4.4	mg/kg	1	01/09/19	01/10/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>
Thallium	< 1.1	1.1	mg/kg	1	01/09/19	01/10/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>
Vanadium	22.7	5.5	mg/kg	1	01/09/19	01/10/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA45958

(2) Prep QC Batch: MP12019



4.3 **4** 



Client Sample ID: Lab Sample ID: Matrix: Project:	107_M02 JC81058- SO - Soil PPG Site	20N 3A 107, 18 Cha	apel Avenue.	, Jersey Cit	y, NJ	Date Sampled Date Received Percent Solids	: 01 : 01 : 88	/08/19 /09/19 .0
General Chemistry	,				-			J
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivaler	nt <sup>a</sup>	158	1.6	mg/kg	1	01/11/19 12:50	DC	SW846 6010/7196A M

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

Page 1 of 1





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Copy of SGS Post Ex Sample COCs 20190110

JC81147: Chain of Custody Page 1 of 5





#### SGS LabLink@1041356 11:32 03-Jun-2019

Project: General Chemistr	PPG Site 1	07, 18 Chaj	pel Avenue	e, Jersey Cit	ty, NJ	rercent Sono	us: m/a	
General Chemistr	y							
			DI	<b>-</b>	DE			

# **Report of Analysis**

Page 1 of 1

# 4.1 **4**

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 <sup>a</sup>	5.47		su	1	01/10/19 17:20	JP	SM4500H+ B-11

(a) Sample received out of holding time for pH 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 Rodox Potential Vs H2	1.6 J	0.48	mg/kg	1	01/11/19 16:44	DC	SW846 3060A/7196A
Solids, Percent	83.6		//// %	1	01/11/19 23.10	RC	SM2540 G 18TH ED MOD
pH	6.03		su	1	01/11/19 23:16	JO	SW846 9045D

### Page 1 of 1

4.2



#### SGS LabLink@1041356 11:32 03-Jun-2019

Lab Sample ID: JC81147-3	Date Sampled:	01/10/10
	Dute Sumplear	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		

# **Report of Analysis**

#### **General Chemistry**

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	1.3 <b>J</b> -	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

### Page 1 of 1

4.3



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 <b>J</b> -	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

### Page 1 of 1

4.4

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10 of 54

#### SGS LabLink@1041356 11:32 03-Jun-2019

Client Sample ID:	DUP-1RR(20190110)		
Lab Sample ID:	JC81147-5	Date Sampled:	01/10/19
Matrix:	SO - Soil	Date Received:	01/10/19
		<b>Percent Solids:</b>	83.7
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

# **Report of Analysis**

### **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

### Page 1 of 1

4.5



-

			Repor	t of Ana	alysis			Page 1 of 1	
Client Sample ID: Lab Sample ID: Matrix:	BS-A8 JC81147-2F SO - Soil	2				Date Sampled: Date Received: Percent Solids:	01/10/19 01/10/19		4.1
Project:	PPG Site 10	07, 18 Chape	l Avenue,	Jersey City	, NJ	r er cent Sonus.	83.0		
General Chemistry	,								
Analyte	F	Result	RL	Units	DF	Analyzed	By Meth	od	
Chromium, Hexava	lent 4	.0	0.48	mg/kg	1	01/15/19 15:59 1	DC SW846	5 30 <del>60</del> A/7196A	



JC81147R

A9				
1147-3R				<b>Date Sampled:</b> 01/10/19
- Soil				<b>Date Received:</b> 01/10/19
				Percent Solids: 78.3
3 Site 107, 18 Cha	pel Avenue	, Jersey Cit	y, NJ	
Result	RL	Units	DF	Analyzed By Method
< 0.51	0.51	mg/kg	1	01/15/19 15:55 DC SW84 <del>6 3060</del> A/7196A
	1147-3R - Soil G Site 107, 18 Cha Result < 0.51	II147-3R   - Soil   G Site 107, 18 Chapel Avenue   Result RL   < 0.51	II147-3R - Soil G Site 107, 18 Chapel Avenue, Jersey Cit Result RL Units < 0.51 0.51 mg/kg	II147-3R   - Soil   G Site 107, 18 Chapel Avenue, Jersey City, NJ   Result RL   Vinits DF   < 0.51



Result

0.95 J

7970

NEGATIVE

RL

0.20

130

Analyte

Iron, Ferrous

Sulfide Screen

Total Organic Carbon

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			

Units

mg/kg

%

DF

1

1

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Analyzed

01/17/19 12:10 st

01/17/19 12:10 st

01/16/19 19:11 јо

By

Method

ASTM D3872-86

SM4500S2- A-11

LLOYD KAHN 1988 MOD

### **Report of Analysis**

#### Page 1 of 1

4.3



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		Repo	rt of An	alysis	Pa	age 1 of 1
Client Sample ID:	BS-A9U					
Lab Sample ID:	JC81147-4R				<b>Date Sampled:</b> 01/10/19	
Matrix:	SO - Soil				<b>Date Received:</b> 01/10/19	
					Percent Solids: 81.0	
Project:	PPG Site 107, 18	Chapel Avenue	, Jersey Cit	y, NJ		
General Chemistr	y					
Analyte	Result	RL	Units	DF	Analyzed By Method	
Chromium, Hexav	alent 24.5	0.49	mg/kg	1	01/15/19 15:59 DC SW846 306	0A/7196A



-

		Repo	rt of An	alysis	Page 1 of 1
Client Sample ID:	DUP-1RR(20190110)				
Lab Sample ID:	JC81147-5R				<b>Date Sampled:</b> 01/10/19
Matrix:	SO - Soil				<b>Date Received:</b> 01/10/19
		_			Percent Solids: 83.7
Project:	PPG Site 107, 18 Cha	pel Avenue	, Jersey Cit	y, NJ	
General Chemistry	,				
Analyte	Result	RL	Units	DF	Analyzed By Method
Chromium, Hexaval	lent 8.1	0.48	mg/kg	1	01/15/19 15:59 DC <b>SW846</b> 3060A/7196A



#### SGS LabLink@1041356 11:32 03-Jun-2019

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		

# **Report of Analysis**

#### **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 <sup>1</sup>	SW846 3010A <sup>2</sup>
Chromium	< 10	10	ug/l	1	01/11/19	01/11/19 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>
Nickel	< 10	10	ug/l	1	01/11/19	01/11/19 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>
Thallium	< 10	10	ug/l	1	01/11/19	01/11/19 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>
Vanadium	< 50	50	ug/l	1	01/11/19	01/11/19 ND	SW846 6010D 1	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA45966

(2) Prep QC Batch: MP12045



4





#### SGS LabLink@1041356 11:32 03-Jun-2019

			-		•			_		
Client Sample ID:	FB(20190	)110)								
Lab Sample ID:	JC81147-	1A				Date Sampled	: 01	/10/19		
Matrix:	AQ - Fiel	AQ - Field Blank Soil <b>Date Received:</b> 01/10/19								
	-					Percent Solids	: n/a	a		
Project:	PPG Site	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ								
General Chemistry										
Analyte		Result	RL	Units	DF	Analyzed	By	Method		
Chromium, Trivaler	nt <sup>a</sup>	< 0.020	0.020	mg/l	1	01/11/19 16:41	ND	SW846 6010/7196A M		

### **Report of Analysis**

Page 1 of 1





Client Sample ID:	BS-A8		
Lab Sample ID:	JC81147-2A	Date Sampled:	01/10/19
Matrix:	SO - Soil	Date Received:	01/10/19
		<b>Percent Solids:</b>	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 <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	76.1 J	1.1	mg/kg	1	01/10/19	01/11/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	8.5	4.6	mg/kg	1	01/10/19	01/11/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>
Thallium	< 1.1	1.1	mg/kg	1	01/10/19	01/11/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>
Vanadium	17.9	5.7	mg/kg	1	01/10/19	01/11/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA45966

(2) Prep QC Batch: MP12042



4.2 **4** 



Client Sample ID: Lab Sample ID: Matrix: Project:	BS-A8 JC81147- SO - Soil PPG Site	2A 107, 18 Cha	: 01 : 01 : 83	/10/19 /10/19 5.6				
General Chemistry								
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivaler	nt <sup>a</sup>	74.5	1.6	mg/kg	1	01/11/19 16:44	DC	SW846 6010/7196A M

Page 1 of 1




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 <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	15.0 J	1.2	mg/kg	1	01/10/19	01/11/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	11.9	4.9	mg/kg	1	01/10/19	01/11/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>
Thallium	< 1.2	1.2	mg/kg	1	01/10/19	01/11/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>
Vanadium	23.7	6.1	mg/kg	1	01/10/19	01/11/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA45966

(2) Prep QC Batch: MP12042



4.3 **4** 



Client Sample ID: Lab Sample ID:	BS-A9 JC81147-	-3A				Date Sampled	: 01	/10/19
Matrix:	SO - Soil					Date Received	: 01	/10/19
Project:	PPG Site	107, 18 Cha	apel Avenue	, Jersey Cit	y, NJ	Percent Solids	: 78	5.3
General Chemistry	,							
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivaler	nt <sup>a</sup>	13.7	1.7	mg/kg	1	01/11/19 16:41	DC	SW846 6010/7196A M

Page 1 of 1

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





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 <sup>a</sup>	< 4.7 UJ-	4.7	mg/kg	2	01/10/19	01/11/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium <sup>a</sup>	1090 J	2.4	mg/kg	2	01/10/19	01/11/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>
Nickel	12.6	4.7	mg/kg	1	01/10/19	01/11/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>
Thallium <sup>a</sup>	< 2.4	2.4	mg/kg	2	01/10/19	01/11/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>
Vanadium <sup>a</sup>	25.5	12	mg/kg	2	01/10/19	01/11/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA45966

(2) Prep QC Batch: MP12042

(a) Elevated detection limit due to dilution required for high interfering element.







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 Cha	pel Avenue	, Jersey Cit	y, NJ			
General Chemistry								
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivaler	nt <sup>a</sup>	1090	2.9	mg/kg	1	01/11/19 16:44	DC	SW846 6010/7196A M

Page 1 of 1

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





#### SGS LabLink@1041356 11:32 03-Jun-2019

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			

## **Report of Analysis**

#### **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 <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	55.3 J	1.2	mg/kg	1	01/10/19	01/11/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	8.5	4.7	mg/kg	1	01/10/19	01/11/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Thallium	< 1.2	1.2	mg/kg	1	01/10/19	01/11/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>
Vanadium	18.2	5.9	mg/kg	1	01/10/19	01/11/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA45966

(2) Prep QC Batch: MP12042



4.5 4



Client Sample ID: Lab Sample ID: Matrix: Project:	DUP(201 JC81147- SO - Soil PPG Site	90110)RR 5A 107, 18 Cha	pel Avenue,	Jersey City	y, NJ	Date Sampled Date Received Percent Solids	: 01. : 01. : 83	/10/19 /10/19 .7
General Chemistry	7							
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivaler	nt <sup>a</sup>	52.1	1.7	mg/kg	1	01/11/19 16:44	DC	SW846 6010/7196A M

Page 1 of 1

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





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NITIAL ASESSMENT 38 0 V

LABEL VERIFICATION

Copy of SGS Post Ex Sample COCs 20190111

JC81225: Chain of Custody Page 1 of 5



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JC81225

SGS

#### SGS LabLink@1041356 11:33 03-Jun-2019

Analyte	Result	RL	Units	DF	Analyzed	By Method	
General Chemistry	¥.						
Project:	PPG Site 107, 18 Cha	pel Avenue	e, Jersey Ci	ty, NJ	i cicciti soli		
Matrix:	AQ - Field Blank Soil				Date Receiv Percent Soli	red: 01/11/19 ids: n/a	
Client Sample ID: Lab Sample ID:	FB(20190111)-A1 JC81225-1				Date Sampl	<b>ed:</b> 01/11/19	

## **Report of Analysis**

#### < 0.010 0.010 Chromium, Hexavalent 01/11/19 18:30 DC mg/l 1 SW846 7196A Redox Potential Vs H2 269 01/14/19 15:32 RI 1 mv ASTM D1498-76 6.47 1 01/11/19 16:41 јр su SM4500H+ B-11

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

pH <sup>a</sup>





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 Redox Potential Vs H2	1.1 <b>J</b> - 268	0.46	mg/kg mv	1 1	01/15/19 14:58 01/14/19 15:53	DC RI	SW846 3060A/7196A 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

## Page 1 of 1

4.2

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 <b>J</b> -	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

## Page 1 of 1

4.3



<b>Client Sample ID:</b>	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

## Page 1 of 1

4.4



Client Sample ID:	BS-A12S		
Lab Sample ID:	JC81225-5	Date Sampled:	01/11/19
Matrix:	SO - Soil	Date Received:	01/11/19
		<b>Percent Solids:</b>	86.5
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		
Conoral Chamistry			

#### **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

## Page 1 of 1

4.5



	-		J		
BS-A10					
JC81225-2R				<b>Date Sampled:</b> 01/11/19	)
SO - Soil				<b>Date Received:</b> 01/11/19	)
				Percent Solids: 86.2	
PPG Site 107, 18 Ch	apel Avenue	, Jersey Cit	y, NJ		
Result	RL	Units	DF	Analyzed By Met	hod
ent 1.0	0.46	mg/kg	1	01/16/19 18:04 DC SW8	46 3060A/7196A
	BS-A10 JC81225-2R SO - Soil PPG Site 107, 18 Ch Result ent 1.0	BS-A10 JC81225-2R SO - Soil PPG Site 107, 18 Chapel Avenue Result RL ent 1.0 0.46	BS-A10 JC81225-2R SO - Soil PPG Site 107, 18 Chapel Avenue, Jersey Cit Result RL Units ent 1.0 0.46 mg/kg	BS-A10 JC81225-2R SO - Soit PPG Site 107, 18 Chapel Avenue, Jersey City, NJ Result RL Units DF ent 1.0 0.46 mg/kg 1	BS-A10 JC81225-2R Date Sampled: 01/11/19   SO - Soil Date Received: 01/11/19   PPG Site 107, 18 Chapel Avenue, Jersey City, NJ Percent Solids: 86.2   Result RL Units DF Analyzed By Met   ent 1.0 0.46 mg/kg 1 01/16/19 18:04 DC Sws



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		Repo	rt of An	alysis	Page 1 of 1
Client Sample ID: BS-A1 Lab Sample ID: JC8127	1 25-3R				<b>Date Sampled:</b> 01/11/19
Project: PPG S	ite 107, 18 Cha	pel Avenue	, Jersey Cit	y, NJ	Percent Solids: 86.8
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



SGS LabLink@1041356 11:34 03-Jun-2019

			Page 1 of 1				
Client Sample ID:	BS-A12						
Lab Sample ID:	JC81225-4R					<b>Date Sampled:</b> 01/11/19	
Matrix:	SO - Soil					<b>Date Received:</b> 01/11/19	
						Percent Solids: 77.9	
Project:	PPG Site 10	7, 18 Chapel	Avenue,	Jersey City	, NJ		
General Chemistr	y						
Analyte	R	esult	RL	Units	DF	Analyzed By Meth	ıod
Chromium, Hexava	alent 2.	5	0.51	mg/kg	1	01/16/19 18:04 DC SW84	6 3060A/7196A

4.3



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		Repo	rt of An	alysis	Page 1 of 1
Client Sample ID:	BS-A12S				
Lab Sample ID:	JC81225-5R				<b>Date Sampled:</b> 01/11/19
Matrix:	SO - Soil				<b>Date Received:</b> 01/11/19
					Percent Solids: 86.5
Project:	PPG Site 107, 18 Ch	apel Avenue	Jersey Cit	y, NJ	
General Chemistry	y				
Analyte	Result	RL	Units	DF	Analyzed By Method
Chromium, Hexava	alent 0.75	0.46	mg/kg	1	01/16/19 18:00 DC SW846 3060A/7196A

## RL = Reporting Limit

Client Sample ID: Lab Sample ID: Matrix:	BS-A12S JC81225-5RT SO - Soil				Date Sampl Date Receiv	ed: 01	/11/19	
Project:	PPG Site 107, 18 Cha	pel Avenue	e, Jersey Ci	ty, NJ	Percent Sol	ius: 80	). 5	
General Chemistry	,							
Analyte	Result	RL	Units	DF	Analyzed	By	Method	

Scherur Chemistry							
Analyte	Result	RL	Units	DF	Analyzed	By	Method
Iron, Ferrous <sup>a</sup>	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 <sup>c</sup>	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.





#### SGS LabLink@1041356 11:33 03-Jun-2019

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
		<b>Percent Solids:</b>	n/a
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

## **Report of Analysis**

#### **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 <sup>1</sup>	SW846 3010A <sup>2</sup>
Chromium	< 10	10	ug/l	1	01/12/19	01/14/19 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>
Nickel	< 10	10	ug/l	1	01/12/19	01/14/19 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>
Thallium	< 10	10	ug/l	1	01/12/19	01/14/19 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>
Vanadium	< 50	50	ug/l	1	01/12/19	01/14/19 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA45977

(2) Prep QC Batch: MP12063







#### SGS LabLink@1041356 11:33 03-Jun-2019

Client Sample ID: Lab Sample ID: Matrix: Project:	FB(20190 JC81225- AQ - Fiel PPG Site	0111)-A1 1A d Blank Soil 107, 18 Chape	el Avenue,	Date Sampled Date Received Percent Solids	: 01/ : 01/ : n/a	/11/19 /11/19		
General Chemistry								
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivaler	nt <sup>a</sup>	< 0.020	0.020	mg/l	1	01/14/19 16:18	ND	SW846 6010/7196A M

## **Report of Analysis**

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

Page 1 of 1





Client Sample ID:	BS-A10		
Lab Sample ID:	JC81225-2A	Date Sampled:	01/11/19
Matrix:	SO - Soil	Date Received:	01/11/19
		<b>Percent Solids:</b>	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 <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	12.0	1.1	mg/kg	1	01/11/19	01/14/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	8.1	4.6	mg/kg	1	01/11/19	01/14/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>
Thallium	< 1.1	1.1	mg/kg	1	01/11/19	01/14/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>
Vanadium	18.7	5.7	mg/kg	1	01/11/19	01/14/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA45974

(2) Prep QC Batch: MP12061



4.2 **4** 



Client Sample ID: Lab Sample ID: Matrix: Project:	BS-A10 JC81225- SO - Soil PPG Site	BS-A10 JC81225-2A SO - Soil PPG Site 107, 18 Chapel Avenue, Jersey City, NJ Date Sampled: 01/11/19 Date Received: 01/11/19 Percent Solids: 86.2								
General Chemistry	General Chemistry									
Analyte		Result	RL	Units	DF	Analyzed	By	Method		
Chromium, Trivaler	nt <sup>a</sup>	10.9	1.6	mg/kg	1	01/15/19 14:58	DC	SW846 6010/7196A M		

Page 1 of 1

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

4.2



Client Sample ID:	BS-A11		
Lab Sample ID:	JC81225-3A	Date Sampled:	01/11/19
Matrix:	SO - Soil	Date Received:	01/11/19
		<b>Percent Solids:</b>	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 <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	14.4	1.1	mg/kg	1	01/11/19	01/14/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	11.8	4.5	mg/kg	1	01/11/19	01/14/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>
Thallium	< 1.1	1.1	mg/kg	1	01/11/19	01/14/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>
Vanadium	21.3	5.6	mg/kg	1	01/11/19	01/14/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA45974

(2) Prep QC Batch: MP12061



4.3 **4** 



	DG 111									
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	PG Site 107, 18 Chapel Avenue, Jersey City, NJ								
General Chemistry	General Chemistry									
Analyte		Result	RL	Units	DF	Analyzed	By	Method		
Chromium, Trivaler	nt <sup>a</sup>	12.5	1.6	mg/kg	1	01/15/19 14:58	DC	SW846 6010/7196A M		

Page 1 of 1

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





Client Sample ID:	BS-A12		
Lab Sample ID:	JC81225-4A	Date Sampled:	01/11/19
Matrix:	SO - Soil	Date Received:	01/11/19
		<b>Percent Solids:</b>	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 <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	23.7	1.2	mg/kg	1	01/11/19	01/14/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	7.0	4.9	mg/kg	1	01/11/19	01/14/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>
Thallium	< 1.2	1.2	mg/kg	1	01/11/19	01/14/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>
Vanadium	12.3	6.2	mg/kg	1	01/11/19	01/14/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA45974

(2) Prep QC Batch: MP12061

RL = Reporting Limit







Client Sample ID: Lab Sample ID: Matrix:	BS-A12 JC81225- SO - Soil	-4A				Date Sampled Date Received	: 01 : 01	/11/19 /11/19
Project: PPG Site 107, 18 Chapel Avenue, Jersey City, NJ General Chemistry								
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivaler	nt <sup>a</sup>	20.5	1.7	mg/kg	1	01/15/19 14:58	DC	SW846 6010/7196A M

Page 1 of 1

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





Client Sample ID:	BS-A12S		
Lab Sample ID:	JC81225-5A	Date Sampled:	01/11/19
Matrix:	SO - Soil	Date Received:	01/11/19
		<b>Percent Solids:</b>	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 <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	24.7	1.1	mg/kg	1	01/11/19	01/14/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	16.2	4.4	mg/kg	1	01/11/19	01/14/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>
Thallium	< 1.1	1.1	mg/kg	1	01/11/19	01/14/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>
Vanadium	21.9	5.6	mg/kg	1	01/11/19	01/14/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA45974

(2) Prep QC Batch: MP12061



4.5 **4** 



Client Sample ID: Lab Sample ID: Matrix: Project:	BS-A12S JC81225-5A Date Sampled: 01/11/19   SO - Soil Date Received: 01/11/19   PPG Site 107, 18 Chapel Avenue, Jersey City, NJ 86.5							
General Chemistry								
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivaler	nt <sup>a</sup>	22.3	1.6	mg/kg	1	01/15/19 14:55	DC	SW846 6010/7196A M

Page 1 of 1

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







**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:

SDC Samala ID				Sample		Analysis		
SDG	Sample ID	Lab ID	Matrix	Collection Date	Parent Sample	Cr VI	MET	MISC
100/070	FB(20190115)-A1	JC81350-1	Water	1/15/2019		x	Х	х
JC81350	BS-A0	JC81350-2	Soil	1/15/2019		x	х	х
	FB(20190116)	JC81419-1	Water	1/16/2019		x	Х	х
JC81419	BS-A9V	JC81419-2	Soil	1/16/2019		x	Х	х
	107_M020N(A)	JC81419-3	Soil	1/16/2019		x	Х	х
1004507	FB(20190118)	JC81597-1	Water	1/18/2019		x	Х	х
JC81597	BS-A0S	JC81597-2	Soil	1/18/2019		x	Х	х
	FB(20190121)-A1	JC81644-1	Water	1/21/2019		x	Х	х
JC81644	BS-A14	JC81644-3	Soil	1/21/2019		x	Х	х
	107-M028E2	JC81644-4	Soil	1/21/2019		x	х	х
	FB(20190122)	JC81681-1	Water	1/22/2019		x	Х	х
	107-M028W	JC81681-2	Soil	1/22/2019		x	х	х
	BS-A15	JC81681-3	Soil	1/22/2019		x	Х	х
JC81681	107-M030E2	JC81681-4	Soil	1/22/2019		x	х	х
	BS-A16S	JC81681-5	Soil	1/22/2019		X	Х	х
	DUP-02(20190122)RR	JC81681-6	Soil	1/22/2019	107-M028W	Х	Х	х
	BS-A16I	JC81681-7	Soil	1/22/2019		х	Х	х

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. <u>SDGs #JC81419 and JC81681</u>: 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.

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

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
	Water	180 days from collection to analysis	Preserved to a pH of less than 2; Cool to <6°C
SW-846 6010C	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.

<u>SDG #JC81681</u>: 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
	Non-detect	UJ-
MS/MSD percent recovery 30% to 74%	Detect	J-
	Non-detect	R
MS/MSD percent recovery < 30%	Detect	J-
	rol limitSample ResultQualification0% to 74%Non-detectUJ-DetectJ-30%Non-detectR20%DetectJ-125%Non-detectNo Action125%DetectJ+	No Action
MS/MSD percent recovery > 125%		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.

<u>SDG #JC81681</u>: 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.

Sample ID/Duplicate ID	Analyte	Sample Result	Duplicate Result	RPD
	Chromium	18.1	19.6	8.0%
	Trivalent Chromium	17.7	19.1	7.6%
107-M028W / DUP-02(20190122)RR	Nickel	11.2	11.6	
	Vanadium	28.2	35.5	AC

Results for duplicate samples are summarized in the following table.

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.

<u>SDG #JC81681</u>: 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	Repo	orted	Perfo Acce	rmance ptable	Not
	No	Yes	No	Yes	Required
Inductively Coupled Plasma-Atomic Emission Spectrometer	ry (ICP-AE	S)			
Tier II Validation			-		
Holding Times		x		x	
Reporting limits (units)		x		x	
Blanks					
A. Instrument Blanks		Х		x	
B. Method Blanks		x		x	
C. Equipment/Field Blanks		x		x	
Laboratory Control Sample (LCS)		x		х	
Laboratory Control Sample Duplicate (LCSD)	Х				Х
LCS/LCSD Precision (RPD)	Х				Х
Matrix Spike (MS) %R		x	х		
Matrix Spike Duplicate (MSD) %R		Х	х		
MS/MSD Precision (RPD)		x		х	
Field/Lab Duplicate (RPD)		Х		X	
ICP Serial Dilution %D		x		х	
Total vs. Dissolved	Х				Х
Reporting Limit Verification		x		X	
Tier III Validation	·				
Initial Calibration Verification		x		x	
Continuing Calibration Verification		x		х	
CRDL Standard Recovery		x		x	
ICP Interference Check		x		X	
ICP-MS Internal Standards	Х				Х
Transcription/calculations acceptable		Х		Х	
Raw Data	Х				Х
Reporting limits adjusted to reflect sample dilutions		Х		Х	
Notes:					

%R Percent recovery

RPD Relative percent difference

%D Percent difference

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#### 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.

<u>SDG #JC81597</u>: 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.

<u>SDGs #JC81350 and JC81681</u>: 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.

<u>SDGs #JC81350, JC81419, JC81681</u>: 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%)
	Hexavalent Chromium, Soluble	< 50%	56.7%
BS-A9V	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 <sup>1</sup>
	Non-detect	UJ-
Spike recovery $\geq 50\%$ but $< 75\%$	Detect	J-
	Non-detect	R
Spike recovery < 50%	Detect	R
Spike recovery > 125%	Non-detect	No Action
Spike recovery > 125% but ≤ 150%	Detect	J+
Spike recovery > 150%	Detect	Qualification <sup>1</sup> UJ- J- R R R No Action J+ R

Notes:

<sup>1</sup> 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.

<u>SDG #JC81350</u>: The reanalysis of the field sample is usable. No qualification of the sample results was required.

<u>SDGs #JC81419 and JC81681</u>: 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  $\pm$  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.

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

#### DATA VALIDATION CHECKLIST FOR HEXAVALENT CHROMIUM

%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	ASTM D3872-86	Analysis: 7 days	< 24 hours from collection
BS-A15	AGTM D3072-00	Analysis. 7 days	

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

	Qualifi	cation
Criteria	Detected Analytes	Non-detect Analytes
Analysis completed less than two times holding time	J	ication Non-detect Analytes UJ R
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.

<u>SDGs #JC81350, JC81419, and JC81597</u>: The laboratory duplicate analysis was not performed using a sample from these SDGs.

<u>SDGs #JC81644 and JC81681</u>: 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
	Redox Potential	263	255	3.1%
107-M028W / DUP-02(20190122)RR	рН	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	Rep	orted	Perfor Accep	mance otable	Not Required
9045D, ASTM D1498-76	No	Yes	No	Yes	Required
Miscellaneous Instrumentation					
Tier II Validation					
Holding times		x	х		
Reporting limits (units)		x		X	
Blanks					
A. Instrument Blanks		х		Х	
B. Method blanks		х		Х	
C. Equipment blanks		Х		X	
Laboratory Control Sample (LCS) %R		Х		X	
Laboratory Control Sample Duplicate (LCSD) %R	Х				Х
LCS/LCSD Precision (RPD)	Х				Х
Matrix Spike (MS) %R	Х				Х
Matrix Spike Duplicate (MSD) %R	Х				Х
MS/MSD Precision (RPD)	Х				Х
Field/Lab Duplicate (RPD)		Х		X	
Dilution Factor		Х		X	
Tier III Validation			·		<u> </u>
Initial calibration %RSD or correlation coefficient	Х				Х
Continuing calibration %R	Х				Х
Raw Data		Х		Х	
Transcription/calculation errors present		x		Х	
Reporting limits adjusted to reflect sample dilutions		x		Х	
Notes:					

%R Percent recovery

RPD Relative percent difference

VALIDATION PERFORMED BY: Jennifer Singer

SIGNATURE:

Annifer Alinger

DATE: June 5, 2019

PEER REVIEW: Dennis Capria

DATE: June 27, 2019

# CHAIN OF CUSTODY CORRECTED SAMPLE ANALYSIS DATA SHEETS



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Matt Bell	NPODDT	70.0001	*00008	01								_	1.1	-	2									AIR - Air SOL - Other Solid
646-762-5629	ax # Client Purchase	Order #		City			St	ate		2	Δip		ê	ŝ	0	3	2	2	$\vdash$					WP - Wipe FB-Field Blank
Sampler(s) Name(s)	Phone # Project Manager	1. 110		Attention:									Ę	2	4	40	5	10	5					EB-Equipment Blank RB- Rinse Blank
6.QUINONES 201-742-	3460 Jim M	Collect	ion .					Numbe	r of pres	erved b	ottes		-	ž	-g	50	Ĩ	学	5					TB-Trip Blank
Lab Sample # Field ID / Point of Collection	MEOH/DI Vial #	Date	Time	Sampled by	Matrix	# of bottles	HCI NaOH	HN03	H2SO4 NONE	Di Water	RECORE	$\Box$	40	Hex	2	Va,	4	à	ţź					LAB USE ONLY
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JC81350: Chain of Custody Page 1 of 3

SGS

5.2

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#### SGS LabLink@1041356 11:35 03-Jun-2019

General Chemistry	7						
Project:	PPG Site 107, 18 Cha	apel Avenue	e, Jersey Cit	ty, NJ	Percent Soli	ids: n/a	
Client Sample ID: Lab Sample ID: Matrix:	FB(20190115)-A1 JC81350-1 AQ - Field Blank Soi	l			Date Sampl Date Receiv	ed: 01/15/1 red: 01/15/1	9 9

mg/l

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01/15/19 21:05 DC

01/16/19 12:04 RI

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0.010

### **Report of Analysis**

Page 1 of 1

SW846 7196A

ASTM D1498-76

SM4500H+ B-11

4.4

RL = Reporting Limit

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

< 0.010

290

5.54

Chromium, Hexavalent

Redox Potential Vs H2

pH <sup>a</sup>





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	0.03	0.47	mø/kø	1	01/16/19 17:05	DC	SW846 3060A/7196A
Redox Potential Vs H2	276	0.17	my	1	01/16/19 15:28	RI	ASTM D1/08-76M
Solida Darcont	270		0/	1	01/10/17 15.20		SM2540 C 19TH ED MOD
Solius, Percent	04.0		%0	1	01/10/19/09.11	ĸĊ	SM2540 G 181H ED MOD
pH	7.23		su	1	01/16/19 15:17	RI	SW846 9045D

#### Page 1 of 1

4.2



Client Sample ID: Lab Sample ID: Matrix: Project:	BS-A0 JC81350- SO - Soil PPG Site	2R 107, 18 Cha	apel Avenue,	Jersey Cit	y, NJ	Date Sampled: Date Received Percent Solids	: 01 : 01 : 84	/15/19 /15/19 .8
General Chemistry								
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexava	lent	0.87	0.47	mg/kg	1	01/21/19 13:04	RI	SW846 3060A/7196A

Page 1 of 1



#### SGS LabLink@1041356 11:35 03-Jun-2019

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
		<b>Percent Solids:</b>	n/a
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

## **Report of Analysis**

#### **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 <sup>1</sup>	SW846 3010A <sup>2</sup>
Chromium	< 10	10	ug/l	1	01/15/19	01/16/19 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>
Nickel	< 10	10	ug/l	1	01/15/19	01/16/19 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>
Thallium	< 10	10	ug/l	1	01/15/19	01/16/19 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>
Vanadium	< 50	50	ug/l	1	01/15/19	01/16/19 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA45992

(2) Prep QC Batch: MP12103



4



#### SGS LabLink@1041356 11:35 03-Jun-2019

Client Sample ID: Lab Sample ID: Matrix: Project:	FB(20190 JC81350- AQ - Fiel	)115)-A1 1A d Blank Soil 107 18 Char	Del Avenue	Jersev Cit	v NI	Date Sampled Date Received Percent Solids	: 01/ : 01/ : n/a	/15/19 /15/19 1
General Chemistry	, ,	107, 10 Chap			y, 1 <b>1</b> 3			
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivaler	nt <sup>a</sup>	< 0.020	0.020	mg/l	1	01/16/19 15:11	ND	SW846 6010/7196A M

### **Report of Analysis**

Page 1 of 1

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





Client Sample ID:	BS-A0		
Lab Sample ID:	JC81350-2A	Date Sampled:	01/15/19
Matrix:	SO - Soil	Date Received:	01/15/19
		<b>Percent Solids:</b>	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 <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	18.0	1.2	mg/kg	1	01/15/19	01/16/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	16.6	4.6	mg/kg	1	01/15/19	01/16/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>
Thallium	< 1.2	1.2	mg/kg	1	01/15/19	01/16/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>
Vanadium	25.7	5.8	mg/kg	1	01/15/19	01/16/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA45992

(2) Prep QC Batch: MP12101



4.2 **4** 



Client Sample ID: Lab Sample ID: Matrix: Project:	BS-A0 JC81350- SO - Soil PPG Site	2A 107, 18 Cha	pel Avenue	, Jersey Cit	y, NJ	Date Sampled Date Received Percent Solids	: 01 : 01 : 84	/15/19 /15/19 .8
General Chemistry	,							
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivaler	nt <sup>a</sup>	17.1	1.7	mg/kg	1	01/16/19 17:05	DC	SW846 6010/7196A M

Page 1 of 1

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

4.2



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INITIAL ASESSMENT 3A 7 LABEL VERIFICATION

SGS Post Ex Sampla COCs Template 20190109

JC81419: Chain of Custody Page 1 of 5



É



General Chemistry	y						
Project:	PPG Site 107, 18 C	Chapel Avenu	e, Jersey Ci	ty, NJ	Percent Solids	n/a	
Client Sample ID: Lab Sample ID: Matrix:	FB(20190116) JC81419-1 AQ - Field Blank S	oil			Date Sampled Date Received	: 01/16/19 : 01/16/19	

Page 1 of 1

4.1 **4** 

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 <sup>a</sup>	4.24		su	1	01/16/19 17:10	SUB	SM4500H+ B-11

(a) Sample received out of holding time for pH 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		
C			

#### **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

#### Page 1 of 1

4.2



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		
C			

#### General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	1.6 <b>J</b> -	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

#### Page 1 of 1

4.3



-

			Repo	rt of An	alysis	Page 1 of 1
Client Sample ID: Lab Sample ID:	BS-A9V IC81419	-2R				Date Sampled: 01/16/19
Matrix:	SO - Soil					Date Received: 01/16/19 Percent Solids: 81.0
Project:	PPG Site	107, 18 Cha	apel Avenue,	Jersey Cit	y, NJ	
General Chemistry	y					
Analyte		Result	RL	Units	DF	Analyzed By Method
Chromium, Hexava	alent	< 0.49	0.49	mg/kg	1	01/21/19 15:05 ri sw846 3060A/7196A



4.1 **4**  Iron, Ferrous <sup>a</sup>

Sulfide Screen b

Total Organic Carbon

Client Sample ID: Lab Sample ID: Matrix: Project:	BS-A9V JC81419-2RT SO - Soil PPG Site 107, 18 Chap	pel Avenue	e, Jersey Cit	y, NJ	Date Sampl Date Receiv Percent Soli	ed: 01 ved: 01 ids: 81	/16/19 /16/19 .0	
General Chemistry	,							
Analyte	Result	RL	Units	DF	Analyzed	By	Method	

1

1

1

01/23/19 13:10 мр

01/23/19 13:10 мр

01/25/19 22:58 CD

%

mg/kg

#### **Report of Analysis**

(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.

0.20

120

0.56 J

1780

NEGATIVE

(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.



ASTM D3872-86

SM4500S2- A-11

LLOYD KAHN 1988 MOD





_		керо	rt of An	alysis		Page 1 of 1
Client Sample ID:	107_M020N(A)					
Lab Sample ID:	JC81419-3R				<b>Date Sampled:</b> 01/16/1	9
Matrix:	SO - Soil				<b>Date Received:</b> 01/16/1	9
					Percent Solids: 84.3	
Project:	PPG Site 107, 18 Ch	apel Avenue	, Jersey Cit	y, NJ		
General Chemistry						1
Analyte	Result	RL	Units	DF	Analyzed By Me	thod
Chromium, Hexavale	nt 1.2	0.47	mg/kg	1	01/21/19 15:06 RI SW8	346 3069A/7196A

#### р 4 of A .1.

4.3



#### SGS LabLink@1041356 11:36 03-Jun-2019

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		

## **Report of Analysis**

#### **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 <sup>1</sup>	SW846 3010A <sup>2</sup>
Chromium	< 10	10	ug/l	1	01/17/19	01/17/19 gt	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>
Nickel	< 10	10	ug/l	1	01/17/19	01/17/19 GT	SW846 6010D 1	SW846 3010A <sup>2</sup>
Thallium	< 10	10	ug/l	1	01/17/19	01/17/19 GT	SW846 6010D 1	SW846 3010A <sup>2</sup>
Vanadium	< 50	50	ug/l	1	01/17/19	01/17/19 GT	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA45999

(2) Prep QC Batch: MP12109



4



Client Sample ID: Lab Sample ID: Matrix: Project:	FB(20190116)Date Sampled:01/16/19JC81419-1ADate Sampled:01/16/19AQ - Field Blank SoilDate Received:01/16/19PPG Site 107, 18 Chapel Avenue, Jersey City, NJn/a								
General Chemistry									
Analyte		Result	RL	Units	DF	Analyzed	By	Method	
Chromium, Trivaler	nt <sup>a</sup>	< 0.020	0.020	mg/l	1	01/17/19 15:50	GT	SW846 6010/7196A M	

Page 1 of 1

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



44





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 <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	78.3	1.2	mg/kg	1	01/17/19	01/17/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	9.5	4.7	mg/kg	1	01/17/19	01/17/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>
Thallium	< 1.2	1.2	mg/kg	1	01/17/19	01/17/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>
Vanadium	20.0	5.9	mg/kg	1	01/17/19	01/17/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA46001

(2) Prep QC Batch: MP12125



4.2 **4** 



JC81419A

Client Sample ID: Lab Sample ID: Matrix:	BS-A9V JC81419- SO - Soil	2A				Date Sampled Date Received Percent Solids	: 01 : 01 : 81	/16/19 /16/19 .0
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ							
General Chemistry								
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivaler	nt <sup>a</sup>	75.9	1.7	mg/kg	1	01/17/19 16:50	DC	SW846 6010/7196A M

Page 1 of 1

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





Client Sample ID:	107_M020N(A)		
Lab Sample ID:	JC81419-3A	Date Sampled:	01/16/19
Matrix:	SO - Soil	Date Received:	01/16/19
		<b>Percent Solids:</b>	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 <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	22.5	1.2	mg/kg	1	01/17/19	01/17/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>
Nickel	16.0	4.7	mg/kg	1	01/17/19	01/17/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>
Thallium	< 1.2	1.2	mg/kg	1	01/17/19	01/17/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>
Vanadium	23.2	5.9	mg/kg	1	01/17/19	01/17/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA46001

(2) Prep QC Batch: MP12125



4.3 **4** 



Client Sample ID: Lab Sample ID: Matrix: Project:	107_M02 JC81419- SO - Soil PPG Site	apel Avenue	Date Sampled: Date Received Percent Solids	Date Sampled: 01/16/19   Date Received: 01/16/19   Percent Solids: 84.3				
General Chemistry								
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivaler	nt <sup>a</sup>	20.9	1.7	mg/kg	1	01/17/19 16:53	DC	SW846 6010/7196A M

Page 1 of 1

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

4.3



SGS Post Ex Sample COCs Template 20190109

JC81597: Chain of Custody Page 1 of 2



5.2

СЛ

Chromium, Hexavalent

Redox Potential Vs H2

pH <sup>a</sup>

< 0.010

356

6.09

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

Client Sample ID: Lab Sample ID:	FB(20190118) JC81597-1				Date Sample	<b>d:</b> 01/18/19	
Matrix: Project:	AQ - Field Blank	Soil Chapel Avenu	e, Jersey Ci	ty, NJ	Date Receive Percent Solid	<b>d:</b> 01/18/19  s: n/a	
General Chemistry	7						
Analyte	Result	RL	Units	DF	Analyzed	By Method	

mg/l

mv

su

1

1

1

01/18/19 19:40 DC

01/21/19 16:33 ев

01/18/19 17:07 FR

0.010

### **Report of Analysis**

Page 1 of 1

SW846 7196A

ASTM D1498-76

SM4500H+ B-11

4.1 **4** 



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 <mark>J</mark>		su	1	01/21/19 11:53	EB	SW846 9045D

#### Page 1 of 1

4.2


### SGS LabLink@1041356 11:37 03-Jun-2019

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		

# **Report of Analysis**

### **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 <sup>1</sup>	SW846 3010A <sup>2</sup>
Chromium	< 10	10	ug/l	1	01/19/19	01/21/19 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>
Nickel	< 10	10	ug/l	1	01/19/19	01/21/19 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>
Thallium	< 10	10	ug/l	1	01/19/19	01/21/19 ND	SW846 6010D 1	SW846 3010A <sup>2</sup>
Vanadium	< 50	50	ug/l	1	01/19/19	01/21/19 ND	SW846 6010D 1	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA46015

(2) Prep QC Batch: MP12177



4



### SGS LabLink@1041356 11:37 03-Jun-2019

Client Sample ID: Lab Sample ID: Matrix:	FB(20190 JC81597-	)118) 1A d Blank Soil	-			Date Sampled	: 01	/18/19
Project:	PPG Site	107 18 Char	pel Avenue	Jersev Cit	v NI	Percent Solids	: 01 : n/a	a
General Chemistry	,				.,			
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivaler	nt <sup>a</sup>	< 0.020	0.020	mg/l	1	01/21/19 15:52	ND	SW846 6010/7196A M

## **Report of Analysis**

Page 1 of 1



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 <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	26.0	1.1	mg/kg	1	01/19/19	01/21/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	18.4	4.5	mg/kg	1	01/19/19	01/21/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>
Thallium <sup>a</sup>	< 2.3	2.3	mg/kg	2	01/19/19	01/21/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>
Vanadium	43.1	5.6	mg/kg	1	01/19/19	01/21/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA46015

(2) Prep QC Batch: MP12179

(a) Elevated detection limit due to dilution required for high interfering element.







Client Sample ID: Lab Sample ID: Matrix: Project:	BS-A0S JC81597- SO - Soil PPG Site	2A 107, 18 Ch	apel Avenue,	Jersey Cit	y, NJ	Date Sampled Date Received Percent Solids	: 01 : 01 : 87	/18/19 /18/19 .1
General Chemistry								]
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivaler	nt <sup>a</sup>	24.9	1.6	mg/kg	1	01/22/19 15:28	DC	SW846 6010/7196A M

Page 1 of 1





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Client / Reporting Information			Project	www.sgs.	com/ehs	usa						303 00	Req	uestec	Anal	ysis (	see T	EST C	ODE	sheet)	56	81	644 Matrix Codes
Company Name	Project Name:	Sar	107	150	Cris I	Grad	$\sum$																DW - Drinking Water
Street Address	n Street	i he	101		rigi	10 10 10			- 1-Q	t <mark>b</mark>			F	2									3W - Ground Water WW - Water SW - Surface Water
City State Zip	City City	el ne	A State	Billing Info Company N	rmation ( ame	lf differen	t from	Report	to)			5	m	ŝ									SO - Soil SL- Sludge SED-Sediment
Project Contact E-ma	U HESCY	LITY	100	Street Addre	988							n,	10	20 n									OI - Oil LIQ - Other Liquid
MATTHEW BELLE ARCIOS.CO	Client Purchase	Order #	)	City			St	tate		Zip		EC 2	1	E				5					AIR - Air SOL - Other Solid WP - Wipe
610 - 755 - 7080 Sampler(s) Name(s) Phor	e # Project Manager			Attention:								E	₩,	5	5n	_	ξ	2	-			E	FB-Field Blank B-Equipment Blank RB- Rinse Blank
C. CIFELLI	Jim M	CLAUGHL	IN, JK					Number	of prese	rved botti	es	Ę	LWN-1	A B	DMD	3	Ę	DAD					TB-Trip Blank
Lab Sample # Field ID / Point of Collection	MEOH/DI Vial #	Date	Time	Sampled by	Matrix	# of bottles	HCI	HN03	H2SO4 NONE	DI Water MEOH	ENCORE	ToT	Hexi	LE IV	ANT	NC NC		1×1					LAB USE ONLY
1 FB(20190121)-M		1/21/19	1410	CC	6	2		ł	۱			X	¥	¥	$\checkmark$	۶	¥	X					A18
2 BS-A13		112119	1300	23	6	1			<b>\</b>			$\mathbf{\lambda}$	¥	X	¥	×	Ý	۴			_		63
3 BS-A14		1/21/19	1315	a	<u>s</u>	1	$\downarrow \downarrow$	++	N	_		X	Y	X	X	Ϋ́	8	¥			_	_	
4 107-MU28EZ		1/21/19	1425	10	6	1	$\left  \right $	+	-14	+	$\vdash$	12	X	۶	Х-	X	17	۲×				-+	DYD
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Turnaround Time ( Business days)	Approved by (S	GS Project Manage	ar)/Date:		ommercia	Data	vel 1)	erable	Informa	NYASI	PCateo						Com	ments /	Specia	I Instruc	tions		
Std. 10 Business Days			-		ommercia	I "B" ( Lev	vel 2)			NYAS	P Categ	ory B								-4	0 7	~ ^	
5 Day RUSH			_		J Reduced	.eve: 3+4 ) d			ø	EDD F	Forms Format	EQU	S ا		11	AITIN	LAS	SESS	MENT	r_	r,	17	
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other			_	Commercial	"A" = Res	uits Only;	Com	mercial	"B" = R	esults +	QC Su	mmary				MOCI	VIE						
Emergency & Rush T/A data available via LabLink	5	Sample Custody	must be docu	Imprited be	d = Result	time san	nples	+ Partia	Raw d	ata ession	Ficlu	ding co	urier d	Samp	le inv	entor	y is ve	erified	upon	receipt	in the	Labo	atory
Reliquished by Sampler: Date	21/19/1431	Received By:	hK	len			Relinqu 2	1 2	y:	G	in	6	1.	21	DataTin	ю: /b	15	Receive 2	d By:	$\triangleleft$			
Relinquished by Sampler: Date	Time:	Received By: 3					Relingu 4	uished E	y://						Date Tim	NO:		Receive 4	d By:				
Relinquished by: 5	Time:	Received By: 5					Custod	ab	38			Intect Not inta	ict	Preserve	d where	applica	ble			On Ice	c	ooler Te	mp.
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Form:SM088-03C (revised 2/12/18)

JC81644: Chain of Custody Page 1 of 4

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



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General Chemistry	7					
Project:	PPG Site 107, 18 Cha	pel Avenu	e, Jersey Ci	y, NJ	I creent Sond	
Matrix:	AQ - Field Blank Soil				Date Receive Percent Solid	d: 01/21/19 ls: n/a
Client Sample ID: Lab Sample ID:	FB(20190121)-A1 JC81644-1				Date Sample	<b>d:</b> 01/21/19

4.1 **4** 

Page 1 of 1

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 <sup>a</sup>	6.42		su	1	01/21/19 16:38	FR	SM4500H+ B-11

(a) Sample received out of holding time for pH 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

### Page 1 of 1

4.2



Client Sample ID: Lab Sample ID: Matrix:	107-M028E2 JC81644-4 SO - Soil	Date Sampled: Date Received: Percent Solids:	01/21/19 01/21/19 88.6
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	i ci cent Sonus.	00.0
Conoral Chamistry			

### **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

### Page 1 of 1

4.3

### SGS LabLink@1041356 11:39 03-Jun-2019

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		

# **Report of Analysis**

### **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 <sup>1</sup>	SW846 3010A <sup>2</sup>
Chromium	< 10	10	ug/l	1	01/21/19	01/22/19 GT	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>
Nickel	< 10	10	ug/l	1	01/21/19	01/22/19 GT	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>
Thallium	< 10	10	ug/l	1	01/21/19	01/22/19 GT	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>
Vanadium	< 50	50	ug/l	1	01/21/19	01/22/19 GT	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA46022

(2) Prep QC Batch: MP12199







Client Sample ID: Lab Sample ID: Matrix: Project:	ID:       FB(20190121)-A1         D:       JC81644-1A         AQ - Field Blank Soil       Date Sampled: 01/21/19         PPG Site 107, 18 Chapel Avenue, Jersey City, NJ       Precent Solids: n/a										
General Chemistry	,										
Analyte Result RL Units DF Analyzed By Method											
Chromium, Trivaler	nt <sup>a</sup>	< 0.020	0.020	mg/l	1	01/22/19 12:39	GT	SW846 6010/7196A M			

Page 1 of 1

44

4



Client Sample ID:	BS-A14		
Lab Sample ID:	JC81644-3A	Date Sampled:	01/21/19
Matrix:	SO - Soil	Date Received:	01/21/19
		<b>Percent Solids:</b>	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 <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	14.3	1.2	mg/kg	1	01/21/19	01/22/19 дт	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	11.4	5.0	mg/kg	1	01/21/19	01/22/19 дт	SW846 6010D 1	SW846 3050B <sup>2</sup>
Thallium	< 1.2	1.2	mg/kg	1	01/21/19	01/22/19 GT	SW846 6010D 1	SW846 3050B <sup>2</sup>
Vanadium	20.8	6.2	mg/kg	1	01/21/19	01/22/19 GT	SW846 6010D 1	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA46022

(2) Prep QC Batch: MP12179



4.2 **4** 



Client Sample ID: Lab Sample ID: Matrix: Project:	D: BS-A14 JC81644-3A SO - Soil PPG Site 107, 18 Chapel Avenue, Jersey City, NJ Date Sampled: 01/21/19 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, Trivaler	nt <sup>a</sup>	13.9	1.7	mg/kg	1	01/22/19 16:44	RI	SW846 6010/7196A M		







Client Sample ID:	107-M028E2		
Lab Sample ID:	JC81644-4A	Date Sampled:	01/21/19
Matrix:	SO - Soil	Date Received:	01/21/19
		<b>Percent Solids:</b>	88.6
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	2.3	mg/kg	1	01/21/19	01/22/19 GT	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	16.6	1.1	mg/kg	1	01/21/19	01/22/19 GT	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	14.6	4.6	mg/kg	1	01/21/19	01/22/19 GT	SW846 6010D 1	SW846 3050B <sup>2</sup>
Thallium	< 1.1	1.1	mg/kg	1	01/21/19	01/22/19 GT	SW846 6010D 1	SW846 3050B <sup>2</sup>
Vanadium	24.5	5.7	mg/kg	1	01/21/19	01/22/19 GT	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA46022

(2) Prep QC Batch: MP12179



4.3 **4** 



Client Sample ID: Lab Sample ID: Matrix: Project:	): 107-M028E2         JC81644-4A         SO - Soil         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, Trivaler	nt <sup>a</sup>	16.1	1.6	mg/kg	1	01/22/19 16:44	RI	SW846 6010/7196A M			







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<u> </u>	FB		2235 TEL, 732	Route 130, 2-329-0200	Dayton, FAX	NJ 088	310 -3499				F	ED-EX T	racking	9				Bottle	Kont		z 10!	8-211
				www.sgs.	com/ehs	usa					٤	GS Quot	le #					SGS Jo	6# <u></u>	20.	810	81
Client / Reporting Information	Project Name	A Received	Project	Informatio	n			88.3 1			教室委員	<u> </u>	Req	ested	Anal	ysis (	see T	EST C	ODE s	heet)		Matrix Codes
Company Name	Project Name:											ļ		1				ļ				DW - Detection Minus
Arcadis	7	PG Sik	107	Jea	in	Cut	r						5									GW - Ground Water
Street Address	Street						ALC: NO						- ŢŢ	2								WW - Water SW - Surface Water
10 Friends Lane Juike 200	18 (	Chapel A	venue	Billing Info	rmation (	if differer	nt from F	Report	t to)			2	5	-								SO - Soil
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Project Contact E-mail	Project #	run	NJ_	Street Addre	155					-		ŝ	ປ	9								OI - Oil LIQ - Other Liquid
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646.762.5629												9	-2	S	š	~	Įξ	5		-		FB-Field Blank EB-Equipment Blank
Sampler(s) Name(s) Phone #	Project Manager			Attention:								_	Š	7	ž	3		3				RB- Rinse Blank
Cynthic Buchanan, Chasha Cotollo	Jim M	chaughtin										E	<u>ک</u> ر	1	Ľ,	2	1	3				18-Trip Blank
Lab		Collec	lon	1			<u></u>	T	of preserv	ed bottles	1	10	¥	H	4	z	F	>				
Sample	MEDINE IN		-			# of		ğ	SSO4	HOL		'		1							- 1	
# Field ID / Point of Collection	MEOH/DI Vial #	Date	Time	Sampled by	Matrix	Dotties	Ξź	Ĩ	Ξž	5 2 0	,											LAB USE ONLY
FB(20190122)		1/22/19	1230	ec	Fß	2		1	1			X	X	X	X	X	X	X				D63
2 107-Mazaw		1/22/19	11 70	CB	SO				4			x	x	X	Χ	X	X	X				Ai8
BS - AIS		1/22/19	1155	CB	so	1			1			X	x	X	X	X	X	X				43
3 BS-AISMS		1/22/19	455	CB	so	1			L			X	χ	Х	X	X	X	X				
BS-AISMSD		1/22/19	1155	св	so	1			1			X	X	X	X	X	X	X				
4 107_M030E2		1/22/19	1200	CB	01	1			1			x	X	X	X	X	X	X				
5 BS- A165		1/22/19	1205	CB	50	1			1			x	X	X	Х	X	X	X				
6 DUP.02/20190122) RR		1/12/19		CB	50	1			1			X	X	x	х	x	X	X				
7 BS-ALLT		1122119	1245	CB	02	i			1			X	X	X	X	X	X	X				
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Tornaround Time ( additions only)	Approved by (S	GS Project Manage	r)/Date:		ommercia	I "A" (Lev	vel 1)			NYASP	Categor	уA			1000				5,000,000			
Std. 10 Business Days					ommercia	I "B" ( Le	vel 2)			NYASP	Categor	уВ										
5 Day RUSH				FI FI	JLLT1 (L	evel 3+4 )	)			State Fo	rms				1.0	TIAL	100		`	A	13	B
3 Day RUSH				N.	Reduced	i i			K.	EDD Fo	rmat _	Equit	<b>L</b>		-116	HAL	ASE	55M	ENT_	1	$\underline{C}$	
2 Day RUSH					ommercia	I "C"		_		Other		-'			1.60	271 1	/					
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Emergence & Bush T/A data susilable via Latitati				Commercial	A = Resi	and Only;	Comn	Barti-	Bow de	suits + Q ta	C Sumi	nary		Samo	e in	enter	view	rified	upor	receip	t in the	l aboratory
Emergency & Rush I/A data available via LabLink	8	ample Custody r	nust be docu	imented bel	ow each	time san	nples c	hang	e posse	ssion, i	ncludi	ng cou	rier d	elivery	entv	IΣ	57	a med		locelp		
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Form:SM088-03C (revised 2/12/18)

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

JC81681: Chain of Custody Page 1 of 4



5.2

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Client Sample ID:	FB(20190122)									
Lab Sample ID:	JC81681-1				Date Sampl	ed: 01	01/22/19			
Matrix:	AQ - Field Blank Soi	1	Date Receiv	ed: 01	01/22/19					
					Percent Soli	i <b>ds:</b> n/s	а			
Project:	PPG Site 107, 18 Cha	ty, NJ								
General Chemistry	7									
Analyte	Result	RL	Units	DF	Analyzed	By	Method			

Page 1 of 1

SW846 7196A ASTM D1498-76 SM4500H+ B-11 4.1 **4** 

Chromium, Hexavalent	< 0.010	0.010	mg/l	1	01/22/19 20:55 LS
Redox Potential Vs H2	266		mv	1	01/23/19 14:50 RB
pH <sup>a</sup>	5.33		su	1	01/22/19 15:40 SUB

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



Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		
		Percent Solids:	80.8
Matrix:	SO - Soil	Date Received:	01/22/19
Lab Sample ID:	JC81681-2	Date Sampled:	01/22/19
Client Sample ID:	107-M028W		

#### 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

### Page 1 of 1

4.2

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

### Page 1 of 1

4.3



Client Sample ID:	107-M030E2		
Lab Sample ID:	JC81681-4	Date Sampled:	01/22/19
Matrix:	SO - Soil	Date Received:	01/22/19
		<b>Percent Solids:</b>	75.3
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		
Conoral Chamistry			

#### General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	1.0 <b>J</b> -	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

### Page 1 of 1

4.4 **4** 

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

### Page 1 of 1

4.5



### SGS LabLink@1041356 11:39 03-Jun-2019

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		

# **Report of Analysis**

### **General Chemistry**

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	< 0.49 <mark>UJ</mark> -	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

### Page 1 of 1

4.6



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		
C1 Ch			

#### **General Chemistry**

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	0.99 <b>J</b> -	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

### Page 1 of 1

4.7 4



~		Repo	rt of An	alysis	Page 1 of 1
Client Sample ID: 10 Lab Sample ID: 10 Matrix: So	07-M028W 281681-2R O - Soil				<b>Date Sampled:</b> 01/22/19 <b>Date Received:</b> 01/22/19
Project: P	PG Site 107, 18 Chaj	pel Avenue	, Jersey Cit	y, NJ	Percent Solids: 80.8
Analyte	Result	RL	Units	DF	Analyzed By Method
Chromium, Hexavalen	t 0.70	0.50	mg/kg	1	01/25/19 17:35 DC SW846 3060A/7196A



4.1 4

			Repor	rt of An	alysis	Page 1 of 1
Client Sample ID:	BS-A15	38				Date Sampled: 01/22/19
Matrix:	SO - Soil					Date Banpied: 01/22/19 Date Received: 01/22/19 Percent Solids: 84 5
Project:	PPG Site	107, 18 C	hapel Avenue,	Jersey Cit	y, NJ	
General Chemistr	у					
Analyte		Result	RL	Units	DF	Analyzed By Method
Chromium, Hexava	alent	< 0.47	0.47	mg/kg	1	01/25/19 17:30 DC SW846 3060A/7196A



4.2 4

Result

0.76 J

1730

NEGATIVE

RL

0.20

120

Analyte

Iron, Ferrous

Sulfide Screen

Total Organic Carbon

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			

Units

mg/kg

%

DF

1

1

1

Analyzed

01/29/19

01/29/19 11:30 st

01/28/19 20:54 CD

## **Report of Analysis**

### Page 1 of 1

Method

ASTM D3872-86

SM4500S2- A-11

LLOYD KAHN 1988 MOD

By

ST

4.3



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	Report of Analysis							
Client Sample ID:	107-M030E2							
Lab Sample ID:	JC81681-4R				<b>Date Sampled:</b> 01/22/19			
Matrix:	SO - Soil				<b>Date Received:</b> 01/22/19			
					Percent Solids: 75.3			
Project:	PPG Site 107, 1	8 Chapel Avenu	e, Jersey Cit	y, NJ				
General Chemistr	y							
Analyte	Resu	lt RL	Units	DF	Analyzed By Method	1		
Chromium, Hexava	alent 0.56	0.53	mg/kg	1	01/25/19 17:35 DC SW846 3	060A/7196A		



4.4

	Report of Analysis									
Client Sample ID:	BS-A16S				Date Sampled: 01/22/19					
Matrix:	SO - Soil				Date Received: 01/22/19 Parcent Solids: 77.0					
Project:	PPG Site 107, 18 Cha	pel Avenue	. Jersey Cit	y, NJ	reicent sonus. 77.9					
General Chemistr	У									
Analyte	Result	RL	Units	DF	Analyzed By Method					
Chromium, Hexav	alent 0.76	0.51	mg/kg	1	01/25/19 17:35 DC SW846 3060A/7196A					



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_		перо		ary 515	1 age 1 of 1
Client Sample ID: DUP-(	)2(20190122)R	R			
Lab Sample ID: JC816	81-6R				<b>Date Sampled:</b> 01/22/19
Matrix: SO - S	oil				<b>Date Received:</b> 01/22/19
					Percent Solids: 81.8
Project: PPG S	ite 107, 18 Cha	pel Avenue	, Jersey Cit	y, 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

# **Report of Analysis**

Page 1 of 1

4.6



	Report of Analysis									
Client Sample ID:	BS-A16I					4				
Lab Sample ID:	JC81681-7R				<b>Date Sampled:</b> 01/22/19					
Matrix:	SO - Soil				<b>Date Received:</b> 01/22/19					
					Percent Solids: 86.0	4				
Project:	PPG Site 107, 18 Cha	apel Avenue	Jersey Cit	y, NJ						
General Chemistry	,									
Analyte	Result	RL	Units	DF	Analyzed By Method					
Chromium, Hexava	lent < 0.47	0.47	mg/kg	1	01/25/19 17:35 DC SW846 3060A/7196A					



### SGS LabLink@1041356 11:40 03-Jun-2019

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		

# **Report of Analysis**

### **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 <sup>1</sup>	SW846 3010A <sup>2</sup>
Chromium	< 10	10	ug/l	1	01/23/19	01/23/19 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>
Nickel	< 10	10	ug/l	1	01/23/19	01/23/19 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>
Thallium	< 10	10	ug/l	1	01/23/19	01/23/19 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>
Vanadium	< 50	50	ug/l	1	01/23/19	01/23/19 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA46026

(2) Prep QC Batch: MP12223



4



### SGS LabLink@1041356 11:40 03-Jun-2019

			-		•			-
Client Sample ID:	FB(20190	)122)						
Lab Sample ID:	JC81681-	1A				Date Sampled	: 01	/22/19
Matrix:	AQ - Fiel	d Blank Soil				Date Received	: 01	/22/19
						Percent Solids	: n/a	ı
Project:	PPG Site	107, 18 Chaj	pel Avenue,	Jersey Cit	y, NJ			
General Chemistry								
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivaler	nt <sup>a</sup>	< 0.020	0.020	mg/l	1	01/23/19 16:16	ND	SW846 6010/7196A M

## **Report of Analysis**

Page 1 of 1



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 <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	18.1	1.3	mg/kg	1	01/22/19	01/23/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	11.2	5.1	mg/kg	1	01/22/19	01/23/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>
Thallium	< 1.3	1.3	mg/kg	1	01/22/19	01/23/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>
Vanadium	28.2	6.3	mg/kg	1	01/22/19	01/23/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA46027

(2) Prep QC Batch: MP12220



4.2 4



Client Sample ID: Lab Sample ID: Matrix: Project:	107-M028W         JC81681-2A         SO - Soil         PPG Site 107, 18 Chapel Avenue, Jersey City, NJ    Date Sampled: 01/22/19 Percent Solids: 80.8									
General Chemistry										
Analyte		Result	RL	Units	DF	Analyzed	By	Method		
Chromium, Trivaler	nt <sup>a</sup>	17.7	1.8	mg/kg	1	01/23/19 22:25	ND	SW846 6010/7196A M		







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 <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	15.9	1.2	mg/kg	1	01/22/19	01/23/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	12.9	4.8	mg/kg	1	01/22/19	01/23/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Thallium	< 1.2	1.2	mg/kg	1	01/22/19	01/23/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Vanadium	25.9	6.0	mg/kg	1	01/22/19	01/23/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA46027

(2) Prep QC Batch: MP12220



4.3 **4** 



Client Sample ID:	BS-A15				•				
Lab Sample ID:	JC81681-	-3A				Date Sampled	: 01	/22/19	
Matrix:	SO - Soil <b>Date Received:</b> 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, Trivaler	nt <sup>a</sup>	15.5	1.7	mg/kg	1	01/23/19 21:16	ND	SW846 6010/7196A M	

Page 1 of 1

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

4.3



#### SGS LabLink@1041356 11:40 03-Jun-2019

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			

## **Report of Analysis**

**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 <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	19.0	1.4	mg/kg	1	01/22/19	01/23/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	14.0	5.5	mg/kg	1	01/22/19	01/23/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>
Thallium	< 1.4	1.4	mg/kg	1	01/22/19	01/23/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>
Vanadium	29.4	6.9	mg/kg	1	01/22/19	01/23/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA46027

(2) Prep QC Batch: MP12220



4.4 **4** 


Client Sample ID: Lab Sample ID: Matrix: Project:	107-M030 JC81681- SO - Soil PPG Site	0E2 4A 107, 18 Cha	apel Avenue,	Jersey Cit	y, NJ	Date Sampled Date Received Percent Solids	: 01 : 01 : 75	/22/19 /22/19 .3
General Chemistry								
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivaler	nt <sup>a</sup>	18.0	1.9	mg/kg	1	01/23/19 22:31	ND	SW846 6010/7196A M

Page 1 of 1

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



Client Sample ID:	BS-A16S		
Lab Sample ID:	JC81681-5A	Date Sampled:	01/22/19
Matrix:	SO - Soil	Date Received:	01/22/19
		<b>Percent Solids:</b>	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 <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	12.7	1.2	mg/kg	1	01/22/19	01/23/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	11.6	4.9	mg/kg	1	01/22/19	01/23/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>
Thallium	< 1.2	1.2	mg/kg	1	01/22/19	01/23/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>
Vanadium	18.6	6.1	mg/kg	1	01/22/19	01/23/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA46027

(2) Prep QC Batch: MP12220



4.5 **4** 



17 of 152

JC81681A

Client Sample ID: Lab Sample ID: Matrix: Project:	BS-A16S JC81681- SO - Soil PPG Site	5A 107, 18 Ch	apel Avenue,	Jersey Cit	y, NJ	Date Sampled Date Received Percent Solids	01 01 77	/22/19 /22/19 .9
General Chemistry								
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivaler	nt <sup>a</sup>	12.3	1.7	mg/kg	1	01/23/19 22:46	ND	SW846 6010/7196A M

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









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		

# **Report of Analysis**

**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 <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	19.6	1.2	mg/kg	1	01/22/19	01/23/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	11.6	4.8	mg/kg	1	01/22/19	01/23/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Thallium <sup>a</sup>	< 2.4	2.4	mg/kg	2	01/22/19	01/23/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Vanadium	35.5	6.0	mg/kg	1	01/22/19	01/23/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA46027

(2) Prep QC Batch: MP12220

(a) Elevated detection limit due to dilution required for high interfering element.

Page 1 of 1





Client Sample ID: Lab Sample ID: Matrix: Project:	DUP-02(2 JC81681- SO - Soil PPG Site	20190122)RR 6A 107, 18 Chaj	bel Avenue,	Jersey Cit	Date Sampled:01/22/19Date Received:01/22/19Percent Solids:81.8			
General Chemistry								
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivaler	nt <sup>a</sup>	19.1	1.7	mg/kg	1	01/23/19 22:52	ND	SW846 6010/7196A M

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

Page 1 of 1





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 <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	13.3	1.2	mg/kg	1	01/22/19	01/23/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	11.7	4.7	mg/kg	1	01/22/19	01/23/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>
Thallium	< 1.2	1.2	mg/kg	1	01/22/19	01/23/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>
Vanadium	20.1	5.8	mg/kg	1	01/22/19	01/23/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA46027

(2) Prep QC Batch: MP12220



4.7 4



21 of 152

JC81681A

Client Sample ID: Lab Sample ID: Matrix: Project:	BS-A16I JC81681- SO - Soil PPG Site	7A 107, 18 Ch	apel Avenue,	Jersey City	y, NJ	Date Sampled: Date Received Percent Solids	01 01 86	/22/19 /22/19 .0
General Chemistry								
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivaler	nt <sup>a</sup>	12.3	1.7	mg/kg	1	01/23/19 22:57	ND	SW846 6010/7196A M

Page 1 of 1

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







**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:

0.7.0			<b>N</b> - 4 - 1 - 1	Sample			Analysis	;
SDG	Sample ID	Lab ID	Matrix	Collection Date	Parent Sample	Cr VI	MET	MISC
	FB(20190123)	JC81743-1	Water	1/23/2019		Х	Х	Х
	SW-A0 (8.0-8.5)	JC81743-2	Soil	1/23/2019		х	х	х
	BS-A0T	JC81743-3	Soil	1/23/2019		х	х	х
	BS-A1T	JC81743-4	Soil	1/23/2019		х	х	х
	BS-A2T	JC81743-5	Soil	1/23/2019		х	Х	х
	BS-A1	JC81743-6	Soil	1/23/2019		х	Х	х
1004740	BS-A2	JC81743-7	Soil	1/23/2019		х	х	х
JC81743	SW-A11 (8.0-8.5)	JC81743-8	Soil	1/23/2019		х	х	х
	SW-A10 (8.0-8.5)	JC81743-9	Soil	1/23/2019		Х	х	х
	SW-A11 (6.0-6.5)	JC81743-10	Soil	1/23/2019		Х	х	х
	SW-A10 (6.0-6.5)	JC81742-11	Soil	1/23/2019		Х	х	х
	BS-A3D	JC81743-12	Soil	1/23/2019		Х	х	х
	BS-A3S	JC81743-13	Soil	1/23/2019		Х	х	х
	BS-A3T	JC81743-14	Soil	1/23/2019		Х	х	х
	FB(20190125)	JC81864-1	Water	1/25/2019		Х	Х	х
	BS-A18	JC81864-2	Soil	1/25/2019		x	х	х
	BS-A19	JC81864-3	Soil	1/25/2019		х	Х	х
	BS-A17	JC81864-4	Soil	1/25/2019		х	Х	Х
JC81864	108_M016_1	JC81864-5	Soil	1/25/2019		х	х	х
	107_M034N	JC81864-6	Soil	1/25/2019		х	Х	х
	108_M018N_1	JC81864-7	Soil	1/25/2019		Х	Х	Х
	108_M018N	JC81864-8	Soil	1/25/2019		Х	Х	х

Notes:

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

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- 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.

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

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	
	Water	180 days from collection to analysis	Preserved to a pH of less than 2; Cool to <6°C	
SW-846 6010C	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
	Non-detect	UJ-
MS/MSD percent recovery 30% to 74%	Detect	J-
No/No5	Non-detect	R
MS/MSD percent recovery < 30%	Detect	J-
	Non-detect	No Action
MS/MSD percent recovery > 125%	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  $\pm$  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		orted	Performance Acceptable		Not
	No	Yes	No	Yes	Required
Inductively Coupled Plasma-Atomic Emission Spectrometer	ry (ICP-AE	S)			
Tier II Validation			-		
Holding Times		x		x	
Reporting limits (units)		x		x	
Blanks					
A. Instrument Blanks		Х		x	
B. Method Blanks		x		x	
C. Equipment/Field Blanks		x		x	
Laboratory Control Sample (LCS)		x		х	
Laboratory Control Sample Duplicate (LCSD)	Х				Х
LCS/LCSD Precision (RPD)	Х				Х
Matrix Spike (MS) %R		x	х		
Matrix Spike Duplicate (MSD) %R		Х	х		
MS/MSD Precision (RPD)		x		х	
Field/Lab Duplicate (RPD)		Х		X	
ICP Serial Dilution %D		x		х	
Total vs. Dissolved	Х				Х
Reporting Limit Verification		x		X	
Tier III Validation	·				
Initial Calibration Verification		x		x	
Continuing Calibration Verification		x		х	
CRDL Standard Recovery		x		X	
ICP Interference Check		x		X	
ICP-MS Internal Standards	Х				Х
Transcription/calculations acceptable		Х		Х	
Raw Data	Х				Х
Reporting limits adjusted to reflect sample dilutions		Х		Х	
Notes:					

%R Percent recovery

RPD Relative percent difference

%D Percent difference

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#### 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.

<u>SDG #JC81743</u>: 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.

<u>SDG #JC81864</u>: The MS analysis performed on sample location BS-A18 in association with the insoluble hexavalent chromium analysis exhibited recoveries within the control limits.

<u>SDG #JC81864</u>: 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 <sup>1</sup>
	Non-detect	UJ-
Spike recovery ≥ 50% but < 75%	Detect	J-
	Non-detect	R
Spike recovery < 50%	Detect	R
Spike recovery > 125%	Non-detect	No Action
Spike recovery > 125% but ≤ 150%	Detect	+L
Spike recovery > 150%	Detect	R

Notes:

<sup>1</sup> 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.

<u>SDG #JC81864</u>: 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  $\pm$  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.

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

## DATA VALIDATION CHECKLIST FOR HEXAVALENT CHROMIUM

%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	SW846 9045D	Analysis: 2 days	< 24 hours of receipt by laboratory
107_M034N			
108_M018N_1			
108_M018N			

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

	Qualification			
Criteria	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	Reported		Performance Acceptable		Not Required
9045D, ASTM D1498-76	No	Yes	No	Yes	Required
Miscellaneous Instrumentation					
Tier II Validation					
Holding times		x	x		
Reporting limits (units)		x		x	
Blanks					
A. Instrument Blanks	х				Х
B. Method blanks	х				Х
C. Equipment blanks	x				Х
Laboratory Control Sample (LCS) %R	Х				Х
Laboratory Control Sample Duplicate (LCSD) %R	Х				Х
LCS/LCSD Precision (RPD)	х				Х
Matrix Spike (MS) %R	Х				Х
Matrix Spike Duplicate (MSD) %R	Х				Х
MS/MSD Precision (RPD)	Х				Х
Field/Lab Duplicate (RPD)		Х		Х	
Dilution Factor		Х		Х	
Tier III Validation					
Initial calibration %RSD or correlation coefficient	Х				Х
Continuing calibration %R	х				Х
Raw Data		Х		х	
Transcription/calculation errors present		х		х	
Reporting limits adjusted to reflect sample dilutions		x		x	
Notes:			1		

%R Percent recovery

RPD Relative percent difference

VALIDATION PERFORMED BY: Jennifer Singer

SIGNATURE:

Annifer Alinger

DATE: June 5, 2019

PEER REVIEW: Dennis Capria

DATE: June 27, 2019

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# CHAIN OF CUSTODY CORRECTED SAMPLE ANALYSIS DATA SHEETS



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JC81743: Chain of Custody Page 1 of 5



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JC81743: Chain of Custody Page 2 of 5



5.2

сл

< 0.010

330

5.70

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

Chromium, Hexavalent

Redox Potential Vs H2

pH <sup>a</sup>

Client Sample ID:	FB (20190123)							
Lab Sample ID:	JC81743-1				Date Sample	ed: 01	/23/19	
Matrix:	AQ - Field Blank Soil	l			Date Receiv	ed: 01	/23/19	
Project:	PPG Site 107, 18 Cha	apel Avenue	e, Jersey Ci	ty, NJ	Percent Soli	i <b>ds:</b> n/	a	
General Chemistry	7							
Analyte	Result	RL	Units	DF	Analyzed	By	Method	

mg/l

mv

su

1

1

1

01/23/19 22:28 LS

01/24/19 10:20 RI

 $01/23/19 \ 16{:}20 \ \text{SUB} \ \text{SM4500H+ B-11}$ 

0.010

# **Report of Analysis**

Page 1 of 1

SW846 7196A

ASTM D1498-76

4-1



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
		<b>Percent Solids:</b>	72.4
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

# **Report of Analysis**

#### **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

#### Page 1 of 1

4.2





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

#### Page 1 of 1

4.3



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

#### Page 1 of 1

4.4



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		
	PPG Sile 107, 18 Chaper 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

#### Page 1 of 1

4.5



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		

# **Report of Analysis**

#### **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

#### Page 1 of 1

4.6



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		

# **Report of Analysis**

#### **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

#### Page 1 of 1

4.7



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		
-	· · ·		

# **Report of Analysis**

#### **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

#### Page 1 of 1

4.8


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			

# **Report of Analysis**

#### **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

#### Page 1 of 1

4.9



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		

# **Report of Analysis**

#### **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

#### Page 1 of 1

4.10 **4** 



	- • •		
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		
		Percent Solids:	88.4
Matrix:	SO - Soil	Date Received:	01/23/19
Lab Sample ID:	JC81743-11	Date Sampled:	01/23/19
Client Sample ID:	SW-A10 (6.0-6.5)		

# **Report of Analysis**

#### **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

#### Page 1 of 1

4.11 **4** 



Lab Sample ID:         JC81743-12         Date Sampled:         01/23/19           Matrix:         SO - Soil         Date Received:         01/23/19           Percent Solids:         81.2	Client Sample ID:	BS-A3D			
Matrix:         SO - Soil         Date Received:         01/23/19           Percent Solids:         81.2	Lab Sample ID:	JC81743-12	Date Sampled:	01/23/19	
Percent Solids: 81.2	Matrix:	SO - Soil	Date Received:	01/23/19	
			Percent Solids:	81.2	
Project: PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	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

#### Page 1 of 1

4.12



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

#### Page 1 of 1

23 of 76

JC81743



4.13

Client Sample ID:	BS-A3T		
Lab Sample ID:	JC81743-14	Date Sampled:	01/23/19
Matrix:	SO - Soil	<b>Date Received:</b>	01/23/19
		<b>Percent Solids:</b>	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

#### Page 1 of 1

4.14 4



JC81743

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		

# **Report of Analysis**

**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 <sup>1</sup>	SW846 3010A <sup>2</sup>
Chromium	< 10	10	ug/l	1	01/23/19	01/24/19 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>
Nickel	< 10	10	ug/l	1	01/23/19	01/24/19 ND	SW846 6010D 1	SW846 3010A <sup>2</sup>
Thallium	< 10	10	ug/l	1	01/23/19	01/24/19 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>
Vanadium	< 50	50	ug/l	1	01/23/19	01/24/19 ND	SW846 6010D 1	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA46035

(2) Prep QC Batch: MP12239



4



Client Sample ID: Lab Sample ID: Matrix: Project:	: FB (20190123) JC81743-1A AQ - Field Blank SoilDate Sampled:01/23/19 Date Received:01/23/19 Percent Solids:PPG Site 107, 18 Chapel Avenue, Jersey City, NJn/a								
General Chemistry	,								
Analyte		Result	RL	Units	DF	Analyzed	By	Method	
Chromium, Trivaler	nt <sup>a</sup>	< 0.020	0.020	mg/l	1	01/24/19 21:41	ND	SW846 6010/7196A M	

#### **Report of Analysis**

Page 1 of 1



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
		<b>Percent Solids:</b>	72.4
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

# **Report of Analysis**

#### **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 <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	26.0	1.3	mg/kg	1	01/23/19	01/24/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	44.1	5.3	mg/kg	1	01/23/19	01/24/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>
Thallium	< 1.3	1.3	mg/kg	1	01/23/19	01/24/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>
Vanadium	30.6	6.6	mg/kg	1	01/23/19	01/24/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA46034

(2) Prep QC Batch: MP12248



4.2



Client Sample ID: Lab Sample ID: Matrix: Project:	SW-A0 (8 JC81743- SO - Soil PPG Site	3.0-8.5) 2A 107, 18 Chaj	pel Avenue,	Date Sampled: Date Received Percent Solids	01. 01. 72	/23/19 /23/19 .4		
General Chemistry	,							
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivaler	nt <sup>a</sup>	25.2	1.9	mg/kg	1	01/25/19 13:46	DC	SW846 6010/7196A M

Page 1 of 1





Client Sample ID:	BS-A0T		
Lab Sample ID:	JC81743-3A	Date Sampled:	01/23/19
Matrix:	SO - Soil	Date Received:	01/23/19
		<b>Percent Solids:</b>	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 <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	16.2	1.1	mg/kg	1	01/23/19	01/24/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	12.8	4.6	mg/kg	1	01/23/19	01/24/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Thallium	< 1.1	1.1	mg/kg	1	01/23/19	01/24/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Vanadium	23.6	5.7	mg/kg	1	01/23/19	01/24/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA46034

(2) Prep QC Batch: MP12248



4.3 **4** 



17 of 181

JC81743A

Client Sample ID: Lab Sample ID: Matrix: Project:	BS-A0T JC81743-3A SO - Soil PPG Site 107, 18 Chapel Avenue, Jersey City, NJ							/23/19 /23/19 .0
General Chemistry	,							
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivaler	nt <sup>a</sup>	15.6	1.6	mg/kg	1	01/25/19 13:46	DC	SW846 6010/7196A M

Page 1 of 1

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





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 <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	16.8	1.4	mg/kg	1	01/23/19	01/24/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	15.7	5.4	mg/kg	1	01/23/19	01/24/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>
Thallium	< 1.4	1.4	mg/kg	1	01/23/19	01/24/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>
Vanadium	26.7	6.8	mg/kg	1	01/23/19	01/24/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA46034

(2) Prep QC Batch: MP12248



4.4 **4** 



JC81743A

Client Sample ID: Lab Sample ID: Matrix: Project:	BS-A1T JC81743-4ADate Sampled:01/23/19 01/23/19SO - SoilDate Received:01/23/19 Percent Solids:PPG Site 107, 18 Chapel Avenue, Jersey City, NJ71.6								
General Chemistry									
Analyte		Result	RL	Units	DF	Analyzed	By	Method	
Chromium, Trivaler	nt <sup>a</sup>	15.5	2.0	mg/kg	1	01/25/19 13:46	DC	SW846 6010/7196A M	

Page 1 of 1





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 <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	15.6	1.1	mg/kg	1	01/23/19	01/24/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	11.8	4.4	mg/kg	1	01/23/19	01/24/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>
Thallium	< 1.1	1.1	mg/kg	1	01/23/19	01/24/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Vanadium	23.5	5.5	mg/kg	1	01/23/19	01/24/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA46034

(2) Prep QC Batch: MP12248



4.5 **4** 



21 of 181

JC81743A

Client Sample ID: Lab Sample ID: Matrix: Project:	BS-A2T JC81743-5ADate Sampled: 01/23/19 Date Received: 01/23/19 Percent Solids: 88.2PPG Site 107, 18 Chapel Avenue, Jersey City, NJ									
General Chemistry										
Analyte		Result	RL	Units	DF	Analyzed	By	Method		
Chromium, Trivaler	nt <sup>a</sup>	15.6	1.6	mg/kg	1	01/25/19 13:46	DC	SW846 6010/7196A M		

Page 1 of 1





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		

# **Report of Analysis**

**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 <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	22.3	1.2	mg/kg	1	01/23/19	01/24/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	19.8	4.7	mg/kg	1	01/23/19	01/24/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>
Thallium	< 1.2	1.2	mg/kg	1	01/23/19	01/24/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>
Vanadium	25.1	5.9	mg/kg	1	01/23/19	01/24/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA46034

(2) Prep QC Batch: MP12248



4.6 **4** 



Client Sample ID: Lab Sample ID: Matrix: Project:	BS-A1 JC81743-6ADate Sampled:01/23/19SO - SoilDate Received:01/23/19PPG Site 107, 18 Chapel Avenue, Jersey City, NJPercent Solids:89.9									
General Chemistry										
Analyte		Result	RL	Units	DF	Analyzed	By	Method		
Chromium, Trivaler	nt <sup>a</sup>	21.7	1.6	mg/kg	1	01/25/19 13:46	DC	SW846 6010/7196A M		

Page 1 of 1

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





Client Sample ID:	BS-A2		
Lab Sample ID:	JC81743-7A	Date Sampled:	01/23/19
Matrix:	SO - Soil	Date Received:	01/23/19
		<b>Percent Solids:</b>	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 <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	17.3	1.1	mg/kg	1	01/23/19	01/24/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	12.7	4.4	mg/kg	1	01/23/19	01/24/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>
Thallium	< 1.1	1.1	mg/kg	1	01/23/19	01/24/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>
Vanadium	22.9	5.5	mg/kg	1	01/23/19	01/24/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA46034

(2) Prep QC Batch: MP12248



4.7 4



Client Sample ID: Lab Sample ID: Matrix:	BS-A2 JC81743- SO - Soil	-7A				Date Sampled Date Received Percent Solids	: 01 : 01 : 90	/23/19 /23/19 .3		
Project:	PPG Site	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ								
General Chemistry										
Analyte		Result	RL	Units	DF	Analyzed	By	Method		
Chromium, Trivaler	nt <sup>a</sup>	16.9	1.5	mg/kg	1	01/25/19 13:46	DC	SW846 6010/7196A M		







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		

# **Report of Analysis**

#### **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 <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	21.8	1.1	mg/kg	1	01/23/19	01/24/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	16.4	4.5	mg/kg	1	01/23/19	01/24/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Thallium	< 1.1	1.1	mg/kg	1	01/23/19	01/24/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Vanadium	32.1	5.6	mg/kg	1	01/23/19	01/24/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA46034

(2) Prep QC Batch: MP12248







Client Sample ID: Lab Sample ID: Matrix: Project:	SW-A11 JC81743- SO - Soil PPG Site	(8.0-8.5) 8A 107, 18 Chaj	01/ 01/ 84	/23/19 /23/19 .6				
General Chemistry	,							
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivaler	nt <sup>a</sup>	20.9	1.6	mg/kg	1	01/25/19 13:46	DC	SW846 6010/7196A M

Page 1 of 1

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



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		

# **Report of Analysis**

**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 <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	15.6	1.1	mg/kg	1	01/23/19	01/24/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	14.2	4.3	mg/kg	1	01/23/19	01/24/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>
Thallium	< 1.1	1.1	mg/kg	1	01/23/19	01/24/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>
Vanadium	20.9	5.4	mg/kg	1	01/23/19	01/24/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA46034

(2) Prep QC Batch: MP12248



4.9 **4** 





Client Sample ID: Lab Sample ID: Matrix: Project:	SW-A10 (8.0-8.5)         JC81743-9A         SO - Soil         Date Sampled:       01/23/19         Date Received:       01/23/19         PPG Site 107, 18 Chapel Avenue, Jersey City, NJ							
General Chemistry								
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivaler	nt <sup>a</sup>	15.1	1.6	mg/kg	1	01/25/19 13:46	DC	SW846 6010/7196A M







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		

# **Report of Analysis**

**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 <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	17.0	1.1	mg/kg	1	01/23/19	01/24/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	14.1	4.5	mg/kg	1	01/23/19	01/24/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Thallium	< 1.1	1.1	mg/kg	1	01/23/19	01/24/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Vanadium	27.6	5.7	mg/kg	1	01/23/19	01/24/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA46034

(2) Prep QC Batch: MP12248







Client Sample ID: Lab Sample ID: Matrix:	SW-A11 JC81743- SO - Soil	(6.0-6.5) -10A				Date Sampled Date Received	: 01 : 01	/23/19 /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, Trivaler	nt <sup>a</sup>	17.0	1.6	mg/kg	1	01/25/19 13:46	DC	SW846 6010/7196A M	

Page 1 of 1

4.10 4





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
		<b>Percent Solids:</b>	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 <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	17.3	1.2	mg/kg	1	01/23/19	01/24/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	14.8	4.6	mg/kg	1	01/23/19	01/24/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>
Thallium	< 1.2	1.2	mg/kg	1	01/23/19	01/24/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Vanadium	23.6	5.8	mg/kg	1	01/23/19	01/24/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA46034

(2) Prep QC Batch: MP12248







Client Sample ID: Lab Sample ID: Matrix: Project:	SW-A10 (6.0-6.5)       JC81743-11A       Date Sampled: 01/23/19         SO - Soil       Date Received: 01/23/19         PPG Site 107, 18 Chapel Avenue, Jersey City, NJ       Percent Solids: 88.4							
General Chemistry	,							
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivaler	nt <sup>a</sup>	17.3	1.7	mg/kg	1	01/25/19 13:46	DC	SW846 6010/7196A M

Page 1 of 1





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 <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	66.4	1.3	mg/kg	1	01/23/19	01/24/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	24.7	5.0	mg/kg	1	01/23/19	01/24/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>
Thallium	< 1.3	1.3	mg/kg	1	01/23/19	01/24/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Vanadium	31.3	6.3	mg/kg	1	01/23/19	01/24/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA46034

(2) Prep QC Batch: MP12248



4.12 4



			Rep	oort of A	nalysis			Page 1 of 1
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 Ch	apel Aver	ue, Jersey C	ity, NJ			
General Chemistry	7							
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivaler	nt <sup>a</sup>	65.6	1.8	mg/kg	1	01/25/19 13:48	DC	SW846 6010/7196A M







Client Sample ID:	BS-A3S		
Lab Sample ID:	JC81743-13A	Date Sampled:	01/23/19
Matrix:	SO - Soil	Date Received:	01/23/19
		<b>Percent Solids:</b>	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 <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	69.5	1.2	mg/kg	1	01/23/19	01/24/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	12.6	4.7	mg/kg	1	01/23/19	01/24/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Thallium	< 1.2	1.2	mg/kg	1	01/23/19	01/24/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Vanadium	22.7	5.9	mg/kg	1	01/23/19	01/24/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA46034

(2) Prep QC Batch: MP12248







<b>Report of Analysis</b>												
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	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ										
General Chemistry	7											
Analyte		Result	RL	Units	DF	Analyzed	By	Method				
Chromium, Trivaler	nt <sup>a</sup>	66.9	1.7	mg/kg	1	01/25/19 13:48	DC	SW846 6010/7196A M				

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

#### Page 1 of 1

4.13 4



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 <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	25.9	1.1	mg/kg	1	01/23/19	01/24/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	16.5	4.4	mg/kg	1	01/23/19	01/24/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>
Thallium	< 1.1	1.1	mg/kg	1	01/23/19	01/24/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>
Vanadium	23.1	5.5	mg/kg	1	01/23/19	01/24/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA46034

(2) Prep QC Batch: MP12248







Client Sample ID: Lab Sample ID:	BS-A3T JC81743-	-14A				Date Sampled	: 01	/23/19				
Matrix:	SO - Soil         Date Received:         01/23/19											
Project:	Percent Solids: 90.6 PPG Site 107, 18 Chapel Avenue, Jersey City, NJ											
General Chemistry	General Chemistry											
Analyte		Result	RL	Units	DF	Analyzed	By	Method				
Chromium, Trivaler	nt <sup>a</sup>	25.3	1.5	mg/kg	1	01/25/19 13:38	DC	SW846 6010/7196A M				







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

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

JC81864: Chain of Custody Page 1 of 3



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Matrix: Project:	AQ - Field Blank S PPG Site 107, 18 C	loil Chapel Avenu	e, Jersey Cit	ty, NJ	Date Received: Percent Solids:	01/25/19 n/a	
General Chemistry	,						

Page 1 of 1

4.1 **4** 

Analyte	Result	KL	Units	DF	Analyzed	Ву	Method
Chromium, Hexavalent Redox Potential Vs H2 pH <sup>a</sup>	< 0.010 372 5.36	0.010	mg/l mv su	1 1 1	01/25/19 18:28 01/27/19 15:10 01/25/19 16:36	DC RB SUB	SW846 7196A ASTM D1498-76 SM4500H+ B-11

(a) Sample received out of holding time for pH 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

#### Page 1 of 1

4.2



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

#### Page 1 of 1

4.3



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

#### Page 1 of 1

4.4



Client Sample ID:	108_M016_1		
Lab Sample ID:	JC81864-5	Date Sampled:	01/25/19
Matrix:	SO - Soil	Date Received:	01/25/19
		<b>Percent Solids:</b>	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	01.10	my	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
рН	7.97 J		su	1	01/27/19 10:17	RB	SW846 9045D

#### Page 1 of 1

4.5



Lab Sample ID:JC81864-6Date Sampled:01/2Date Sampled:01/201/201/2	1/25/19
	11 401 17
<b>Matrix:</b> $SO = SOI$ <b>Date Received:</b> $01/2$	01/25/19
Percent Solids: 87.	37.3
Project:PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

#### **General Chemistry**

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium Hovevelent	0.73	0.46	ma/ka	1	01/28/19 15:02	DC	SW846 3060 A /7196 A
Redox Potential Vs H2	302	0.10	my	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

#### Page 1 of 1

4.6

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



4.7



Client Sample ID:	108_M018N		
Lab Sample ID:	JC81864-8	Date Sampled:	01/25/19
Matrix:	SO - Soil	Date Received:	01/25/19
		<b>Percent Solids:</b>	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

#### Page 1 of 1

4.8



Client Sample ID: Lab Sample ID: Matrix: Project:	BS-A18 JC81864- SO - Soil PPG Site	2R 107, 18 Cha	npel Avenue,	Jersey Cit	y, NJ	Date Sampled Date Received Percent Solids	: 01 : 01 : 88	/25/19 /25/19 .1
General Chemistry								
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexava	lent	1.3	0.45	mg/kg	1	01/31/19 13:27	DC	SW846 3060A/7196A

Page 1 of 1

44



Client Sample ID: Lab Sample ID: Matrix: Project:	BS-A19 JC81864- SO - Soil PPG Site	-3R 107, 18 Cha	pel Avenue,	Jersey Cit	y, NJ	Date Sampled Date Received Percent Solids	: 01 : 01 : 87	/25/19 /25/19 .1
General Chemistry								
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexava	lent	< 0.46	0.46	mg/kg	1	01/31/19 13:32	DC	SW846 3060A/7196A

Page 1 of 1

Client Sample ID: Lab Sample ID: Matrix: Project:	BS-A17 JC81864- SO - Soil PPG Site	-4R 107, 18 Cha	apel Avenue,	Jersey Cit	y, NJ	Date Sampled Date Received Percent Solids	: 01 : 01 : 79	/25/19 /25/19 .0
General Chemistry								
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexava	lent	0.64	0.51	mg/kg	1	01/31/19 13:32	DC	SW846 3060A/7196A

Page 1 of 1

Client Sample ID: Lab Sample ID: Matrix: Project:	108_M01 JC81864- SO - Soil PPG Site	6_1 -5R 107, 18 Cha	apel Avenue,	Jersey Cit	y, NJ	Date Sampled Date Received Percent Solids	: 01 : 01 : 83	/25/19 /25/19 .9
General Chemistry	7							
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexava	lent	1.3	0.48	mg/kg	1	01/31/19 13:32	DC	SW846 3060A/7196A

Page 1 of 1



Client Sample ID: Lab Sample ID: Matrix: Project:	107_M03 JC81864- SO - Soil PPG Site	4N 6R 107, 18 Cha	pel Avenue,	Jersey Cit	y, NJ	Date Sampled Date Received Percent Solids	: 01 : 01 : 87	/25/19 /25/19 .3
General Chemistry	,							
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexava	lent	< 0.46	0.46	mg/kg	1	01/31/19 13:32	DC	SW846 3060A/7196A

Page 1 of 1



Client Sample ID: Lab Sample ID: Matrix: Project:	108_M01 JC81864- SO - Soil PPG Site	8N_1 7R 107, 18 Cha	ipel Avenue,	Jersey Cit	Date Sampled Date Received Percent Solids	: 01 : 01 : 90	/25/19 /25/19 .3	
General Chemistry	7							
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexava	lent	2.3	0.44	mg/kg	1	01/31/19 13:32	DC	SW846 3060A/7196A

Page 1 of 1



Client Sample ID: Lab Sample ID: Matrix: Project:	108_M01 JC81864- SO - Soil PPG Site	8N 8R 107, 18 Cha	apel Avenue,	Date Sampled Date Received Percent Solids	: 01 : 01 : 87	/25/19 /25/19 .6		
General Chemistry	,							
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexava	lent	6.1	0.46	mg/kg	1	01/31/19 13:32	DC	SW846 3060A/7196A

Page 1 of 1



#### SGS LabLink@1041356 11:42 03-Jun-2019

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		

# **Report of Analysis**

#### **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 рр	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>
Chromium	< 10	10	ug/l	1	01/26/19	01/28/19 pp	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>
Nickel	< 10	10	ug/l	1	01/26/19	01/28/19 pp	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>
Thallium	< 10	10	ug/l	1	01/26/19	01/28/19 pp	SW846 6010D 1	SW846 3010A <sup>2</sup>
Vanadium	< 50	50	ug/l	1	01/26/19	01/28/19 pp	SW846 6010D 1	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA46051

(2) Prep QC Batch: MP12282







#### SGS LabLink@1041356 11:42 03-Jun-2019

Client Sample ID: Lab Sample ID:	FB(20190 JC81864-	)125) 1A				Date Sampled	: 01	/25/19			
Matrix:	AQ - Fiel	AQ - Field Blank Soil Date Received: 01/25/19									
Project:	PPG Site	PG Site 107, 18 Chapel Avenue, Jersey City, NJ									
General Chemistry								,			
Analyte		Result	RL	Units	DF	Analyzed	By	Method			
Chromium, Trivaler	nt <sup>a</sup>	< 0.020	0.020	mg/l	1	01/28/19 10:45	PP	SW846 6010/7196A M			

### **Report of Analysis**

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





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 <sup>a</sup>	< 4.5 UJ-	4.5	mg/kg	2	01/25/19	01/28/19 pp	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	33.3	1.1	mg/kg	1	01/25/19	01/28/19 рр	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	18.1	4.5	mg/kg	1	01/25/19	01/28/19 pp	SW846 6010D 1	SW846 3050B <sup>2</sup>
Thallium	< 1.1	1.1	mg/kg	1	01/25/19	01/28/19 рр	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Vanadium	50.9	5.7	mg/kg	1	01/25/19	01/28/19 pp	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA46051

(2) Prep QC Batch: MP12281

(a) Elevated detection limit due to dilution required for high interfering element.

Page 1 of 1





Client Sample ID:	BS-A18								
Lab Sample ID:	JC81864	-2A				Date Sampled	: 01	/25/19	
Matrix:	SO - Soil	l				<b>Date Received:</b> 01/25/19			
						Percent Solids	: 88	3.1	
Project:	PPG Site	107, 18 Chap	el Avenue	e, Jersey Cit	y, NJ				
General Chemistry	,								
Analyte		Result	RL	Units	DF	Analyzed	By	Method	
Chromium, Trivaler	nt <sup>a</sup>	<del>32.4</del> 32.0	1.6	mg/kg	1	01/28/19 14:58	DC	SW846 6010/7196A M	

Page 1 of 1

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





Client Sample ID:	BS-A19		
Lab Sample ID:	JC81864-3A	Date Sampled:	01/25/19
Matrix:	SO - Soil	Date Received:	01/25/19
		<b>Percent Solids:</b>	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 <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	18.0	1.2	mg/kg	1	01/25/19	01/28/19 рр	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	14.9	4.6	mg/kg	1	01/25/19	01/28/19 рр	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Thallium	< 1.2	1.2	mg/kg	1	01/25/19	01/28/19 PP	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Vanadium	30.4	5.8	mg/kg	1	01/25/19	01/28/19 рр	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA46051

(2) Prep QC Batch: MP12281



4.3 **4** 



	79.110									
Client Sample ID:	BS-A19									
Lab Sample ID:	JC81864	-3A				Date Sampled	: 01	/25/19		
Matrix:	SO - Soil	<b>SO</b> - Soil <b>Date Received:</b> 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, Trivale	nt <sup>a</sup>	$\frac{17.4}{18.0}$	1.7	mg/kg	1	01/28/19 15:02	DC	SW846 6010/7196A M		

Page 1 of 1

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





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 <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	13.8	1.2	mg/kg	1	01/25/19	01/28/19 рр	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	13.1	4.9	mg/kg	1	01/25/19	01/28/19 рр	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Thallium	< 1.2	1.2	mg/kg	1	01/25/19	01/28/19 PP	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Vanadium	22.2	6.1	mg/kg	1	01/25/19	01/28/19 pp	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA46051

(2) Prep QC Batch: MP12281





Client Sample ID:	BS-A17								
Lab Sample ID:	JC81864	-4A				Date Sampled	: 01	/25/19	
Matrix:	SO - Soi					<b>Date Received:</b> 01/25/19			
						Percent Solids	: 79	0.0	
Project:	PPG Site	107, 18 Chap	el Avenue	e, Jersey Cit	y, NJ				
General Chemistry	,								
Analyte		Result	RL	Units	DF	Analyzed	By	Method	
Chromium, Trivaler	nt <sup>a</sup>	<del>-13.8</del> 13.2	1.7	mg/kg	1	01/28/19 15:02	DC	SW846 6010/7196A M	

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

Page 1 of 1



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 <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	37.4	1.2	mg/kg	1	01/25/19	01/28/19 рр	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	16.5	4.8	mg/kg	1	01/25/19	01/28/19 рр	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Thallium	< 1.2	1.2	mg/kg	1	01/25/19	01/28/19 рр	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Vanadium	24.7	6.0	mg/kg	1	01/25/19	01/28/19 рр	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA46051

(2) Prep QC Batch: MP12281



4.5 **4** 



Client Sample ID:	108_M0	16_1								
Lab Sample ID:	JC81864	-5A				Date Sampled	: 01	/25/19		
Matrix:	SO - Soi	O - Soil <b>Date Received:</b> 01/25/19								
						Percent Solids	: 83	.9		
Project:	PPG Site	107, 18 Chap	el Avenue	, Jersey Cit	y, NJ					
General Chemistry	7									
Analyte		Result	RL	Units	DF	Analyzed	By	Method		
Chromium, Trivaler	nt <sup>a</sup>	<del>-35.0</del> 36.1	1.7	mg/kg	1	01/28/19 15:02	DC	SW846 6010/7196A M		

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

Page 1 of 1





#### SGS LabLink@1041356 11:42 03-Jun-2019

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		

## **Report of Analysis**

**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 рр	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	18.8	1.1	mg/kg	1	01/25/19	01/28/19 PP	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	16.6	4.4	mg/kg	1	01/25/19	01/28/19 PP	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Thallium	< 1.1	1.1	mg/kg	1	01/25/19	01/28/19 PP	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Vanadium	25.7	5.5	mg/kg	1	01/25/19	01/28/19 PP	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA46051

(2) Prep QC Batch: MP12281



4.6 **4** 



Client Sample ID:	107_M0	34N						
Lab Sample ID:	JC81864	-6A				Date Sampled	: 01	/25/19
Matrix:	SO - Soi	l				Date Received	: 01	/25/19
						Percent Solids	: 87	.3
Project:	PPG Site	e 107, 18 Chap	el Avenue	e, Jersey Cit	y, NJ			
General Chemistry	,							
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivaler	nt <sup>a</sup>	<del>-18.1</del> 18.8	1.6	mg/kg	1	01/28/19 15:02	DC	SW846 6010/7196A M

Page 1 of 1

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



Client Sample ID:	108_M018N_1		
Lab Sample ID:	JC81864-7A	Date Sampled:	01/25/19
Matrix:	SO - Soil	Date Received:	01/25/19
		<b>Percent Solids:</b>	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	< 2.3 UJ-	2.3	mg/kg	1	01/25/19	01/28/19 pp	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	64.2	1.2	mg/kg	1	01/25/19	01/28/19 pp	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	26.0	4.7	mg/kg	1	01/25/19	01/28/19 pp	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Thallium	< 1.2	1.2	mg/kg	1	01/25/19	01/28/19 pp	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Vanadium	29.1	5.8	mg/kg	1	01/25/19	01/28/19 pp	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA46051

(2) Prep QC Batch: MP12281



4.7 4



Client Sample ID: Lab Sample ID: Matrix: Project:	108_M01 JC81864- SO - Soil PPG Site	8N_1 7A 107, 18	Chapel	Avenue,	Jersey City	y, NJ	Date Sampled Date Received Percent Solids	: 01 : 01 : 90	/25/19 /25/19 .3
General Chemistry	,								
Analyte		Result		RL	Units	DF	Analyzed	By	Method
Chromium, Trivaler	nt <sup>a</sup>	61.1	61.9	1.6	mg/kg	1	01/28/19 15:02	DC	SW846 6010/7196A M

Page 1 of 1

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





Client Sample ID:	108_M018N		
Lab Sample ID:	JC81864-8A	Date Sampled:	01/25/19
Matrix:	SO - Soil	Date Received:	01/25/19
		<b>Percent Solids:</b>	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 <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	30.6	1.2	mg/kg	1	01/25/19	01/28/19 рр	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	14.8	4.6	mg/kg	1	01/25/19	01/28/19 рр	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Thallium	< 1.2	1.2	mg/kg	1	01/25/19	01/28/19 рр	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Vanadium	25.5	5.8	mg/kg	1	01/25/19	01/28/19 рр	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA46051

(2) Prep QC Batch: MP12281



4.8 **4** 



JC81864A

Client Sample ID:	108_M01	8N						
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 Chape	el Avenue	e, Jersey Cit	y, NJ			
General Chemistry								
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivaler	nt <sup>a</sup>	<del>-24.6</del> 24.5	1.7	mg/kg	1	01/28/19 15:02	DC	SW846 6010/7196A M

Page 1 of 1

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







**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:

				Sample			Analysis	;
SDG	Sample ID		Matrix	Date	Parent Sample	Cr VI	MET	MISC
1004040	FB(20190128)	JC81918-1	Water	1/28/2019		х	Х	х
SDG JC81918	BS-A4	JC81918-2	Soil	1/28/2019		x	х	х
	FB(20190129)	JC81985-1	Water	1/29/2019		х	Х	х
	SW-A12(0.0-0.5)	JC81985-2	Soil	1/29/2019		X	Х	х
	SW-A12(1.0-1.5)	JC81985-3	Soil	1/29/2019		X	Х	х
	SW-A13(0.0-0.5)	JC81985-4	Soil	1/29/2019		X	Х	х
	SW-A13(2.0-2.5)	JC81985-5	Soil	1/29/2019		x	Х	х
JC81985	SW-A14(0.0-0.5)	JC81985-6	Soil	1/29/2019		x	Х	х
	SW-A14(2.0-2.5)	JC81985-7	Soil	1/29/2019		x	Х	х
	SW-A15(0.0-0.5)	JC81985-8	Soil	1/29/2019		x	х	х
	SW-A15(2.0-2.5)	JC81985-9	Soil	1/29/2019		x	Х	х
	SW-A16(0.0-0.5)	JC81985-10	Soil	1/29/2019		x	х	x
	SW-A16(2.0-2.5)	JC81985-11	Soil	1/29/2019		x	Х	х
	SW-A17(0.0-0.5)	JC81985-12	Soil	1/29/2019		x	х	х
	SW-A17(2.0-2.5)	JC81985-13	Soil	1/29/2019		x	х	х
	BS-A20	JC81985-14	Soil	1/29/2019		x	Х	х
	FB(20190129)-108	JC82063-1	Water	1/29/2019		х	Х	х
	BS-A3	JC82063-2	Soil	1/29/2019		x	х	х
	BS-A3TT	JC82063-3	Soil	1/29/2019		x	х	x
JC82063	108_M018N	JC82063-4	Soil	1/29/2019		x	Х	х
	108_M018N_1	JC82063-5	Soil	1/29/2019		х	Х	х
	BS-A4	JC82063-6	Soil	1/29/2019		Х	Х	х

Notes:

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

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#### DATA REVIEW REPORT

- 2. Cr VI is hexavalent chromium.
- 3. Miscellaneous parameters include pH and redox potential.
- 4. <u>SDG #JC81985</u>: 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.

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

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.

#### DATA REVIEW REPORT

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	
	Water	180 days from collection to analysis	Preserved to a pH of less than 2; Cool to <6°C	
SW-846 6010C	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  $\pm$  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		orted	Performance Acceptable		Not
		Yes	No	Yes	Required
Inductively Coupled Plasma-Atomic Emission Spectrometer	ry (ICP-AE	ES)			
Tier II Validation			-		
Holding Times		x		Х	
Reporting limits (units)		x		Х	
Blanks			-		
A. Instrument Blanks		x		Х	
B. Method Blanks		x		Х	
C. Equipment/Field Blanks		x		Х	
Laboratory Control Sample (LCS)		x		Х	
Laboratory Control Sample Duplicate (LCSD)	Х				Х
LCS/LCSD Precision (RPD)	Х				Х
Matrix Spike (MS) %R	Х				Х
Matrix Spike Duplicate (MSD) %R	Х				Х
MS/MSD Precision (RPD)	Х				Х
Field/Lab Duplicate (RPD)	Х				Х
ICP Serial Dilution %D	Х				Х
Total vs. Dissolved	Х				Х
Reporting Limit Verification		x		Х	
Tier III Validation					
Initial Calibration Verification		x		Х	
Continuing Calibration Verification		x		Х	
CRDL Standard Recovery		x		Х	
ICP Interference Check		x		Х	
ICP-MS Internal Standards	Х				Х
Transcription/calculations acceptable		Х		Х	
Raw Data	Х				Х
Reporting limits adjusted to reflect sample dilutions		Х		Х	
Notes:					

%R Percent recovery

RPD Relative percent difference

%D Percent difference

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#### 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.

	Qualification			
Criteria	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 spike analyses. The control limits do not apply when the parent sample concentration exceeds the spike amount by a factor of four or greater.

<u>SDG #JC81918</u>: 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.

<u>SDGs #JC81985</u>: 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.

<u>SDGs #JC82063</u>: The MS analysis performed on sample locations BS-A3 in association with the soluble hexavalent chromium analysis exhibited recoveries within the control limits.

<u>SDGs #JC81985 and JC82063</u>: 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 <sup>1</sup>
	Non-detect	UJ-
Spike recovery ≥ 50% but < 75%	Detect J-	
	Non-detect	R
Spike recovery < 50%	Detect	R
Spike recovery > 125%	Non-detect	No Action
Spike recovery > 125% but ≤ 150%	Detect	J+
Spike recovery > 150%	Detect	R

Notes:

<sup>1</sup> 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.

<u>SDG #JC82063</u>: The reanalysis of the field sample is usable. No qualification of the sample results was required.

<u>SDG #JC81985</u>: 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  $\pm$  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.

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

# DATA VALIDATION CHECKLIST FOR HEXAVALENT CHROMIUM

%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	SW846 9045D	Analysis: 2 days	< 24 hours of receipt by laboratory
108_M018N_1			
BS-A4			
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.

	Qualification			
Criteria	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.

<u>SDGs #JC81918 and JC82063</u>: The laboratory duplicate analysis was not performed using a sample from these SDGs.

<u>SDG #JC81985</u>: 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	Reported		Performance Acceptable		Not Required
9045D, ASTM D1498-76	No	Yes	No	Yes	Required
Miscellaneous Instrumentation					
Tier II Validation					
Holding times		x	х		
Reporting limits (units)		x		X	
Blanks					
A. Instrument Blanks		х		Х	
B. Method blanks		х		Х	
C. Equipment blanks		Х		X	
Laboratory Control Sample (LCS) %R		Х		Х	
Laboratory Control Sample Duplicate (LCSD) %R	Х				Х
LCS/LCSD Precision (RPD)	Х				Х
Matrix Spike (MS) %R	Х				Х
Matrix Spike Duplicate (MSD) %R	Х				Х
MS/MSD Precision (RPD)	Х				Х
Field/Lab Duplicate (RPD)		Х		X	
Dilution Factor		Х		X	
Tier III Validation			·		<u> </u>
Initial calibration %RSD or correlation coefficient	Х				Х
Continuing calibration %R	Х				Х
Raw Data		Х		Х	
Transcription/calculation errors present		x		Х	
Reporting limits adjusted to reflect sample dilutions		x		Х	
Notes:					

%R Percent recovery

RPD Relative percent difference

VALIDATION PERFORMED BY: Jennifer Singer

SIGNATURE:

Annifer Alinger

DATE: June 5, 2019

PEER REVIEW: Dennis Capria

DATE: June 27, 2019

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# CHAIN OF CUSTODY CORRECTED SAMPLE ANALYSIS DATA SHEETS



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JC81918: Chain of Custody Page 1 of 2

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< 0.010

345

5.70

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

Chromium, Hexavalent

Redox Potential Vs H2

pH <sup>a</sup>

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# **Report of Analysis**

Page 1 of 1

SW846 7196A

ASTM D1498-76

SM4500H+ B-11

4.1



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		

# **Report of Analysis**

### **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

# Page 1 of 1

4.2



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		

# **Report of Analysis**

### **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 <sup>1</sup>	SW846 3010A <sup>2</sup>
Chromium	< 10	10	ug/l	1	01/29/19	01/29/19 GT	SW846 6010D 1	SW846 3010A <sup>2</sup>
Nickel	< 10	10	ug/l	1	01/29/19	01/29/19 GT	SW846 6010D 1	SW846 3010A <sup>2</sup>
Thallium	< 10	10	ug/l	1	01/29/19	01/29/19 GT	SW846 6010D 1	SW846 3010A <sup>2</sup>
Vanadium	< 50	50	ug/l	1	01/29/19	01/29/19 GT	SW846 6010D 1	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA46055

(2) Prep QC Batch: MP12303



4



			_		-			
Client Sample ID:	FB(20190	)128)						
Lab Sample ID:	JC81918-	1A				Date Sampled	: 01	/28/19
Matrix:	AQ - Fiel	d Blank Soil				Date Received	: 01	/28/19
	-					Percent Solids	: n/a	a
Project:	PPG Site	107, 18 Chap	bel Avenue,	Jersey Cit	y, NJ			
General Chemistry								
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivaler	nt <sup>a</sup>	< 0.020	0.020	mg/l	1	01/29/19 18:18	GT	SW846 6010/7196A M

# **Report of Analysis**

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

Page 1 of 1

4.1



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		

# **Report of Analysis**

**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 <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	21.7	1.1	mg/kg	1	01/28/19	01/29/19 GT	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	14.3	4.5	mg/kg	1	01/28/19	01/29/19 GT	SW846 6010D 1	SW846 3050B <sup>2</sup>
Thallium	< 1.1	1.1	mg/kg	1	01/28/19	01/29/19 GT	SW846 6010D 1	SW846 3050B <sup>2</sup>
Vanadium	20.8	5.6	mg/kg	1	01/28/19	01/29/19 GT	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA46055

(2) Prep QC Batch: MP12302



4.2 **4** 



Client Sample ID: Lab Sample ID: Matrix: Project:	BS-A4 JC81918- SO - Soil PPG Site	2A 107, 18 Cha	apel Avenue	, Jersey Cit	y, NJ	Date Sampled: Date Received Percent Solids	01 01 86	/28/19 /28/19 5.3
General Chemistry								
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivaler	nt <sup>a</sup>	18.8	1.6	mg/kg	1	01/29/19 17:26	NV	SW846 6010/7196A M

# **Report of Analysis**

Page 1 of 1

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





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<u> 3</u> G <u>3</u>	6B		SG5	North Ame Route 130	erica Inc. Davton	- Daytor	n 10				FED	EX Trackin	9#				Bottle Or	der Cont	trol #			
			TEL. 732	-329-0200	FAX	732-329-	3499				SGS	Quote #					SGS Job	#	-	500	10	er
Client / Reporting Information		C. P. St. S. S. Martin	Project	www.sgs.	com/ehs	Usa	ante a	19. C		10015016	100	Pas		t Anal	veie /	ene Tf	STC		(heat)	<u>'CB</u>	CONT.	Matrix Codes
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Lab		Conec					ΗT.		#	·····································	$\Box$	4 Y	Ī,	Ś	10	Z	৾					
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1 FB(20190129)		1/29/19	1200	<b>c</b> C	Fß	2		1	1		>	$\langle \times$	$\times$	$\times$	X	Х	X					Azy
2 SW-A12 (0.0-0.5)		1/29/19	6900	CC	50	1			1			< x	X	X	X	х	х					43
3 SW -A12(10-1,5)		1/29/19	0910	CC	SO	1			1		X	X	X	X	X	X	X					MZG
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)		1/25/15	0940	CC	Sõ				1		X	X	X	X	X	х	X					
6 SW - A14 (0.0-0.5)		1/24/19	0950	CC	SO				ł			X	X	X	Х	X	X					
7 SW - A14(2.0 - 2.5)		1/21/19	1000	cc	50	1			1		X	x	X	X	X	X	X					
8 SW - A15 (0.0 - 0.5)		1/29/19	1010	CC	SO	1			l		X	X	X	X	X	X	X					
9 SW-A15 (2.0-2.5)		1/29/19	1020	cc	02	i			1		X	X	X	×	X	Х	X		INIT	A		
10 SW -A14(0.0 -0.5)		1/29/19	1030	CC	50	1			1			X	X	X	Χ	Х	X			r A	ESS	110
11 SW-A14(2.0-2.5)		1/29/11	1040	CC	SO	1			1		X	X	X	X	X	X	X	- 4	4BEL	VFD	~	ENTSA
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5 Day RUSH					JLLT1 (L	evel 3+4 )				State For	ms											1.
3 Day RUSH					Reduce	1			X	EDD For	mat <u>E</u>	9-15	<u> </u>									
2 Day RUSH					ommercia N/ Doto	1 "C"				Other												
other				Commercial	"A" = Ree	ults Only	Com	mercial	"B" = R	esuits + O	C Summar	v										
Emergency & Rush T/A data available via LabLink				NJ Reduced	i = Result	a + QC Sur	mmarv	+ Partia	Raw da	ata		,	Sam	ple inv	ventor	y is ve	rified	upon	receip	t in the	e Lat	oratory
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Form:SM088-03C (revised 2/12/18)

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JC81985: Chain of Custody Page 1 of 5





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			TEL. 734	www.sgs.	com/ehs	usa	-3499					SGS Quo	te #					SGS Jo	b#	J	8198	5
Client / Reporting Information	Deviced Name	1	Project	Informatio	m								Requ	lested	Analy	sis (	see Ti	EST C	ODE sheet)	T T	Mat	ix Codes
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Project Contact E-mail	NPOOLS	20 00	NI MARA	Street Addre	:55							5	٦	Ч			.				LIQ-	Jther Liquid JR - Air
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Sampler(s) Name(s) Phone #	Project Manager			Attention:								~	7	4	र्दे	11	4	3			RB- F	≀inse Blank Trip Blank
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Lab					1		T		5 w	t ate	ORE	12	Ŧ	4	Ą	ŕ	>	2				
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13  SW - A17(2.0 - 2.5)		1/29/19	1100	cc	So	1		П	1			X	X	X	X	Х	X	$ \times $				
$14$ $Bi - A2\Omega$		129/19	1400	CR	SO	i		П	1			X	X	x	X	χ	X	$\left  \times \right $				
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Std. 10 Business Days	Approved by (St	55 Project Manage	erpoate:		ommercia	n A (Lev al "B" (Lev	vel 1) vel 2)		H	NYASP	Catego	ay A ary B										
5 Day RUSH			-		ULLT1 (I	.evel 3+4 )				State F	orms											
3 Day RUSH			-		J Reduce	d J. TCT			X	EDD F	ormat	Equi	ı ب									
Day RUSH			-		NJ Data	of Known	Qualit	y Prote	لــــا 000/Re	porting												
other			_	Commercial	"A" = Res	ults Only;	Comr	nercial	"B" = R	esults +	QC Sur	nmary										
Emergency & Rush T/A data available via LabLink		and Costs		NJ Reduced	d = Result	s + QC Su	mmary +	Partia	I Raw d	ata	inel		rior	Samp	le inv	entor	y is v	erified	upon recei	pt in the	Laborator	у
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Form:SM088-03C (revised 2/12/18)

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JC81985: Chain of Custody Page 2 of 5



5.2

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< 0.010

324

5.63

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

Chromium, Hexavalent

Redox Potential Vs H2

pH <sup>a</sup>

Client Sample ID: Lab Sample ID:	FB(20190129) JC81985-1				Date Sampl	<b>ed:</b> 01	/29/19	
Matrix: Project:	AQ - Field Blank Soil PPG Site 107, 18 Cha	apel Avenue	e, Jersey Ci	Date Received:01/29/19Percent Solids:n/a				
General Chemistry	7	1	- , <b>,</b> -					
Analyte	Result	RL	Units	DF	Analyzed	By	Method	

mg/l

mv

su

1

1

1

01/29/19 19:57 LS

01/30/19 12:15 RI

 $01/29/19 \ 16{:}26 \ \text{HM} \qquad \text{SM4500H+ B-11}$ 

0.010

# **Report of Analysis**

Page 1 of 1

SW846 7196A

ASTM D1498-76

4.1

RL = Reporting Limit



Conoral Chamistry			
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		
		Percent Solids:	81.6
Matrix:	SO - Soil	Date Received:	01/29/19
Lab Sample ID:	JC81985-2	Date Sampled:	01/29/19
Client Sample ID:	SW-A12(0.0-0.5)		

# **Report of Analysis**

#### 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

4.2





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		
			,

# **Report of Analysis**

#### **General Chemistry**

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	1.6 <b>J</b> -	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

# Page 1 of 1

4.3

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		

# **Report of Analysis**

### **General Chemistry**

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	1.1 <b>J-</b>	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

# Page 1 of 1

4.4



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		

# **Report of Analysis**

#### **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

# Page 1 of 1

4.5



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		

# **Report of Analysis**

#### **General Chemistry**

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	0.94 <b>J</b> -	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

# Page 1 of 1

4.6



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		

# **Report of Analysis**

### **General Chemistry**

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	< 0.44 <b>UJ</b> -	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

# Page 1 of 1

4.7



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		

# **Report of Analysis**

#### 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

# Page 1 of 1

4.8



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		

# **Report of Analysis**

#### **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

# Page 1 of 1

4.9



				J
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ			
		Percent Solids:	80.7	4
Matrix:	SO - Soil	Date Received:	01/29/19	
Lab Sample ID:	JC81985-10	Date Sampled:	01/29/19	10
Client Sample ID:	SW-A16(0.0-0.5)			4

# **Report of Analysis**

#### **General Chemistry**

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	0.90 <b>J</b> -	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

# Page 1 of 1



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		

# **Report of Analysis**

#### General Chemistry

RL = Reporting Limit

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		IIIV 0/	1	01/30/19 15:48	RI	ASIM D1498-76M
Solids, Percent	/4.1		%	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

# Page 1 of 1

4.11 **4** 

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		

# **Report of Analysis**

# **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

# Page 1 of 1

4.12 4
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		
Comonal Chamister			

# **Report of Analysis**

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

Page 1 of 1

4.13



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

### Page 1 of 1





			Repo	rt of An	alysis	Page 1 of 1
Client Sample ID:	SW-A12(	0.0-0.5)				
Lab Sample ID:	JC81985-	2R				<b>Date Sampled:</b> 01/29/19
Matrix:	SO - Soil					<b>Date Received:</b> 01/29/19
						Percent Solids: 81.6
Project:	PPG Site	107, 18 Cha	pel Aven <del>ue</del>	Jersey Cit	y, NJ	
General Chemistr	y					
Analyte		Result	RL	Units	DF	Analyzed By Method
Chromium, Hexava	alent	< 0.49	0.49	mg/kg	1	02/05/19 12:24 RI SW846 3060A/7196A



4.1 **4** 

		Repo	rt of An	alysis	Page 1 of 1	
Client Sample ID: Lab Sample ID: Matrix:	SW-A12(1.0-1.5) JC81985-3R SO - Soil				Date Sampled: 01/29/19 Date Received: 01/29/19 Percent Solids: 64 7	4.2
Project:	PPG Site 107, 18 C	hapel Avenue	, Jersey Cit	y, NJ	recent sonds. 04.7	+>
General Chemistry	7					
Analyte	Result	RL	Units	DF	Analyzed By Method	
Chromium, Hexava	lent < 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				<b>Date Sampled:</b> 01/29/19				
Matrix:	SO - Soil				<b>Date Received:</b> 01/29/19				
					Percent Solids: 80.4				
Project:	PPG Site 107, 18 Chap	pel Avenue	Jersey Cit	y, NJ					
General Chemistry									
Analyte	Result	RL	Units	DF	Analyzed By Method				
Chromium, Hexaval	ent < 0.50	0.50	mg/kg	1	02/05/19 12:24 RI SW846 3060A/7196A				

RL = Reporting Limit

4.3

	Report of Analysis									
Client Sample ID:	SW-A13(2.0-2.5)									
Lab Sample ID:	JC81985-5R				<b>Date Sampled:</b> 01/29/19					
Matrix:	SO - Soil				<b>Date Received:</b> 01/29/19					
					Percent Solids: 85.7					
Project:	PPG Site 107, 18 Ch	apel Avenue	, Jersey Cit	y, NJ						
General Chemistry	7									
Analyte	Result	RL	Units	DF	Analyzed By Met	hod				
Chromium, Hexava	lent 0.55	0.47	mg/kg	1	02/05/19 12:24 RI SW84	6 3060A/7196A				

### RL = Reporting Limit



4.4

_		Repo	rt of An	alysis	Page 1 of 1
Client Sample ID: SW-A Lab Sample ID: JC819 Matrix: SO -	14(0.0-0.5) 985-6R Soil				Date Sampled: 01/29/19 Date Received: 01/29/19 Demont Solida: 70 0
Project: PPG S General Chemistry	Site 107, 18 Cha	pel Avenue	e, Jersey Cit	y, NJ	Percent Sonds: 79.9
Analyte	Result	RL	Units	DF	Analyzed By Method
Chromium, Hexavalent	1.8	0.50	mg/kg	1	02/05/19 12:24 RI SW846 3069A/7196A

### RL = Reporting Limit



			Repo	rt of An	alysis		Page 1 of 1
Client Sample ID:	SW-A14(2.0-	-2.5)					120 140
Lab Sample ID:	JC81985-7R					Date Sampled: 01	/29/19
Matrix:	SO - Soil					<b>Date Received:</b> 01/	/29/19
						Percent Solids: 89	.9
Project:	PPG Site 107	, 18 Chap	el Avenue,	Jersey City	y, NJ		
General Chemistry	y						
Analyte	Re	sult	RL	Units	DF	Analyzed By	Method
Chromium, Hexava	alent <	0.44	0.44	mg/kg	1	02/05/19 12:24 RI	SW846 3069A/7196A

	4.6
	4



		Repo	rt of An	alysis	Page 1 of 1
Client Sample ID:	SW-A15(0.0-0.5)				
Lab Sample ID:	<del>JC8</del> 1985-8R				<b>Date Sampled:</b> 01/29/19
Matrix:	SO - Soil				<b>Date Received:</b> 01/29/19
		_			Percent Solids: 81.7
Project:	PPG Site 107, 18 Chap	el Avenue	, Jersey Cit	y, NJ	
General Chemistry					
Analyte	Result	RL	Units	DF	Analyzed By Method
Chromium, Hexavale	ent 6.1	0.49	mg/kg	1	02/05/19 12:24 ri sw846 3060A/7196A



	<b>Report of Analysis</b>									
Client Sample ID:	SW-A15(2.0-2.5)				Data Samulada 01/20/10		4			
Matrix:	SO - Soil				<b>Date Sampled:</b> 01/29/19 <b>Date Received:</b> 01/29/19	, ,	8			
<b>D</b> • 4			I C'	NT	Percent Solids: 78.2		4			
General Chemistr	v	per Avents	, Jersey Cit	y, NJ		•				
Analyte	Result	RL	Units	DF	Analyzed By Met	hod				
Chromium, Hexava	alent 0.59	0.51	mg/kg	1	02/05/19 12:24 RI SW84	46 3069A/7196A				



	Repo	rt of An	alysis	Page 1 of 1
W-A16(0.0-0.5)				
81985-10R				<b>Date Sampled:</b> 01/29/19
) - Soil				<b>Date Received:</b> 01/29/19
				Percent Solids: 80.7
PG Site 107, 18 Cha	pel Avenue	, Jersey Cit	y, NJ	
Result	RL	Units	DF	Analyzed By Method
< 0.50	0.50	mg/kg	1	02/05/19 12:17 ri S\\$46 3060A/7196A
	W-A16(0.0-0.5) 81985-10R D - Soil PG Site 107, 18 Cha Result < 0.50	Report       W-A16(0.0-0.5)       \$81985-10R       O - Soil       PG Site 107, 18 Chapel Avenue       Result     RL       < 0.50	Report of An       W-A16(0.0-0.5)       \$81985-10R       D - Soil       PG Site 107, 18 Chapel Avenue, Jersey Cit       Result     RL       Units       < 0.50	Report of Analysis     W-A16(0.0-0.5)     \$81985-10R     D - Soil     PG Site 107, 18 Chapel Avenue, Jersey City, NJ     Result   RL   Units   DF      < 0.50



4.9

0.78 J

52400

NEGATIVE UJ

Iron, Ferrous <sup>a</sup>

Sulfide Screen b

Total Organic Carbon

Client Sample ID: Lab Sample ID: Matrix: Project:	SW-A16(0.0-0.5) JC81985-10RT SO - Soil PPG Site 107, 18 Cha	pel Avenue	e, Jersey Cit	y, NJ	Date Sampled:     01/29/19       Date Received:     01/29/19       Percent Solids:     80.7			
General Chemistry	,							
Analyte	Result	RL	Units	DF	Analyzed	By	Method	

1

1

1

02/07/19 11:15 ST

02/07/19 11:15 ST

02/07/19 17:46 јо

### **Report of Analysis**

Page 1 of 1

ASTM D3872-86

SM4500S2- A-11

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.

%

mg/kg

0.20

120

(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.



	Report of Analysis								
Client Sample ID:	SW-A16(2.0-2.5)					4.1			
Lab Sample ID: Matrix:	SO - Soil				<b>Date Sampled:</b> 01/29/19 <b>Date Received:</b> 01/29/19				
Project.	PDC Site 107 18 Ch	anal Avanna	Jarsay Cit	v NI	Percent Solids: 74.1	4			
General Chemistry		iper Avenue	, jersey en	y, 113					
Analyte	Result	RL	Units	DF	Analyzed By Method				
Chromium, Hexaval	ent 12.4	0.54	mg/kg	1	02/05/19 12:24 RI SW846 3060A/7196A				



	Report of Analysis									
Client Sample ID:	SW-A17(0.0-0.5)					ł				
Lab Sample ID:	JC81985-12R				<b>Date Sampled:</b> 01/29/19	•				
Matrix:	SO - Soil				<b>Date Received:</b> 01/29/19					
					Percent Solids: 82.3	4				
Project:	PPG Site 107, 18 Cha	pel Avenue	Jersey Cit	y, NJ						
General Chemistry										
Analyte	Result	RL	Units	DF	Analyzed By Method					
Chromium, Hexava	lent 8.8	0.49	mg/kg	1	02/05/19 12:24 RI SW846 3060A/7196A					



-

	Report of Analysis								
Client Sample ID: Lab Sample ID: Matrix:	SW-A17(2.0-2.5) JC <del>81</del> 985-13R SO - Soil				Date Sampled:     01/29/19       Date Received:     01/29/19       Percent Solids:     80.8				
Project:	PPG Site 107, 18 Cha	pel Avenue	, Jersey Cit	y, NJ					
General Chemistr	y								
Analyte	Result	RL	Units	DF	Analyzed By Method				
Chromium, Hexava	alent 5.0	0.50	mg/kg	1	02/05/19 12:26 RI SW846 3060A/7196A				



-

	Report of Analysis										
Client Sample ID:	BS-A20										
Lab Sample ID:	JC81985-14R				<b>Date Sampled:</b> 01/29/19						
Matrix:	SO - Soil				<b>Date Received:</b> 01/29/19						
					Percent Solids: 87.2						
Project:	PPG Site 107, 18 Chap	bel Avenue	, Jersey City	y, NJ							
General Chemistry											
Analyte	Result	RL	Units	DF	Analyzed By Method						
Chromium, Hexava	lent 0.48	0.46	mg/kg	1	02/05/19 12:26 RI SW846 306	0A/7196A					



4.14 4

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		

# **Report of Analysis**

### **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 <sup>1</sup>	SW846 3010A <sup>2</sup>
Chromium	< 10	10	ug/l	1	01/30/19	01/30/19 pp	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>
Nickel	< 10	10	ug/l	1	01/30/19	01/30/19 pp	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>
Thallium	< 10	10	ug/l	1	01/30/19	01/30/19 pp	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>
Vanadium	< 50	50	ug/l	1	01/30/19	01/30/19 pp	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA46062

(2) Prep QC Batch: MP12316







Client Sample ID: Lab Sample ID:	FB(20190 JC81985-	129) 1A	•			Date Sampled	: 01	/29/19		
Matrix:	AQ - Fiel	d Blank Soil				Date Received: 01/29/19 Percent Solids: n/a				
Project:	PPG Site	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ								
General Chemistry										
Analyte		Result	RL	Units	DF	Analyzed	By	Method		
Chromium, Trivaler	nt <sup>a</sup>	< 0.020	0.020	mg/l	1	01/30/19 17:46	PP	SW846 6010/7196A M		

### **Report of Analysis**

Page 1 of 1

4.1

4

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





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 <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	364	1.3	mg/kg	1	01/30/19	01/30/19 pp	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	58.8	5.1	mg/kg	1	01/30/19	01/30/19 pp	SW846 6010D 1	SW846 3050B <sup>2</sup>
Thallium <sup>a</sup>	< 2.6	2.6	mg/kg	2	01/30/19	01/30/19 pp	SW846 6010D 1	SW846 3050B <sup>2</sup>
Vanadium	65.2	6.4	mg/kg	1	01/30/19	01/30/19 pp	SW846 6010D 1	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA46062

(2) Prep QC Batch: MP12317

(a) Elevated detection limit due to dilution required for high interfering element.

Page 1 of 1





Client Sample ID: Lab Sample ID: Matrix: Project:	SW-A12(0.0-0.5)   JC81985-2A   Date Sampled: 01/29/19     SO - Soil   Date Received: 01/29/19     PPG Site 107, 18 Chapel Avenue, Jersey City, NJ   Precent Solids: 81.6								
General Chemistry	,								
Analyte		Result	RL	Units	DF	Analyzed	By	Method	
Chromium, Trivaler	nt <sup>a</sup>	363	1.8	mg/kg	1	01/31/19 14:57	DC	SW846 6010/7196A M	

Page 1 of 1

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





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
		<b>Percent Solids:</b>	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 <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	35.7	1.6	mg/kg	1	01/30/19	01/30/19 pp	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	22.0	6.2	mg/kg	1	01/30/19	01/30/19 pp	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Thallium	< 1.6	1.6	mg/kg	1	01/30/19	01/30/19 pp	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Vanadium	43.9	7.8	mg/kg	1	01/30/19	01/30/19 pp	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA46062

(2) Prep QC Batch: MP12317



4.3 **4** 



Client Sample ID: Lab Sample ID: Matrix: Project:	SW-A12(1.0-1.5)   JC81985-3A   Date Sampled: 01/29/19     SO - Soil   Date Received: 01/29/19     PPG Site 107, 18 Chapel Avenue, Jersey City, NJ   64.7								
General Chemistry									
Analyte		Result	RL	Units	DF	Analyzed	By	Method	
Chromium, Trivaler	nt <sup>a</sup>	34.1	2.2	mg/kg	1	01/31/19 14:57	DC	SW846 6010/7196A M	

Page 1 of 1

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



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
		<b>Percent Solids:</b>	80.4
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

# **Report of Analysis**

#### **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 <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	24.0	1.3	mg/kg	1	01/30/19	01/30/19 pp	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	16.5	5.1	mg/kg	1	01/30/19	01/30/19 pp	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Thallium	< 1.3	1.3	mg/kg	1	01/30/19	01/30/19 pp	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Vanadium	42.0	6.4	mg/kg	1	01/30/19	01/30/19 PP	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA46062

(2) Prep QC Batch: MP12317







Client Sample ID: Lab Sample ID: Matrix: Project:	SW-A13(0.0-0.5)     JC81985-4A     SO - Soil     PPG Site 107, 18 Chapel Avenue, Jersey City, NJ         Date Sampled:   01/29/19     Percent Solids:   80.4								
General Chemistry									
Analyte		Result	RL	Units	DF	Analyzed	By	Method	
Chromium, Trivaler	nt <sup>a</sup>	22.9	1.8	mg/kg	1	01/31/19 14:57	DC	SW846 6010/7196A M	

Page 1 of 1

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



Matrix:	SO - Soil	Date Received: Percent Solids:	01/29/19 85.7	
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ			

### **Report of Analysis**

**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 <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	27.1	1.2	mg/kg	1	01/30/19	01/30/19 pp	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	18.8	4.7	mg/kg	1	01/30/19	01/30/19 pp	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Thallium	< 1.2	1.2	mg/kg	1	01/30/19	01/30/19 pp	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Vanadium	30.9	5.8	mg/kg	1	01/30/19	01/30/19 pp	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA46062

(2) Prep QC Batch: MP12317



4.5 **4** 



Client Sample ID: Lab Sample ID: Matrix: Project:	SW-A13(2.0-2.5)   JC81985-5A   Date Sampled: 01/29/19     SO - Soil   Date Received: 01/29/19     PPG Site 107, 18 Chapel Avenue, Jersey City, NJ   Percent Solids: 85.7							
General Chemistry								
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivaler	nt <sup>a</sup>	26.6	1.7	mg/kg	1	01/31/19 14:57	DC	SW846 6010/7196A M

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

4.5



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
		<b>Percent Solids:</b>	79.9
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

# **Report of Analysis**

#### **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 <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	60.3	1.3	mg/kg	1	01/30/19	01/30/19 pp	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	25.4	5.2	mg/kg	1	01/30/19	01/30/19 pp	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Thallium	< 1.3	1.3	mg/kg	1	01/30/19	01/30/19 pp	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Vanadium	42.0	6.5	mg/kg	1	01/30/19	01/30/19 pp	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA46062

(2) Prep QC Batch: MP12317







Client Sample ID: Lab Sample ID: Matrix: Project:	SW-A14(0.0-0.5)   JC81985-6A   Date Sampled: 01/29/19     SO - Soil   Date Received: 01/29/19     PPG Site 107, 18 Chapel Avenue, Jersey City, NJ   Percent Solids: 79.9								
Analyte		Result	RL	Units	DF	Analyzed	By	Method	
Chromium, Trivaler	nt <sup>a</sup>	59.4	1.8	mg/kg	1	01/31/19 14:57	DC	SW846 6010/7196A M	

Page 1 of 1

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



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		

# **Report of Analysis**

#### **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 <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	17.3	1.1	mg/kg	1	01/30/19	01/30/19 pp	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	14.9	4.4	mg/kg	1	01/30/19	01/30/19 pp	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Thallium	< 1.1	1.1	mg/kg	1	01/30/19	01/30/19 pp	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Vanadium	23.2	5.5	mg/kg	1	01/30/19	01/30/19 pp	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA46062

(2) Prep QC Batch: MP12317



4.7 4



Client Sample ID: Lab Sample ID: Matrix: Project:	SW-A14(2.0-2.5)   JC81985-7A   Date Sampled: 01/29/19     SO - Soil   Date Received: 01/29/19     PPG Site 107, 18 Chapel Avenue, Jersey City, NJ   Percent Solids: 89.9								
General Chemistry									
Analyte		Result	RL	Units	DF	Analyzed	By	Method	
Chromium, Trivaler	nt <sup>a</sup>	17.3	1.5	mg/kg	1	01/31/19 14:57	DC	SW846 6010/7196A M	

Page 1 of 1

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





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
		<b>Percent Solids:</b>	81.7
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

# **Report of Analysis**

#### **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 <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	58.5	1.2	mg/kg	1	01/30/19	01/30/19 pp	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	29.7	4.8	mg/kg	1	01/30/19	01/30/19 pp	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Thallium	< 1.2	1.2	mg/kg	1	01/30/19	01/30/19 pp	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Vanadium	35.2	5.9	mg/kg	1	01/30/19	01/30/19 pp	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA46062

(2) Prep QC Batch: MP12317







Client Sample ID: Lab Sample ID: Matrix: Project:	SW-A15(0.0-0.5)   JC81985-8A   Date Sampled: 01/29/19     SO - Soil   Date Received: 01/29/19     PPG Site 107, 18 Chapel Avenue, Jersey City, NJ   Percent Solids: 81.7								
General Chemistry									
Analyte		Result	RL	Units	DF	Analyzed	By	Method	
Chromium, Trivaler	nt <sup>a</sup>	57.5	1.7	mg/kg	1	01/31/19 14:57	DC	SW846 6010/7196A M	

Page 1 of 1

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



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
		<b>Percent Solids:</b>	78.2
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

# **Report of Analysis**

#### **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 <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	36.1	1.3	mg/kg	1	01/30/19	01/30/19 pp	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	15.6	5.2	mg/kg	1	01/30/19	01/30/19 pp	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Thallium	< 1.3	1.3	mg/kg	1	01/30/19	01/30/19 pp	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Vanadium	41.0	6.5	mg/kg	1	01/30/19	01/30/19 pp	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA46062

(2) Prep QC Batch: MP12317







	Report of Analysis Page 1 of 1										
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	PG Site 107, 18 Chapel Avenue, Jersey City, NJ									
General Chemistry	,										
Analyte		Result	R	L	Units	DF	Analyzed	By	Method		
Chromium, Trivaler	nt <sup>a</sup>	34.8	1.	8	mg/kg	1	01/31/19 14:57	DC	SW846 6010/7196A M		

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







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
		<b>Percent Solids:</b>	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 <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	43.3	1.3	mg/kg	1	01/30/19	01/30/19 pp	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	37.7	5.1	mg/kg	1	01/30/19	01/30/19 pp	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Thallium	< 1.3	1.3	mg/kg	1	01/30/19	01/30/19 pp	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Vanadium	38.2	6.4	mg/kg	1	01/30/19	01/30/19 pp	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA46062

(2) Prep QC Batch: MP12317





Client Sample ID: Lab Sample ID: Matrix: Project:	SW-A16(0.0-0.5) JC81985-10A SO - Soil PPG Site 107, 18 Chapel Avenue, Jersey City, NJ					Date Sampled:01/29/19Date Received:01/29/19Percent Solids:80.7		
General Chemistry								
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivaler	nt <sup>a</sup>	42.4	1.8	mg/kg	1	01/31/19 14:49	DC	SW846 6010/7196A M

Page 1 of 1

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




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
		<b>Percent Solids:</b>	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 <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	125	1.3	mg/kg	1	01/30/19	01/30/19 pp	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	21.2	5.3	mg/kg	1	01/30/19	01/30/19 pp	SW846 6010D 1	SW846 3050B <sup>2</sup>
Thallium	< 1.3	1.3	mg/kg	1	01/30/19	01/30/19 pp	SW846 6010D 1	SW846 3050B <sup>2</sup>
Vanadium	46.7	6.6	mg/kg	1	01/30/19	01/30/19 pp	SW846 6010D 1	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA46062

(2) Prep QC Batch: MP12317







Report of Analysis Page 1 of 1												
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	PG Site 107, 18 Chapel Avenue, Jersey City, NJ										
General Chemistry	7											
Analyte		Result	RL	Units	DF	Analyzed	By	Method				
Chromium, Trivaler	nt <sup>a</sup>	123	1.8	mg/kg	1	01/31/19 14:57	DC	SW846 6010/7196A M				

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

#### Page 1 of 1

4.11 4



#### SGS LabLink@1041356 11:45 03-Jun-2019

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
		<b>Percent Solids:</b>	82.3
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

# **Report of Analysis**

#### **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 <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	180	1.2	mg/kg	1	01/30/19	01/30/19 pp	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	15.7	4.9	mg/kg	1	01/30/19	01/30/19 pp	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Thallium	< 1.2	1.2	mg/kg	1	01/30/19	01/30/19 pp	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Vanadium	36.6	6.1	mg/kg	1	01/30/19	01/30/19 pp	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA46062

(2) Prep QC Batch: MP12317









	Report of Analysis Page 1 of 1												
Client Sample ID:	SW-A17(	0.0-0.5)											
Lab Sample ID:	JC81985-	-12A				Date Sampled	: 01	/29/19					
Matrix:	SO - Soil					Date Received	l: 01	/29/19					
						Percent Solids	<b>s:</b> 82	.3					
Project:	PPG Site	PG Site 107, 18 Chapel Avenue, Jersey City, NJ											
General Chemistry	7												
Analyte		Result	RL	Units	DF	Analyzed	By	Method					
Chromium, Trivaler	nt <sup>a</sup>	175	1.7	mg/kg	1	01/31/19 14:57	DC	SW846 6010/7196A M					

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







#### SGS LabLink@1041356 11:45 03-Jun-2019

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		

# **Report of Analysis**

**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 <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	143	1.2	mg/kg	1	01/30/19	01/30/19 pp	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	17.4	4.9	mg/kg	1	01/30/19	01/30/19 pp	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Thallium	< 1.2	1.2	mg/kg	1	01/30/19	01/30/19 pp	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Vanadium	29.9	6.1	mg/kg	1	01/30/19	01/30/19 pp	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA46062

(2) Prep QC Batch: MP12317





Client Sample ID: Lab Sample ID: Matrix: Project:	e ID:   SW-A17(2.0-2.5)     ID:   JC81985-13A     SO - Soil   Date Sampled:   01/29/19     Percent Solids:   80.8							
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivaler	nt <sup>a</sup>	136	1.7	mg/kg	1	01/31/19 14:59	DC	SW846 6010/7196A M

Page 1 of 1

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





Client Sample ID:	BS-A20		
Lab Sample ID:	JC81985-14A	Date Sampled:	01/29/19
Matrix:	SO - Soil	Date Received:	01/29/19
		<b>Percent Solids:</b>	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 <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	29.2	1.1	mg/kg	1	01/30/19	01/30/19 pp	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	15.6	4.4	mg/kg	1	01/30/19	01/30/19 pp	SW846 6010D 1	SW846 3050B <sup>2</sup>
Thallium	< 1.1	1.1	mg/kg	1	01/30/19	01/30/19 pp	SW846 6010D 1	SW846 3050B <sup>2</sup>
Vanadium	24.1	5.5	mg/kg	1	01/30/19	01/30/19 pp	SW846 6010D 1	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA46062

(2) Prep QC Batch: MP12317



4.14 **4** 



			Rep	ort of A	nalysis			Page 1 of 1
Client Sample ID:	BS-A20	144					01	/20/10
Lab Sample ID:	JC81985-	-14A				Date Sampled	: 01	/29/19
Matrix:	SO - Soil					Date Received	: 01	/29/19
						Percent Solids	: 87	1.2
Project:	PPG Site	107, 18 Ch	apel Aven	ue, Jersey C	ity, NJ			
General Chemistry	7							
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivaler	nt <sup>a</sup>	26.9	1.6	mg/kg	1	01/31/19 14:59	DC	SW846 6010/7196A M

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

#### Page 1 of 1





Other Reporting Information     Proved Information     Proved Information     Restrict Adapting (rate 7527 CODE street)     Information            even time           Proved Information			çВ		2235 TEL. 73	Route 130 2-329-0200	Dayton FAX	, NJ 080 732-329	310 I-3499				FE	D-EX Trac S Quote #	king #				Bottle (	Order Co	ontrol #	508	206	31
Part Name     Project Name <th>Client / Reporting Information</th> <th>1</th> <th></th> <th></th> <th>Project</th> <th>Information</th> <th>on</th> <th>susa</th> <th></th> <th></th> <th></th> <th></th> <th></th> <th>R</th> <th>equest</th> <th>ed Ana</th> <th>lvsis (</th> <th>see T</th> <th>EST C</th> <th>ODE</th> <th>sheet)</th> <th></th> <th>Mat</th> <th>trix Code</th>	Client / Reporting Information	1			Project	Information	on	susa						R	equest	ed Ana	lvsis (	see T	EST C	ODE	sheet)		Mat	trix Code
Trademine   The Secsure   City St. H. 107     0. Freeding   Construction   Base   Construction (if affective free frequencies)   If affective free frequencies   If affective frequenci   If affective frequencies <td>npany Name</td> <td>Proj</td> <td>ject Name:</td> <td>-</td> <td></td> <td>N - 1 - 1</td> <td></td> <td>T</td> <td>1</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>	npany Name	Proj	ject Name:	-		N - 1 - 1											T	1						
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Field D/ Point of Collection   MECHOI Vall#   Date   Time   sampled by   Metric   Losins   9   9   8   9   9   8   9   9   8   9   9   8   9   9   8   9   9   8   9   9   8   9   <	le						1	#of	T	8	S III I	0H ORE		10/	Î L		N	F		1				
CB (2019 012A) = 108   1/26/19   1/430   CB   FB   2   1   1   X	Field ID / Point of Collection	MEC	OH/DI Vial #	Date	Time	Sampled by	Matrix	bottles	HCI NaO	HNC	NON	MEC											LAB	USE ON
35   A35   B5-A3   1/25 / 19   1410   C6   50   1   11   X <td>B-B(20190129)-</td> <td>108</td> <td></td> <td>1/29/19</td> <td>1630</td> <td>CB</td> <td>FB</td> <td>2</td> <td></td> <td>1</td> <td>1</td> <td></td> <td>7</td> <td><math>\langle X \rangle</math></td> <td>X</td> <td>X</td> <td>X</td> <td>X</td> <td>X</td> <td></td> <td></td> <td></td> <td>A</td> <td>24</td>	B-B(20190129)-	108		1/29/19	1630	CB	FB	2		1	1		7	$\langle X \rangle$	X	X	X	X	X				A	24
BS - A3 TT   II 21/1   III 25/11   IIII 25/11   IIII 25/11   IIII 25/11   IIII 25/11   IIII 25/11   IIII 25/11   IIIII 25/11   IIIII 25/11   IIIII 25/11   IIIII 25/11   IIIIII 25/11   IIIIIIII 25/11   IIIIII 25/11   IIIII 25/11   IIIII 25/11   IIIIII 25/11   IIIIIIII 25/11   IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII	485-A35 BS-	A3		1/29/19	1410	CB	50	1			11			$\langle X \rangle$	X	X	X	X	X				C	126
108M018N_1   1125   1420   CR_S0   1   1   X <td>BS - ASTT</td> <td></td> <td></td> <td>1/29/19</td> <td>1415</td> <td>CB</td> <td>SO</td> <td>1</td> <td></td> <td></td> <td>11</td> <td></td> <td></td> <td><math>\langle   \times \rangle</math></td> <td>X</td> <td>X</td> <td>X</td> <td>X</td> <td>X</td> <td></td> <td></td> <td></td> <td>M</td> <td>126</td>	BS - ASTT			1/29/19	1415	CB	SO	1			11			$\langle   \times \rangle$	X	X	X	X	X				M	126
188 - MG18N-1   112919   1430   CB S0   1   1   X X X X X X X X X X X X X X X X X X X	108_M018N			1/29/19	1420	CB	So	1		$\square$	1		>	$\langle   \times \rangle$	X	X	X	X	x		·			
BS - AQ   1/24/19   14/35   CB   S0   1   1   X	108_ M018N_1			1/29/19	1430	CB	SO	1			1		)	$\langle   x \rangle$	X	X	X	X	X					
Turnaround Time (Business days)   Data Deliverable Information   Comments / Special Instructions     Turnaround Time (Business days)   Data Deliverable Information   Comments / Special Instructions     Std. 10 Business Days   So Day RUSH   Commercial "A" (Level 1)   NVASP Category A     Std. 10 Business Days   Commercial "A" (Level 2)   NVASP Category B     Std. 10 Business Days   Commercial "A" (Level 3)   NVASP Category B     Std. 10 Business Days   Commercial "A" (Level 3)   NVASP Category B     Std. 10 Business Days   Commercial "A" (Level 3)   NVASP Category B     Std. 10 Business Days   Commercial "A" (Level 3)   NVASP Category B     Std. 10 Business Days   Commercial "A" (Level 3)   NVASP Category B     Std. 10 Business Days   Commercial "A" (Level 3)   NVASP Category B     Std. 10 Business Days   Commercial "A" (Level 3)   NVASP Category B     Std. 10 Business   Commercial "A" (Level 3)   NVASP Category B     Std. 10 Business   Commercial "A" "Results Only:   Commercial "A" "Results Only:   Commercial "A" "Results Only:     2 Day RUSH   Only Commercial "A" "Results Only:   Commercial "A" "Results Only:   Commercial "A" "Results Only:   Commercial "A" "Results Only:   Sa	KS-A4			1/29/19	1435	CB	so	- i		-	1			X	X	X	X	X	X					
Turnaround Time (Business days)   Data Deliverable Information   Comments / Special Instructions     Turnaround Time (Business days)   Approved by (SGS Project Manager)/Date:   Commercial "A" (Level 1)   NVASP Category A     Std. 10 Business Days   Commercial "A" (Level 2)   NVASP Category A     S Day RUSH   Commercial "A" (Level 3)   INTIAL ASESSMENT     Data Deliverable Information   Commercial "A" (Level 3)   INTIAL ASESSMENT     Z Day RUSH   Onmercial "A" = Results (New 2)   INTIAL ASESSMENT     Z Day RUSH   IN Reduced   EDD Format   EVELTI (Level 34)     G ther   IN Beduced   EDD Format   EVELTI (Level 34)     I Day RUSH   IN Reduced   EDD Format   EVELTI (Level 34)     G ther   IN Beduced   EDD Format   EVELTI (Level 34)     I Day RUSH   IN Reduced Results + OC Summary   Sample Inventory is verified upon receipt in the Laboratory     ND Reduced   Reserved avel a Results + OC Summary   Proteined Inventory is verified upon receipt in the Laboratory     Under Str America   The Castory By:   A   Proteined By:   Proteined By:     Under Str America   Reserved By:   A   Proteined By:   Proteined By:										$\vdash$														
Turnaround Time (Business days)   Data Deliverable Information   Comments / Special Instructions     Std. 10 Business Days   Approved by (SGS Project Manager)/Date:   Commercial "A" (Level 1)   NYASP Category A     Std. 10 Business Days   Commercial "A" (Level 2)   NYASP Category A     Std. 10 Business Days   Commercial "A" (Level 2)   NYASP Category B     Std. 10 Business Days   Commercial "A" (Level 2)   NYASP Category B     Data Pully   Commercial "B" (Level 2)   NYASP Category B     Std. 10 Business Days   Commercial "B" (Level 2)   NYASP Category B     Data Pully   Commercial "B" (Level 3)   NITIAL ASESSMENT     Data Pully   Commercial "C"   Other     Data Pully   Commercial "C"   Other     Data Pully   Commercial "C"   Other     Data Time   NJ Reduced   Escurits + QC Summary     Sample Inventory is verified upon receipt in the Laboratory   Sample Inventory is verified upon receipt in the Laboratory     United by Sampler:   Data Time:   Reserved By:   Alexance     Ultimet by:   Data Time:   Reserved By:   Alexance     Ultimet by:   Data Time:   Reserved By:   Alexance  <											++-	$\left  - \right  $			-	+								
Turnaround Time (Business days)   Data Deliverable Information   Comments / Special Instructions     Std. 10 Business Days   Approved by (SGS Project Manager)/Date:   Commercial "A" (Level 1)   NYASP Category A     S Day RUSH   Commercial "B" (Level 2)   NYASP Category B   INITIAL ASESSMENT   Approved by (SGS Project Manager)/Date:   Commercial "B" (Level 3)   NYASP Category B     3 Day RUSH   Commercial "B" (Level 3)   NVASP Category B   INITIAL ASESSMENT   Approved by (SGS Project Manager)/Date:   Commercial "B" (Level 3)   NVASP Category B     3 Day RUSH   Dist of Known Caalify Protect Responsion   Other   INITIAL ASESSMENT   Approved by (SGS Project Manager)/Date:   INITIAL ASESSMENT   Approved by (SGS			1. 1. 1. 1.				<u> </u>					$\left  \cdot \right $										<u>, 18, 1</u> 9 11		
Turnaround Time (Business days)   Data Deliverable Information   Comments / Special Instructions     Std. 10 Business Days   Approved by (SGS Project Manager)/Date:   Commercial "A" (Level 1)   NYASP Category A     S Day RUSH   Commercial "A" (Level 2)   NYASP Category B   INITIAL ASESSMENT   Approved by (SGS Project Manager)/Date:   Commercial "A" (Level 3)   NYASP Category B     3 Day RUSH   Commercial "A" (Level 3)   NVASP Category B   INITIAL ASESSMENT   Approved by (SGS Project Manager)/Date:   INITIAL ASESSMENT   Approved by (SGS Project Manager)/P							1.12															i.		
Approved by (SGS Project Manager)/Date:   Commercial "A" (Level 1)   NYASP Category A     Std. 10 Business Days   Commercial "A" (Level 1)   NYASP Category A     S Day RUSH   Commercial "A" (Level 2)   NYASP Category B     J Day RUSH   Std. 10 Business Days   NJ Reduced   NJ Reduced     D Day RUSH   Commercial "C"   Other   LABEL VERIFICATION     D other   NJ Reduced   Commercial "S" Results Only:   Commercial "S" Results + QC Summary     Sample Inventory is verified upon receipt in the Laboratory   NJ Reduced Results + QC Summary + Braila Raw data   Sample Inventory is verified upon receipt in the Laboratory     University Strengther   Data Time:   Resolved Dy:   Anacute Data   Preserved informer applicable     Ultered by:   Data Time:   Resolved Dy:   Custody Basi # 3 CML   Preserved informer applicable   Oute Time; 12 CML     Bast Time:   Resolved By:   Custody Basi # 3 CML   Preserved informer applicable   Oute Time; 12 CML     Bast Time:   Resolved By:   Custody Basi # 3 CML   Preserved informer applicable   Oute Group Cogler Temp; 1 C	Turnaround Time ( Business days)						L	Data	Deliver	able Ir	formatic		-			1		Com	ments /	Speci	al Instru	ctions		
Outry Business Days   Commercial "B" (Lavel 2)   NYASP Category B     S Day RUSH   FULLTI (Lavel 2)   NYASP Category B     Data Time:   Commercial "B" (Lavel 2)   NYASP Category B     Data Time:   Reserved by:   Custody Bail (Javel 2)   NYASP Category B     Image: Data Time:   Reserved by:   Custody Bail (Javel 2)   NYASP Category B     Image: Data Time:   Reserved By:   Custody Bail (Javel 2)   NYASP Category B     Image: Data Time:   Reserved By:   Custody Bail (JAPC)   Preserved infrare applicable     Out for the data Time:   Reserved By:   Custody Bail (JAPC)   Preserved infrare applicable     Out for the data Time:   Reserved By:   Custody Bail (JAPC)   Preserved infrare applicable	C Std 40 Business Barry	Appro	oved by (SG	S Project Manage	er)/Date:	C	ommercial	"A" (Lev	el 1)		<b>N</b>	YASP Ca	tegory A	•								cuorio pa		
□ 3 Day RUSH   □ NJ Reduced   □ Sup RUSH   □ NJ Reduced   □ Sup RUSH   □ NJ Reduced   □	5 Day RUSH				•		ommercial ILLT1 ( L	"B" ( Lev evel 3+4 )	el 2)			YASP Cat ate Form	tegory E Is	3	-		1913				<u></u>	0	110	5
Lage Solution Lage So	3 Day RUSH					N.	Reduced					DD Form	at <u>F</u>	100			11	NITIA	LAS	ESS	MENT	24	IA	
□ other Commercial 'A" = Results Only: Commercial 'B" = Results + QC Summary   Tigmtry & Rush T/A data available vis LabLink NJ Reduced = Results + QC Summary + Partial Rew data   Sample Inventory is verified upon receipt in the Laboratory   University Sample   Data Time:   Reserved By:   Utilitied by:   Data Time:   Reserved By:   Sample Inventory By:   Utilitied by:   Data Time:   Reserved By:   Sample Inventory By:   Utilitied by:	1 Day RUSH						mmercial NJ Data	"C" of Known	Quality	Proto	O Repo	ther					L	ABEL	VER	RIFIC	ATION	, 18		
Sample Custody must be documented below each time samples consummary + Partial Raw data     Sample Inventory is verified upon receipt in the Laboratory       University formula     Daty Time;     Sample Custody must be documented below each time samples change possession, including courier deliver, with the courter deliver, with the d	other	1				Commercial	'A" = Resu	Its Only;	Comm	ercial "	B" = Rest	ilts + QC	Summar	y										
Date Time:     Received By:     Date Time:     Received By:     Date Time:     Date Time:     Received By:     Time:     Date Time:     Received By:     Time:     Date Time:     Concert and time:     Received By:     Time:     Date Time:     Received By:     Time:     Received By:     Time:     Received By:     Custody Basis     J 3/0 (1)     Time:     Received By:	rigency & Rosh T/A data available via LabLin	אר	Sa	mple Custody n	nust be docu	NJ Reduced mented belo	= Results	+ QC Sun time sam	imary +	Partial	Raw data posses:	sion, inc	luding	courier	Sam	ple inv	entor	y is ve	erified	upon	receip	ot in the	Laboratory	<u>y</u>
Stampler: Offset Time: Received By: Data Time: Received By:   1 1 1 1 1   1 1 1 1 1   1 1 1 1 1   1 1 1 1 1   1 1 1 1 1   1 1 1 1 1   1 1 1 1 1   1 1 1 1 1   1 1 1 1 1	Auister by Chaples	Date Timey 1/30/19 12	2:10	Received By:	1040	. I.			Relinguin	shed By	aite	Que .	ila	115		Date Th	ne:	190	Receive 2	d By:	~	1		r
ulahed by: Data Time: Received By: Custody Seal # / 3 // Cl/ Intact Preserved where applicable On Ice & Cogler Tempor 1 °C	quished by Sampler:	Date Time:	F	Received By:	4 CAR	ه پند معانی	0.5		Relinguis	ihed By	<u>елу ніс.</u> Г	eace a	Na	2/10		Date Ti	ne:	111	Receive	d By:	~			
	guished by:	Date Time:	F	Received By: 5	an a				Custody	Seal #	1300	in E		xt Intent	Preser	ved when	e applica	ble			On Ice	ar c	ogler Temp	100

JC82063: Chain of Custody Page 1 of 4



SGS

5.2

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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
		<b>Percent Solids:</b>	n/a
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

**General Chemistry** 

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent <sup>a</sup>	< 0.010 <b>UJ</b>	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 <sup>b</sup>	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.

Page 1 of 1





Client Sample ID:	BS-A3		
Lab Sample ID:	JC82063-2	Date Sampled:	01/29/19
Matrix:	SO - Soil	Date Received:	01/30/19
		<b>Percent Solids:</b>	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

#### Page 1 of 1

4.2



Client Sample ID:	BS-A3TT		
Lab Sample ID:	JC82063-3	Date Sampled:	01/29/19
Matrix:	SO - Soil	Date Received:	01/30/19
		<b>Percent Solids:</b>	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
рН	8.82 J		su	1	01/31/19 15:04	RI	SW846 9045D

Page 1 of 1



Client Sample ID:	108_M018N		
Lab Sample ID:	JC82063-4	Date Sampled:	01/29/19
Matrix:	SO - Soil	Date Received:	01/30/19
		<b>Percent Solids:</b>	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	mø/kø	1	02/01/19 10.18	RI	SW846 3060A/7196A
Redox Potential Vs H2	272	0.15	my	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

#### Page 1 of 1

4.4



Client Sample ID:	108_M018N_1		
Lab Sample ID:	JC82063-5	Date Sampled:	01/29/19
Matrix:	SO - Soil	Date Received:	01/30/19
		<b>Percent Solids:</b>	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

#### Page 1 of 1

4.5



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

#### Page 1 of 1

4.6



Client Sample ID: Lab Sample ID: Matrix: Project:	BS-A3 JC82063- SO - Soil PPG Site	2R 107, 18 Ch	apel Avenue,	Jersey Cit	y, NJ	Date Sampled Date Received Percent Solids	: 01 : 01 : 90	/29/19 /30/19 0.1
General Chemistry	7							
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexava	lent	1.8	0.44	mg/kg	1	02/04/19 15:24	RI	SW846 3060A/7196A

Page 1 of 1

4.1



Client Sample ID: Lab Sample ID: Matrix: Project:	BS-A3TT JC82063- SO - Soil PPG Site	3R 107, 18 Cha	apel Avenue,	Date Sampled Date Received Percent Solids	: 01 : 01 : 89	/29/19 /30/19 .8		
General Chemistry	7							
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexava	lent	9.9	0.45	mg/kg	1	02/04/19 15:27	RI	SW846 3060A/7196A

Page 1 of 1

Client Sample ID: Lab Sample ID: Matrix: Project:	108_M01 JC82063- SO - Soil PPG Site	8N 4R 107, 18 Cha	npel Avenue,	Jersey Cit	y, NJ	Date Sampled Date Received Percent Solids	: 01 : 01 : 88	/29/19 /30/19 .8
General Chemistry								
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexava	lent	3.2	0.45	mg/kg	1	02/04/19 15:27	RI	SW846 3060A/7196A

Page 1 of 1



Client Sample ID: Lab Sample ID: Matrix: Project:	108_M01 JC82063- SO - Soil PPG Site	8N_1 -5R 107, 18 Cha	apel Avenue,	Jersey Cit	Date Sampled Date Received Percent Solids	: 01 : 01 : 88	/29/19 /30/19 .5	
General Chemistry	7							
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexava	lent	2.2	0.45	mg/kg	1	02/04/19 15:27	RI	SW846 3060A/7196A

Page 1 of 1



Client Sample ID: Lab Sample ID: Matrix: Project:	BS-A4Date Sampled:01/29/19JC82063-6RDate Sampled:01/29/19SO - SoilDate Received:01/30/19PPG Site 107, 18 Chapel Avenue, Jersey City, NJ90.4								
General Chemistry									
Analyte		Result	RL	Units	DF	Analyzed	By	Method	
Chromium, Hexava	lent	< 0.44	0.44	mg/kg	1	02/04/19 15:27	RI	SW846 3060A/7196A	

Page 1 of 1



#### SGS LabLink@1041356 11:46 03-Jun-2019

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		

# **Report of Analysis**

#### **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 <sup>1</sup>	SW846 3010A <sup>2</sup>
Chromium	< 10	10	ug/l	1	01/31/19	01/31/19 GT	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>
Nickel	< 10	10	ug/l	1	01/31/19	01/31/19 GT	SW846 6010D 1	SW846 3010A <sup>2</sup>
Thallium	< 10	10	ug/l	1	01/31/19	01/31/19 GT	SW846 6010D 1	SW846 3010A <sup>2</sup>
Vanadium	< 50	50	ug/l	1	01/31/19	01/31/19 GT	SW846 6010D 1	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA46067

(2) Prep QC Batch: MP12330



4



Client Sample ID: Lab Sample ID: Matrix: Project:	FB (2019 JC82063- AQ - Fiel PPG Site	0129)-108 1A ld Blank Soil 107, 18 Chaj	pel Avenue,	Jersey Cit	y, NJ	Date Sampled Date Received Percent Solids	: 01 : 01 : n/a	/29/19 /30/19 a
General Chemistry	7							
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivaler	nt <sup>a</sup>	< 0.020	0.020	mg/l	1	01/31/19 19:10	GT	SW846 6010/7196A M

Page 1 of 1

44

4

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





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 <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	28.3	1.1	mg/kg	1	01/31/19	01/31/19 GT	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	14.7	4.4	mg/kg	1	01/31/19	01/31/19 GT	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Thallium	< 1.1	1.1	mg/kg	1	01/31/19	01/31/19 GT	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Vanadium	24.2	5.5	mg/kg	1	01/31/19	01/31/19 gt	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA46067

(2) Prep QC Batch: MP12331



4.2 **4** 



Client Sample ID: Lab Sample ID: Matrix: Project:	BS-A3 JC82063 SO - Soit	-2A 1 107, 18 Chap	el Avenue,	Jersey City	y, NJ	Date Sampled Date Received Percent Solids	: 01 : 01 : 90	/29/19 /30/19 .1
General Chemistry								
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivaler	nt <sup>a</sup>	<del>- 26.7 -</del> 26.5	1.5	mg/kg	1	02/01/19 10:15	RI	SW846 6010/7196A M

Page 1 of 1

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





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 <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	75.8	1.1	mg/kg	1	01/31/19	01/31/19 GT	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	15.0	4.6	mg/kg	1	01/31/19	01/31/19 GT	SW846 6010D 1	SW846 3050B <sup>2</sup>
Thallium	< 1.1	1.1	mg/kg	1	01/31/19	01/31/19 GT	SW846 6010D 1	SW846 3050B <sup>2</sup>
Vanadium	23.1	5.7	mg/kg	1	01/31/19	01/31/19 GT	SW846 6010D 1	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA46067

(2) Prep QC Batch: MP12331



4.3 **4** 



Client Sample ID: Lab Sample ID: Matrix: Project:	BS-A3TTJC82063-3ADate Sampled:01/29/19SO - SoilDate Received:01/30/19PPG Site 107, 18 Chapel Avenue, Jersey City, NJPercent Solids:89.8								
General Chemistry									
Analyte		Result	RL	Units	DF	Analyzed	By	Method	
Chromium, Trivaler	nt <sup>a</sup>	<del>-69.8</del> - 65.9	1.6	mg/kg	1	02/01/19 10:18	RI	SW846 6010/7196A M	

Page 1 of 1

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





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		

**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 <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	49.0	1.1	mg/kg	1	01/31/19	01/31/19 GT	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	13.5	4.5	mg/kg	1	01/31/19	01/31/19 GT	SW846 6010D 1	SW846 3050B <sup>2</sup>
Thallium	< 1.1	1.1	mg/kg	1	01/31/19	01/31/19 GT	SW846 6010D 1	SW846 3050B <sup>2</sup>
Vanadium	23.3	5.6	mg/kg	1	01/31/19	01/31/19 GT	SW846 6010D 1	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA46067

(2) Prep QC Batch: MP12331





Client Sample ID: Lab Sample ID: Matrix: Project:	108_M018N   JC82063-4A   Date Sampled: 01/29/19     SO - Soil   Date Received: 01/30/19     PPG Site 107, 18 Chapel Avenue, Jersey City, NJ   Percent Solids: 88.8									
General Chemistry										
Analyte		Result	RL	Units	DF	Analyzed	By	Method		
Chromium, Trivaler	nt <sup>a</sup>	<del>44.8</del> 45.8	1.6	mg/kg	1	02/01/19 10:18	RI	SW846 6010/7196A M		

Page 1 of 1

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





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 <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	60.7	1.1	mg/kg	1	01/31/19	01/31/19 gt	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	15.1	4.5	mg/kg	1	01/31/19	01/31/19 gt	SW846 6010D 1	SW846 3050B <sup>2</sup>
Thallium	< 1.1	1.1	mg/kg	1	01/31/19	01/31/19 gt	SW846 6010D 1	SW846 3050B <sup>2</sup>
Vanadium	23.2	5.6	mg/kg	1	01/31/19	01/31/19 GT	SW846 6010D 1	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA46067

(2) Prep QC Batch: MP12331



4.5 **4** 



Client Sample ID: Lab Sample ID: Matrix: Project:	: 108_M018N_1 JC82063-5A SO - Soil PPG Site 107, 18 Chapel Avenue, Jersey City, NJ Date Sampled: 01/29/19 Date Received: 01/30/19 Percent Solids: 88.5									
General Chemistry										
Analyte		Result	RL	Units	DF	Analyzed	By	Method		
Chromium, Trivaler	nt <sup>a</sup>	57.2 58.5	1.6	mg/kg	1	02/01/19 10:18	RI	SW846 6010/7196A M		

Page 1 of 1

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





Client Sample ID:	BS-A4		
Lab Sample ID:	JC82063-6A	Date Sampled:	01/29/19
Matrix:	SO - Soil	Date Received:	01/30/19
		<b>Percent Solids:</b>	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 <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	16.6	1.1	mg/kg	1	01/31/19	01/31/19 GT	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	13.9	4.5	mg/kg	1	01/31/19	01/31/19 GT	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Thallium	< 1.1	1.1	mg/kg	1	01/31/19	01/31/19 GT	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Vanadium	19.2	5.6	mg/kg	1	01/31/19	01/31/19 GT	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA46067

(2) Prep QC Batch: MP12331



4.6 **4** 



Client Sample ID:	BS-A4										
Lab Sample ID:	JC82063-	-6A				Date Sampled:	: 01	/29/19			
Matrix:	SO - Soil	SO - Soil <b>Date Received:</b> 01/30/19									
						Percent Solids	: 90	.4			
Project:	PPG Site	107, 18 Chap	el Avenue	, Jersey Cit	y, NJ						
General Chemistry											
Analyte		Result	RL	Units	DF	Analyzed	By	Method			
Chromium, Trivaler	nt <sup>a</sup>	<del>- 16.0</del> 16.6	1.5	mg/kg	1	02/01/19 10:18	RI	SW846 6010/7196A M			

Page 1 of 1

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

4.6





**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		Analysis		
					Parent Sample	Cr VI	MET	MISC
JC83225	FB(20190220)	JC83225-1	Water	2/20/2019		х	Х	х
	BS-A17I	JC83225-2	Soil	2/20/2019		х	Х	х
JC83295	FB(20190222)	JC83295-1	Water	2/22/2019		х	Х	х
	CS-G18	JC83295-2	Soil	2/22/2019		х	Х	х
	BS-B17	JC83295-3	Soil	2/22/2019		x	Х	х
	BS-C18	JC83295-4	Soil	2/22/2019		x	х	х
JC83296	FB(20190222)-A	JC83296-1	Water	2/22/2019		х	Х	х
	SW-A24(0.0-0.5)	JC83296-2	Soil	2/22/2019		x	Х	х
	SW-A24(2.0-2.5)	JC83296-3	Soil	2/22/2019		x	х	х
	SW-A25(0.0-0.5)	JC83296-4	Soil	2/22/2019		x	Х	х
	SW-A25(2.0-2.5)	JC83296-5	Soil	2/22/2019		х	Х	х
	SW-A26(0.0-0.5)	JC83296-6	Soil	2/22/2019		x	Х	х
	SW-A26(2.0-2.5)	JC83296-7	Soil	2/22/2019		х	Х	х
	DUP-03(20190222)RR	JC83296-8	Soil	2/22/2019	SW-A25(2.0-2.5)	х	Х	х
JC83377	FB(20190225)	JC83377-1	Water	2/25/2019		х	Х	х
	BS-B3	JC83377-2	Soil	2/25/2019		x	Х	х
JC83434	FB(20190226)-A	JC83434-1	Water	2/26/2019		х	Х	х
	SW-A27(0.0-0.5)	JC83434-2	Soil	2/26/2019		x	Х	х
	SW-A27(2.0-2.5)	JC83434-3	Soil	2/26/2019		x	Х	х
	SW-A28(0.0-0.5)	JC83434-4	Soil	2/26/2019		x	х	x
	SW-A28(2.0-2.5)	JC83434-5	Soil	2/26/2019		x	Х	х
	SW-A29(0.0-0.5)	JC83434-6	Soil	2/26/2019		Х	Х	х
	SW-A29(2.0-2.5)	JC83434-7	Soil	2/26/2019		X	Х	х
	DUP-04(20190226)RR	JC83434-8	Soil	2/26/2019	SW-A27(2.0-2.5)	Х	Х	Х

#### DATA REVIEW REPORT

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. <u>SDGs #JC83225 and JC83295</u>: 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.

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

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
	Water	180 days from collection to analysis	Preserved to a pH of less than 2; Cool to $<6^{\circ}$ C
SW-846 6010C	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.

<u>SDGs #JC83225, JC83295, and JC83377</u>: The MS/MSD analysis was not performed using a sample from these SDGs.

<u>SDGs #JC83296 and JC83434</u>: 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	nple Location Analyte		MSD Recovery
	Antimony	AC (78.6%)	71.4%
SW-A24(2.0-2.5)	nple LocationAnalyte2.0-2.5)Antimony2.0-2.5)Antimony	< 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
	Non-detect	UJ-
MS/MSD percent recovery 30% to 74%	Detect J- Non-detect R	J-
	Non-detect	R
MS/MSD percent recovery < 30%	Detect J- Non-detect R Detect J-	J-
	Non-detect	No Action
MS/MSD percent recovery > 125%	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.

<u>SDGs #JC83225, JC83295, and JC83377</u>: The laboratory duplicate analysis was not performed using a sample from these SDGs.

<u>SDG #JC83434</u>: 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.

<u>SDG #JC83296</u>: 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	Qualification	
	Non-detect	UJ
> 20% (water) or > 35% (soll)	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	
	Antimony	3.7	2.7 U	AC	
	Vanadium	38.5	33.0		
SW-A25(2.0-2.5) / DUP-03(20190222)RR	Chromium	181	177	2.2%	
	Trivalent Chromium	167	163	2.4%	
	Nickel	34.5	28.8	18.0%	

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Sample ID/Duplicate ID	Analyte	Sample Result	Duplicate Result	RPD
	Chromium	16.6	20.2	19.6%
	Trivalent Chromium	15.2	20.2	28.2%
SW-A27(2.0-2.5)/DUP-04(20190226)RR	Nickel	14.3	12.1	
	Vanadium	23.5	22.8	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 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.

<u>SDGs #JC83225, JC83295, and JC83377</u>: The serial dilution analysis was not performed using a sample from these SDGs.

<u>SDGs #JC83296 and JC83434</u>: 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		orted	Perfo Acce	rmance ptable	Not
	No	Yes	No	Yes	Required
Inductively Coupled Plasma-Atomic Emission Spectromet	ry (ICP-AE	ES)			
Tier II Validation					
Holding Times		x		x	
Reporting limits (units)		x		x	
Blanks					
A. Instrument Blanks		х		х	
B. Method Blanks		x		x	
C. Equipment/Field Blanks		x		x	
Laboratory Control Sample (LCS)		x		x	
Laboratory Control Sample Duplicate (LCSD)	Х				Х
LCS/LCSD Precision (RPD)	Х				Х
Matrix Spike (MS) %R		Х	х		
Matrix Spike Duplicate (MSD) %R		х	х		
MS/MSD Precision (RPD)		х	х		
Field/Lab Duplicate (RPD)		Х		x	
ICP Serial Dilution %D		х		x	
Total vs. Dissolved	х				Х
Reporting Limit Verification		Х		x	
Tier III Validation					
Initial Calibration Verification		x		x	
Continuing Calibration Verification		Х		x	
CRDL Standard Recovery		x		x	
ICP Interference Check		x		x	
ICP-MS Internal Standards	Х				Х
Transcription/calculations acceptable		Х		Х	
Raw Data	х				Х
Reporting limits adjusted to reflect sample dilutions		Х		Х	
Notes:					

%R Percent recovery

RPD Relative percent difference

%D Percent difference

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#### 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.

	Qualification		
Criteria	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	
	Hexavalent Chromium, Soluble	< 50%	< 50%	
BS-A171	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 <sup>1</sup>
	Non-detect	UJ-
Spike recovery ≥ 50% but < 75%	Detect	J-
	Non-detect	R
Spike recovery < 50%	Detect	R
Spike recovery > 125%	Non-detect	No Action
Spike recovery > 125% but ≤ 150%	Detect	J+
Spike recovery > 150%	Detect	R

Notes:

<sup>1</sup> 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.

<u>SDGs #JC83225, JC83295, JC83296, JC83377, and JC83434</u>: 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  $\pm$  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.

<u>SDG #JC83434</u>: 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
Parent sample and/or laboratory duplicate	Parent sample and/or laboratory duplicate		UJ
sample result < four times the RL	± RL	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.

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

#### DATA VALIDATION CHECKLIST FOR HEXAVALENT CHROMIUM

%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		Analysis: 2 days	
CS-G18	-		
BS-B17			
BS-C18			
SW-A24(0.0-0.5)			
SW-A24(2.0-2.5)	SW846 9045D	Analysis: 3 days	< 24 hours of receipt by laboratory
SW-A25(0.0-0.5)		Analysis: 3 days	
SW-A25(2.0-2.5)			
SW-A26(0.0-0.5)			
SW-A26(2.0-2.5)			
DUP-03(20190222)RR			
BS-A17I	ASTM D3872.86	Analysis: 12 days	< 24 hours from collection
CS-G18	ASTM D3072-00	Analysis: 24 days	
BS-A17I	SM450082 A	Analysis: 12 days	< 7 days from collection
CS-G18	- SIVI400052-A	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.

	Qualification							
Criteria	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.

<u>SDG #JC83225</u>: 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.

<u>SDG #JC83295</u>: 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.

<u>SDGs #JC83225, JC83295, and JC83377</u>: The laboratory duplicate analysis was not performed using a sample from these SDGs.

<u>SDGs #JC83296 and JC83434</u>: 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
	Redox	412	458	10.6%
SW-A25(2.0-2.5) / DUP-03(20190222)RR	рН	7.19	7.35	2.2%
	Redox	354	322	9.5%
SW-A27(2.0-2.5)7 DUP-04(20190226)RR	рН	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		orted	Perfor Acce	mance otable	Not Required	
9045D, ASTM D1498-76	No	Yes	No	Yes	Required	
Miscellaneous Instrumentation						
Tier II Validation						
Holding times		x	x			
Reporting limits (units)		x		X		
Blanks						
A. Instrument Blanks		х		x		
B. Method blanks		X		x		
C. Equipment blanks		Х		X		
Laboratory Control Sample (LCS) %R		Х		X		
Laboratory Control Sample Duplicate (LCSD) %R	Х				Х	
LCS/LCSD Precision (RPD)	Х				Х	
Matrix Spike (MS) %R	Х				Х	
Matrix Spike Duplicate (MSD) %R	Х				Х	
MS/MSD Precision (RPD)	Х				Х	
Field/Lab Duplicate (RPD)		Х		X		
Dilution Factor		Х		X		
Tier III Validation	<u>.</u>		·		·	
Initial calibration %RSD or correlation coefficient	Х				Х	
Continuing calibration %R	Х				Х	
Raw Data		Х		x		
Transcription/calculation errors present		X		Х		
Reporting limits adjusted to reflect sample dilutions		х		Х		
Notes:					1	

%R Percent recovery

RPD Relative percent difference

VALIDATION PERFORMED BY: Jennifer Singer

SIGNATURE:

Annifer Ainger

DATE: June 20, 2019

PEER REVIEW: Dennis Capria

DATE: July 12, 2019

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# CHAIN OF CUSTODY CORRECTED SAMPLE ANALYSIS DATA SHEETS



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

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

JC83225: Chain of Custody Page 1 of 5



12 of 47

5.2

G

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	7			

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent <sup>a</sup>	< 0.010 <b>UJ</b>	0.010	mg/l	1	02/21/19 23:52	МО	SW846 7196A
Redox Potential Vs H2	392		mv	1	02/22/19 15:42	RI	ASTM D1498-76
pH <sup>b</sup>	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.

Page 1 of 1

4.1 **4** 



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		
Conceal Chamister			

#### **General Chemistry**

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	0.91 <b>J</b> -	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

#### Page 1 of 1

4.2



ge 1 of 1	Page			alysis	rt of An	Repo			
							.7I	Sample ID: BS-A	Client Sam
	)2/20/19	: 02/	Date Sampled:				25-2R	ample ID: JC832	Lab Sample
	02/21/19	: 02/	Date Received:				loil	x: SO - S	Matrix:
	59.5	: 59.	Percent Solids:						
				y, NJ	Jersey Cit	pel Avenue	lite 107, 18 Cha	et: PPG S	Project:
								al Chemistry	General Ch
	Method	By	Analyzed	DF	Units	RL	Result	te	Analyte
A/7196A	SW846 3060A	NV	02/27/19 16:41	1	mg/kg	0.67	1.2	nium, Hexavalent	Chromium,
)	SW846 3060	NV	02/27/19 16:41	1	mg/kg	0.67	1.2	nium, Hexavalent	Chromium,



4.1 4

Total Organic Carbon

Client Sample ID: Lab Sample ID: Matrix: Project:	BS-A17I JC83225-2RT SO - Soil PPG Site 107, 18 Cha	pel Avenue	e, Jersey Cit	y, NJ	Date Sample Date Receiv Percent Soli	ed: 02 ed: 02 ds: 59	2/20/19 2/21/19 0.5	
General Chemistry								
Analyte	Result	RL	Units	DF	Analyzed	By	Method	

#### **Report of Analysis**

Iron, Ferrous <sup>a</sup> 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

mg/kg

1

03/04/19 16:59 јо

(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.

170

19200

(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.



LLOYD KAHN 1988 MOD



#### SGS LabLink@1042801 15:24 14-Jun-2019

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		

# **Report of Analysis**

#### **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 <sup>1</sup>	SW846 3010A <sup>2</sup>
Chromium	< 10	10	ug/l	1	02/22/19	02/22/19 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>
Nickel	< 10	10	ug/l	1	02/22/19	02/22/19 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>
Thallium	< 10	10	ug/l	1	02/22/19	02/22/19 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>
Vanadium	< 50	50	ug/l	1	02/22/19	02/22/19 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA46192

(2) Prep QC Batch: MP12696



4

4



7 of 119

JC83225A

Client Sample ID: Lab Sample ID: Matrix: Project:	FB(20190 JC83225- AQ - Fiel PPG Site	)220) 1A d Blank Soil 107, 18 Chape	el Avenue,	Jersey City	7, NJ	Date Sampled Date Received Percent Solids	: 02, : 02, : n/a	/20/19 /21/19 1
General Chemistry								
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivaler	nt <sup>a</sup>	< 0.020	0.020	mg/l	1	02/22/19 18:20	ND	SW846 6010/7196A M

Page 1 of 1

44

4

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



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 Chromium <sup>a</sup>	< 3.4 19.0	3.4 5.0	mg/kg mg/kg	1 3	02/21/19	02/22/19 ND 02/25/19 ND	SW846 6010D <sup>1</sup> SW846 6010D <sup>2</sup>	SW846 3050B <sup>3</sup> SW846 3050B <sup>3</sup>
Nickel	16.0	6.7 5.0	mg/kg	1	02/21/19	02/22/19 ND 02/25/10 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>3</sup>
Vanadium	< 5.0 31.0	5.0 8.4	mg/kg mg/kg	5 1	02/21/19	02/22/19 ND 02/22/19 ND	SW846 6010D <sup>2</sup> SW846 6010D <sup>1</sup>	SW846 3050B <sup>3</sup> SW846 3050B <sup>3</sup>

(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.







Client Sample ID: Lab Sample ID: Matrix: Project:	BS-A17I JC83225- SO - Soil PPG Site	2A 107, 18 Cha	pel Avenue,	Jersey City	y, NJ	Date Sampled Date Received Percent Solids	: 02 : 02 : 59	/20/19 /21/19 .5
General Chemistry								
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivaler	nt <sup>a</sup>	18.1	5.7	mg/kg	1	02/25/19 15:28	DC	SW846 6010/7196A M

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







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Arc	adis	PPG Site 1	07 (Jersey Cl	ty)																							DW - Drinking Water
Sireel A	ddress	Street	~~~~		L										=												GW - Ground Water WW - Water
10 F	riends Lane, Suite 200	18 Chapel	Avenue		Billing In	formatio	n (if differ	ent from F	Report	to)												1		ľ.			SW - Surface Welor SO - Soil
City Nev	rtown, PA 184	A0 Jersey City		NJ	Company	/ Name																					SL-Sludge SED-Sediment
Project	Contact E-mail	Project #			Street Ad	dress									-												OI - Oil LIQ - Other Liquid
Matt	new Bet	NP000770.0	003																								AIR - Air SOL - Other Solid
Phone / 610	755.7080	Clent Purchas	Clent Purchase Order # City							Suble			2	Ø			_										WP - Wipe FB - Field Blank
Sample	(s) Name(s) Pt	hone # Project Maneg	Project Manager Attention:							•					-		- mail	ş								1	E8-Equipment Blank R8 - Rinse Stank
	C Buchanan	Jim Mclaus	Jim Mclaughlin, Jr.												En u	5	how									TB - Trip Blank	
				Collection	, 	T				Num	ber of p		ad Boo			Cha	rvaken	lient C	hou	-	5	dium				ł	
SOS Nortpanie	Field ID / Point of Collection	MECHIDI VIA N	Date	Time	Sampled by	Grab (G) Comp (G)	Masrix	F of bottes	₽	NaOH	1 NO	NONE	DI Wa	ŝ		Total	Ě	Triva	Antin	ž	Trail	-Vana					LAB USE ONLY
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7	CS-018		2/22/19	1345	СВ	G	\$0	1	$\square$	-	-	1	+	$\mathbf{T}$	1;	x )		х	х	x	X	X	1				
3	BS.B17		2/22/19	1345	СВ	G	so	1		+	-	1	+		1;	x )	$\langle  $	х	х	x	X	x	-				A39
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	10 Business Days					] Come	nercial "B	" (Level 2	,	Č	Ξ.	YASI	P Cate	igory E	3		_										$\sim$
	5 Business Days					] NJ R4	duced (L	evel 3)		0	<b>_</b> •	ia MC	PCr	tteria													21/12/
	3 Business Days'					FullT	ier I (Lev	el 4)		_ [	<u> </u>	TRC	PC	iteria_							11	VITI	AL A	SES	SME	NT.	2400
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Copy of SGS Post Ex Sample COCs Template 20190109

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JC83295: Chain of Custody Page 1 of 4



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5.2 5 Chromium, Hexavalent

Redox Potential Vs H2

pH <sup>a</sup>

Analyte	Result	RL	Units	DF	Analyzed	By Method	
General Chemistry	y						
Project:	PPG Site 107, 18 Cha	apel Avenue	e, Jersey Ci	ty, NJ			
Matrix:	AQ - Field Blank Soi	l			Date Receive Percent Solid	ed: 02/22/19 ls: n/a	
Client Sample ID: Lab Sample ID:	FB(20190222) JC83295-1				Date Sample	<b>d:</b> 02/22/19	

mg/l

mv

su

1

1

1

02/22/19 18:10 DC

02/25/19 09:36 RI

 $02/22/19 \ 16:14 \ \text{SUB} \ \text{SM4500H+ B-11}$ 

0.010

# **Report of Analysis**

Page 1 of 1

SW846 7196A

ASTM D1498-76

< 0.010

481

5.94

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

4.1 **4** 



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		
Concerci Chamister			

#### **General Chemistry**

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent Redex Potential Vs H2	13.2 J-	0.52	mg/kg	1	02/26/19 14:09	NV	SW846 3060A/7196A
Solids, Percent	77.6		111v %	1	02/23/19 13:31	BG	SM2540 G 18TH ED MOD
рН	7.99 J		su	1	02/25/19 13:06	RI	SW846 9045D

#### Page 1 of 1

4.2



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		
C			

#### **General Chemistry**

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	2.8 <b>J</b> -	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

#### Page 1 of 1

4.3



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
Solids. Percent	61.8		111V %	1	02/23/19 13:44	RI BG	ASTM D1498-76M SM2540 G 18TH ED MOD
рН	6.19 <mark>J</mark>		su	1	02/25/19 13:24	RI	SW846 9045D

#### Page 1 of 1

4.4



_		Repo	ort of An	alysis	Page 1 of 1
Client Sample ID: Lab Sample ID: Matrix:	CS-G18 JC83295-2R SO - Soil				Date Sampled: 02/22/19 Date Received: 02/22/19 Percent Solids: 77.6
Project:	PPG Site 107, 18 Ch	apel Avenue	Jersey Cit	y, NJ	
General Chemistry					
Analyte	Result	RL	Units	DF	Analyzed By Method
Chromium, Hexava	lent 116	2.6	mg/kg	5	03/04/19 10:52 RI SW846 3060A/7196A



			Repo	rt of An	alysis			Page 1 of 1
Client Sample ID:	BS-B17	25					02/22/10	
Lab Sample ID:	JC83295	-3R				Date Sampled:	02/22/19	
Matrix:	SO - Son					Date Received:	02/22/19	
Project:	PPG Site	107, 18 Cha	pel Avenue.	Jersey Cit	y, NJ	i ci cent Sonus.	00.0	
General Chemistry	y							
Analyte		Result	RL	Units	DF	Analyzed	By Meth	od
Chromium, Hexava	lent	< 0.58	0.58	mg/kg	1	03/04/19 10:52 1	RI SW846	3060A/7196A



4.2

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			Repor	rt of An	alysis	Page 1 of 1	
Client Sample ID: Lab Sample ID: Matrix:	BS-C18 JC83295-4 SO - Soil	4R				Date Sampled: 02/22/19 Date Received: 02/22/19 Percent Solids: 61.8	4.3
Project:	PPG Site	107, 18 Cha	apel Avenue.	Jersey Cit	y, NJ	Tercent sonus. 01.0	+>
General Chemistry	ý						
Analyte		Result	RL	Units	DF	Analyzed By Method	
Chromium, Hexava	llent	1.3	0.65	mg/kg	1	03/04/19 10:52 RI SW846 3060A/7196A	



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
		<b>Percent Solids:</b>	n/a
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

#### **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 <sup>1</sup>	SW846 3010A <sup>2</sup>
Chromium	< 10	10	ug/l	1	02/25/19	02/25/19 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>
Nickel	< 10	10	ug/l	1	02/25/19	02/25/19 ND	SW846 6010D 1	SW846 3010A <sup>2</sup>
Thallium	< 10	10	ug/l	1	02/25/19	02/25/19 ND	SW846 6010D 1	SW846 3010A <sup>2</sup>
Vanadium	< 50	50	ug/l	1	02/25/19	02/25/19 ND	SW846 6010D 1	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA46199

(2) Prep QC Batch: MP12719



4.4


Client Sample ID: Lab Sample ID: Matrix: Project:	FB(20190 JC83295- AQ - Fiel PPG Site	0222) 1A d Blank Soil 107, 18 Chaj	pel Avenue,	Jersey Cit	y, NJ	Date Sampled Date Received Percent Solids	: 02 : 02 : n/a	/22/19 /22/19 a
General Chemistry								
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivaler	nt <sup>a</sup>	< 0.020	0.020	mg/l	1	02/25/19 17:50	ND	SW846 6010/7196A M

Page 1 of 1

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





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 <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	288	1.3	mg/kg	1	02/25/19	02/25/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	21.5	5.0	mg/kg	1	02/25/19	02/25/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>
Thallium	< 1.3	1.3	mg/kg	1	02/25/19	02/25/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>
Vanadium	19.0	6.3	mg/kg	1	02/25/19	02/25/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA46197

(2) Prep QC Batch: MP12717



4.2 **4** 



10 of 441

Client Sample ID: Lab Sample ID: Matrix: Project:	CS-G18 JC83295- SO - Soil PPG Site	2A 107, 18 Cha	pel Avenue,	Jersey City	y, NJ	Date Sampled: Date Received Percent Solids	02 02 77	/22/19 /22/19 .6
General Chemistry	,							
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivaler	nt <sup>a</sup>	275	1.8	mg/kg	1	02/26/19 14:09	NV	SW846 6010/7196A M

Page 1 of 1

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





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 <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	16.6	1.5	mg/kg	1	02/25/19	02/25/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	14.7	6.1	mg/kg	1	02/25/19	02/25/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>
Thallium	< 1.5	1.5	mg/kg	1	02/25/19	02/25/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>
Vanadium	24.1	7.6	mg/kg	1	02/25/19	02/25/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA46197

(2) Prep QC Batch: MP12717



4.3 **4** 



Project: PPO	- 5011 G Site 107, 18 Cha	pel Avenue	, Jersey Cit	v, NJ	Date Sampled Date Received Percent Solids	: 02 : 02 : 68	/22/19 /22/19 .8
General Chemistry			, <b>.</b>				
Analyte	Result	<b>RL</b>	Units	<b>DF</b>	<b>Analyzed</b>	By	Method

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

4.3





Client Sample ID:	BS-C18		
Lab Sample ID:	JC83295-4A	Date Sampled:	02/22/19
Matrix:	SO - Soil	Date Received:	02/22/19
		<b>Percent Solids:</b>	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 <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	62.3	1.6	mg/kg	1	02/25/19	02/25/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	16.4	6.4	mg/kg	1	02/25/19	02/25/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>
Thallium	< 1.6	1.6	mg/kg	1	02/25/19	02/25/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>
Vanadium	25.9	8.0	mg/kg	1	02/25/19	02/25/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA46197

(2) Prep QC Batch: MP12717



4.4 **4** 



Client Sample ID: Lab Sample ID: Matrix: Project:	BS-C18 JC83295- SO - Soil PPG Site	4A 107, 18 Chaj	pel Avenue,	Jersey City	y, NJ	Date Sampled: Date Received Percent Solids	: 02 : 02 : 61	/22/19 /22/19 .8
General Chemistry								
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivaler	nt <sup>a</sup>	61.7	2.3	mg/kg	1	02/26/19 14:14	NV	SW846 6010/7196A M

Page 1 of 1

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





Client Sample ID: Lab Sample ID: Matrix:	CS-G18 JC83295-2RT SO - Soil				Date Sampl Date Receiv Percent Sol	ed: 02 ved: 02 ids: 77	2/22/19 2/22/19 7.6	
Project:	PPG Site 107, 18 Cha	pel Avenue	e, Jersey Cit	ty, NJ		<b>iu</b> s <b>i</b> , ,		
General Chemistry								
Analyte	Result	RL	Units	DF	Analyzed	By	Method	

1

1

03/18/19 10:20 MP

03/18/19 12:30 MP

03/19/19 23:20 CD

### **Report of Analysis**

Page 1 of 1

ASTM D3872-86

SM4500S2- A-11 R

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.

%

mg/kg

0.20

130

0.42 J

NEGATIVE

183000 J

(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.

Iron, Ferrous <sup>a</sup>

Sulfide Screen<sup>h</sup>

Total Organic Carbon c





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				TEL. 7	32-329- W	0200 FAX: ww.sgs.com	732-329 ehsusa	-3499/	3480				SGS Qu	ote #					SGS Job	ь.ø	J	(83	296
Cli	ent / Reporting Information	_		Projec	t Inform	ation											Reque	sted A	nalysis	· · · ·			Matrix Codes
Company Name	e: 	Project Name:	PP6	h Jorny City S.h. 107									3	2								DW - Drinking Water GW - Ground Water	
Street Address	state Care	City	Chippel	State Company Name									w.w.								SW - Surface Water SO - Soil SL- Sludge SED-Sediment		
Never	- PA 1844	to Jerse Project #	2 C.2	NJ	Street Ad	dress			_				-	4	3								OI - OI LIQ - Other Liquid
Mitt	Bell	NOCK 7	70.000	3	Chi				Cinto			Zio			1								AIR - Air SOL - Other Solid
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SGS Sancie # F	Field ID / Point of Collection	MEOH/DI Vial #	Date	Time	Sampled by	Grab (G) Comp (C) Matrix	# of bottles	₽	NaOH	HNO,	DI Water	MEOH	10	4	Ŧ	۲ ۲	2	F					LAB USE ONLY
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3 51	W-17 11 (2.0-2.5)	15	41119	0355	22	50				++	<u>ا</u>	$\left  \right $	X	X	X	X	X	X	<u>  X</u>				A39
L Ŷ	W- N- 2 (2.0-2.5)	MID	1/22/18	0855	- u	50	1		-	-++	4		<u></u>	X	X	X	X	X	<u>x</u>				(20
Y 51	W-A25 (0.0-0.5)		1/12/10	0105	10	50	1		_	-+-+	1	$\left\{ + + + + + + + + + + + + + + + + + + +$	<u>X</u>	X	X	X	X	X	X		+		
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!	0 Business Days					Commercial	"B" (Level	2)			ASP C	ategory I Criteria	3										
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<b>X</b> <sup>2</sup>	Business Days*					Commercial	"C"		Ì	Sta	te For	ms .	Transf										
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Alida	ta sveilable via Lablink	* Approval needed for	or 1-3 Business (	Day TAT	L		Commercial	61 "C"	Result	its + QC	Summ	ary + Part	al Raw data	Jumma	· · ·				ht	tp://www	v.sgs.com	n/en/term	s-and-conditions
failinguist	la Dati	e/Time:	Sample Received By:	Custody n	nust be d	ocumented be	low each t	Reline	mpier	s changi i By:	pos	session,	Including	courier	delivery	Dete / Ti	me: 15	59	Receive	d By:	1		
4	1 2	12/19 1974	1 Kol	ser	d	aula	ans	2	Kc	ber	1	dra	ule	พร		2.2	2.19		2	<u> </u>	1		
Selfinguished by: 3 Date / Time: Received By: 3						Reline 4	uished	ι By:						Date / Ti	me:		Receive 4	Comments / Special instructions  Comments / Special instructions  AL ASESSMENT SA D  LUB USE INTERPORT					
Relinquishe 5	d by: Dat	e / Time:	Received By: 5					Custo	dy Sea	23	56	14	Intact Not intac	: 1	Preserve Absent	d where a	applicable	Therm. I	ID:		On ke	T 0	3, 20¢

EHSA-QAC-0023-02-FORM-Dayton - Standard COC.xlsx

JC83296: Chain of Custody Page 1 of 3



**5**.2

G



Analyte	Result	RL	Units	DF	Analyzed	By Method	
General Chemistry	<i>i</i>						
Project:	PPG Site 107, 18 Cha	apel Avenue	e, Jersey Ci	ty, NJ	Tereent Son	<b>NS.</b> 11/4	
Matrix:	AQ - Field Blank Soil	l			Date Receiv Percent Soli	ved: 02/22/19 ids: n/a	
Client Sample ID: Lab Sample ID:	FB(20190222)-A JC83296-1				Date Sampl	led: 02/22/19	

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
nH <sup>a</sup>	489		IIIV SU	1	02/22/19 09:39	KI SUB	ASIM D1498-76 SM4500H+ B-11
рп "	4.90		su	1	02/22/19 10:13	SOR	SM4500H+ B-11

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





Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		
		Percent Solids:	83.6
Matrix:	SO - Soil	Date Received:	02/22/19
Lab Sample ID:	JC83296-2	Date Sampled:	02/22/19
Client Sample ID:	SW-A24(0.0-0.5)		

#### **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

### Page 1 of 1

4.2



Client Sample ID:	SW-A24(2.0-2.5)		
Lab Sample ID:	JC83296-3	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	44.5 <b>J</b> -	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 <mark>J</mark>		su	1	02/25/19 11:47	RI	SW846 9045D

### Page 1 of 1

4.3



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 <b>J-</b>	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

### Page 1 of 1

4.4



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 <b>J</b> -	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

### Page 1 of 1

4.5



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		
C			

#### **General Chemistry**

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	14.3 <b>J</b> -	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

### Page 1 of 1

4.6



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
		<b>Percent Solids:</b>	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 <b>J</b> -	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

### Page 1 of 1

4.7





Client Sample ID:	DUP-03(20190222)RR		
Lab Sample ID:	JC83296-8	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	14.0 <b>J</b> -	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

### Page 1 of 1

4.8



-

		Repo	rt of An	alysis	Page 1 of 1
Client Sample ID: Lab Sample ID: Matrix:	SW-A24(0.0-0.5) JC83296-2R SO - Soil				Date Sampled: 02/22/19 Date Received: 02/22/19 Percent Solids: 83.6
Project: General Chemistry	PPG Site 107, 18 Ch	apel Avenue	, Jersey Cit	y, NJ	
Analyte	Result	RL	Units	DF	Analyzed By Method
Chromium, Hexava	lent 48.2	0.96	mg/kg	2	03/04/19 12:29 RI SW846 3060A/7196A

### RL = Reporting Limit



~		Repo	rt of An	alysis	Page 1 of 1
Client Sample ID: Lab Sample ID:	SW-A24(2.0-2.5) JC83296-3R				Date Sampled: 02/22/19
Matrix:	SO - Soil				Date Received: 02/22/19 Percent Solids: 77.5
Project:	PPG Site 107, 18 Cha	pel Avenue	Jersey Cit	y, NJ	
General Chemistry					
Analyte	Result	RL	Units	DF	Analyzed By Method
Chromium, Hexavale	ent 46.2	0.52	mg/kg	1	03/04/19 12:22 RI SW846 3060A/7196A

### RL = Reporting Limit



	Repo	rt of An	alysis		Page 1 of 1
SW-A25(0.0-0.5)					
JC83296-4R				<b>Date Sampled:</b> 02/22/19	)
SO - Soil				<b>Date Received:</b> 02/22/19	
				Percent Solids: 80.6	
PPG Site 107, 18 Ch	apel Avenue	, Jersey Cit	y, NJ		
у					
Result	RL	Units	DF	Analyzed By Met	hod
alent 6.0	0.50	mg/kg	1	03/04/19 12:29 RI SW84	46 3060A/7196A
	SW-A25(0.0-0.5) JC83296-4R SO - Soil PPG Site 107, 18 Ch y Result alent 6.0	SW-A25(0.0-0.5)         JC83296-4R           JC83296-4R         SO - Soil           PPG Site 107, 18 Chapel Avenue         V           g         Result         RL           alent         6.0         0.50	Report of An         SW-A25(0.0-0.5)         JC83296-4R         SO - Soil         PPG Site 107, 18 Chapel Avenue, Jersey City         y         Result       RL       Units         alent       6.0       0.50       mg/kg	Report of Analysis         SW-A25(0.0-0.5)       JC83296-4R         JC83296-4R       SO - Soil         PPG Site 107, 18 Chapel Avenue, Iersey City, NJ         y         g         Result       RL       Units       DF         alent       6.0       0.50       mg/kg       1	Report of Analysis         SW-A25(0.0-0.5)       JC83296-4R       Date Sampled: 02/22/19         SO - Soil       Date Received: 02/22/19         PPG Site 107, 18 Chapel Avenue, Jersey City, NJ       Percent Solids: 80.6         y       Result       RL       Units       DF       Analyzed       By       Methods         alent       6.0       0.50       mg/kg       1       03/04/19 12:29       RI       SW84



4.3 4

			Repo	rt of An	alysis	Page 1 of 1
Client Sample ID: Lab Sample ID:	SW-A25(	2.0-2.5) 5R				Date Sampled · 02/22/19
Matrix:	SO - Soil					Date Received: 02/22/19 Percent Solids: 72 2
Project:	PPG Site	107, 18 Ch	apel Avenue	Jersey Cit	y, NJ	rereation solution 72.2
General Chemistry	7					
Analyte		Result	RL	Units	DF	Analyzed By Method
Chromium, Hexava	lent	71.4	1.1	mg/kg	2	03/04/19 12:29 RI SW846 3060A-7196A

RL = Reporting Limit

~		Repo	rt of An	alysis	Page 1 of 1
Client Sample ID: SW- Lab Sample ID: JC8	A26(0.0-0.5) 3296-6R				<b>Date Sampled:</b> 02/22/19
Matrix: SO	Soll				Date Received: 02/22/19 Percent Solids: 85.0
Project: PPC	Site 107, 18 Cha	pel Avenue	Jersey Cit	y, 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



			Repor	rt of An	alysis		Page 1 of 1
Client Sample ID:	SW-A26(2.0	-2.5)				Data Samplad: 02/22/10	
Matrix:	SO - Soil					<b>Date Sampled:</b> 02/22/19 <b>Date Received:</b> 02/22/19	, )
Project:	PPG Site 107	, 18 Chapel	Avenue,	Jersey City	y, NJ	Percent Solids: 72.1	
General Chemistr	·y						
Analyte	Re	esult	RL	Units	DF	Analyzed By Met	hod
Chromium, Hexav	valent 33	.9	0.55	mg/kg	1	03/04/19 12:29 RI SW84	46 3060A/7196A



4.6

		Repo	rt of An	alysis	Page 1 of 1	
Client Sample ID:	DUP-03(20190222)R	R				4
Lab Sample ID:	JC83296-8R				<b>Date Sampled:</b> 02/22/19	
Matrix:	SO - Soil				<b>Date Received:</b> 02/22/19	
					Percent Solids: 72.9	4
Project:	PPG Site 107, 18 Cha	apel Avenue	, Jersey Cit	y, NJ		
General Chemistr	y					
Analyte	Result	RL	Units	DF	Analyzed By Method	
Chromium, Hexava	alent 16.4	0.55	mg/kg	1	03/04/19 12:29 RI SW846 3060A/7196A	



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
		<b>Percent Solids:</b>	n/a
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

# **Report of Analysis**

### **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 <sup>1</sup>	SW846 3010A <sup>2</sup>
Chromium	< 10	10	ug/l	1	02/25/19	02/25/19 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>
Nickel	< 10	10	ug/l	1	02/25/19	02/25/19 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>
Thallium	< 10	10	ug/l	1	02/25/19	02/25/19 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>
Vanadium	< 50	50	ug/l	1	02/25/19	02/25/19 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA46199

(2) Prep QC Batch: MP12719



4





Client Sample ID: Lab Sample ID: Matrix: Project:	FB(20190222)-ADate Sampled:02/22/19JC83296-1ADate Received:02/22/19AQ - Field Blank SoilDate Received:02/22/19PPG Site 107, 18 Chapel Avenue, Jersey City, NJn/a							
General Chemistry								
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivaler	nt <sup>a</sup>	< 0.020	0.020	mg/l	1	02/25/19 17:56	ND	SW846 6010/7196A M

Page 1 of 1

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





Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		
		Percent Solids:	83.6
Matrix:	SO - Soil	Date Received:	02/22/19
Lab Sample ID:	JC83296-2A	Date Sampled:	02/22/19
Client Sample ID:	SW-A24(0.0-0.5)		

# **Report of Analysis**

#### **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 <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	22.9 J	1.1	mg/kg	1	02/25/19	02/25/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	19.5	4.6	mg/kg	1	02/25/19	02/25/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Thallium	< 1.1	1.1	mg/kg	1	02/25/19	02/25/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Vanadium	24.4	5.7	mg/kg	1	02/25/19	02/25/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA46197

(2) Prep QC Batch: MP12717



4.2 **4** 



Client Sample ID: Lab Sample ID: Matrix: Project:	SW-A24( JC83296- SO - Soil PPG Site	0.0-0.5) ·2A 107, 18 Cha	ipel Avenue,	Jersey Cit	y, NJ	Date Sampled Date Received Percent Solids	: 02 : 02 : 83	/22/19 /22/19 .6	
General Chemistry	General Chemistry								
Analyte		Result	RL	Units	DF	Analyzed	By	Method	
Chromium, Trivaler	nt <sup>a</sup>	19.9	1.6	mg/kg	1	02/26/19 14:17	DC	SW846 6010/7196A M	

Page 1 of 1

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



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 <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	743 <mark>J</mark>	1.3	mg/kg	1	02/25/19	02/25/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	62.0	5.1	mg/kg	1	02/25/19	02/25/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Thallium <sup>a</sup>	< 2.5	2.5	mg/kg	2	02/25/19	02/25/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Vanadium	85.0	6.3	mg/kg	1	02/25/19	02/25/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA46197

(2) Prep QC Batch: MP12717

(a) Elevated detection limit due to dilution required for high interfering element.

Page 1 of 1





Client Sample ID: Lab Sample ID: Matrix: Project:	SW-A24( JC83296- SO - Soil PPG Site	2.0-2.5) 3A 107, 18 Cha	pel Avenue,	Jersey City	Date Sampled: Date Received Percent Solids	02 02 77	/22/19 /22/19 .5		
General Chemistry	General Chemistry								
Analyte		Result	RL	Units	DF	Analyzed	By	Method	
Chromium, Trivaler	nt <sup>a</sup>	699	1.8	mg/kg	1	02/26/19 14:10	DC	SW846 6010/7196A M	

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



4.3 4

Page 1 of 1

**Report of Analysis** 

SGS LabLink@1042801 15:27 14-Jun-2019

Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		
		Percent Solids:	80.6
Matrix:	SO - Soil	Date Received:	02/22/19
Lab Sample ID:	JC83296-4A	Date Sampled:	02/22/19
Client Sample ID:	SW-A25(0.0-0.5)		

# **Report of Analysis**

#### **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 <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	191 <mark>J</mark>	1.2	mg/kg	1	02/25/19	02/25/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	39.6	4.8	mg/kg	1	02/25/19	02/25/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Thallium	< 1.2	1.2	mg/kg	1	02/25/19	02/25/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Vanadium	54.5	6.0	mg/kg	1	02/25/19	02/25/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA46197

(2) Prep QC Batch: MP12717



4.4 **4** 



Client Sample ID: Lab Sample ID: Matrix: Project:	SW-A25( JC83296- SO - Soil PPG Site	ipel Avenue,	Date Sampled Date Received Percent Solids	: 02 : 02 : 80	/22/19 /22/19 .6			
General Chemistry								
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivaler	nt <sup>a</sup>	184	1.7	mg/kg	1	02/26/19 14:17	DC	SW846 6010/7196A M

Page 1 of 1

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





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 <b>J</b> -	2.7	mg/kg	1	02/25/19	02/25/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	181 <mark>J</mark>	1.3	mg/kg	1	02/25/19	02/25/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>
Nickel	34.5	5.3	mg/kg	1	02/25/19	02/25/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>
Thallium <sup>a</sup>	< 2.7	2.7	mg/kg	2	02/25/19	02/25/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>
Vanadium	38.5	6.7	mg/kg	1	02/25/19	02/25/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA46197

(2) Prep QC Batch: MP12717

(a) Elevated detection limit due to dilution required for high interfering element.

Page 1 of 1





Client Sample ID:SW-A25(2.0-2.5)Lab Sample ID:JC83296-5AMatrix:SO - SoilProject:PPG Site 107, 18 Chapel ArCanonal Chamictary			apel Avenue,	, Jersey Cit <u>y</u>	y, NJ	Date Sampled Date Received Percent Solids	: 02 : 02 : 72	/22/19 /22/19 .2
General Chemistry								
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivaler	nt <sup>a</sup>	167	1.9	mg/kg	1	02/26/19 14:17	DC	SW846 6010/7196A M

Page 1 of 1

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





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 <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	748 J	1.1	mg/kg	1	02/25/19	02/25/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	126	4.5	mg/kg	1	02/25/19	02/25/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Thallium <sup>a</sup>	< 5.6	5.6	mg/kg	5	02/25/19	02/25/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Vanadium	223	5.6	mg/kg	1	02/25/19	02/25/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA46197

(2) Prep QC Batch: MP12717

(a) Elevated detection limit due to dilution required for high interfering element.

Page 1 of 1





General Chemistry	Client Sample ID:SW-A26(0.0-0.5)Lab Sample ID:JC83296-6AMatrix:SO - SoilProject:PPG Site 107, 18 Chapel Avenue, JerseyGeneral Chemistry				, Jersey Cit	y, NJ	Date Sampled: Date Received Percent Solids	: 02 : 02 : 85	/22/19 /22/19 .0
	General Chemistry								
	Chromium, Trivaler	nt <sup>a</sup>	734	1.6	mg/kg	1	02/26/19 14:17	DC	SW846 6010/7196A M

Page 1 of 1

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




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 <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	920 J	1.4	mg/kg	1	02/25/19	02/25/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>
Nickel	154	5.5	mg/kg	1	02/25/19	02/25/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>
Thallium <sup>a</sup>	< 2.7	2.7	mg/kg	2	02/25/19	02/25/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>
Vanadium	283	6.9	mg/kg	1	02/25/19	02/25/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA46197

(2) Prep QC Batch: MP12717

(a) Elevated detection limit due to dilution required for high interfering element.

Page 1 of 1





Client Sample ID: Lab Sample ID: Matrix: Project:	SW-A26( JC83296- SO - Soil PPG Site	2.0-2.5) 7A 107, 18 Cha	pel Avenue,	Jersey City	, NJ	Date Sampled Date Received Percent Solids	: 02 : 02 : 72	/22/19 /22/19 .1
General Chemistry								
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivaler	nt <sup>a</sup>	877	2.0	mg/kg	1	02/26/19 14:17	DC	SW846 6010/7196A M

Page 1 of 1

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





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		

# **Report of Analysis**

#### **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 <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	177 J	1.3	mg/kg	1	02/25/19	02/25/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	28.8	5.4	mg/kg	1	02/25/19	02/25/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Thallium	< 1.3	1.3	mg/kg	1	02/25/19	02/25/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Vanadium	33.0	6.7	mg/kg	1	02/25/19	02/25/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA46197

(2) Prep QC Batch: MP12717



4.8



Client Sample ID: Lab Sample ID: Matrix: Project: General Chemistry	DUP-03(2 JC83296- SO - Soil PPG Site	20190222)RF 8A 107, 18 Cha	R pel Avenue,	Jersey City	7, NJ	Date Sampled Date Received Percent Solids	: 02 : 02 : 72	/22/19 /22/19 .9
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivaler	nt <sup>a</sup>	163	1.9	mg/kg	1	02/26/19 14:17	DC	SW846 6010/7196A M

Page 1 of 1

4.8

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



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I			TEL.	32-329-1 W	0200 vw.sgs	FAX: 7 .com/e	732-329- hsusa	3499/	3480					SGS Que	te #					SGS Job	JC 8	331	17
Client / Reporting Information	n		Projec	t Inform:	ation												-	Reques	ted An	alysis			Matrix Codes
mpany Name:	Project Name			~ .		~ /-	10	2															DW - Drinking Wate
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ss Field ID / Point of Collection	MEOH/DI Viel	Date	Time	Sampled by	Grab (G) Comp (C)	Matrix	# of bottles	Ŷ	Qay O	OS'H	NON	WEO	ENCI			~		~		-			LAB USE ONLY
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EHSA-QAC-0023-02-FORM-Dayton - Standard COC.xtsx

JC83377: Chain of Custody Page 1 of 3



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5.2

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JC83377

< 0.010

458

5.52

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

Chromium, Hexavalent

Redox Potential Vs H2

pH <sup>a</sup>

Client Sample ID: Lab Sample ID:	FB(20190225) JC83377-1				Date Sampl	ed: 02/	25/19	
Matrix: Project:	AQ - Field Blank Soi PPG Site 107, 18 Ch	l apel Avenue	e, Jersey Ci	ty, NJ	Date Receiv Percent Sol	v <b>ed:</b> 02/ ids: n/a	25/19	
General Chemistry	7							
Analyte	Result	RL	Units	DF	Analyzed	By	Method	

mg/l

mv

su

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1

1

02/25/19 22:36 јо

02/26/19 10:09 RI

02/25/19 17:30 AS

0.010

# **Report of Analysis**

Page 1 of 1

SW846 7196A

ASTM D1498-76

SM4500H+ B-11

4.4



Client Sample ID:	BS-B3		
Lab Sample ID:	JC83377-2	Date Sampled:	02/25/19
Matrix:	SO - Soil	Date Received:	02/25/19
		<b>Percent Solids:</b>	85.2
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		
Conoral Chamistry			

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	1.9 <b>J-</b>	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

4.2

4



SGS

		Repo	rt of An	alysis		Page 1 of 1
BS-B3						
JC83377	-2R				<b>Date Sampled:</b> 02/25/19	
SO - Soil					<b>Date Received:</b> 02/25/19	
					Percent Solids: 85.2	
PPG Site	e 107, 18 Cha	apel Avenue	Jersey Cit	y, NJ		
y						
	Result	RL	Units	DF	Analyzed By Meth	od
	BS-B3 JC83377 SO - Soi PPG Site	BS-B3 JC83377-2R SO - Soil PPG Site 107, 18 Cha	Report BS-B3 JC83377-2R SO - Soil PPG Site 107, 18 Chapel Avenue W Result RL	Report of An BS-B3 JG83377-2R SO - Soil PPG Site 107, 18 Chapel Avenue, Jersey City Result RL Units	Report of Analysis   BS-B3 JC83377-2R   JC83377-2R SO - Soil   PPG Site 107, 18 Chapel Avenue, Jersey City, NJ   W Result RL Units DF	Report of Analysis   BS-B3 JC833377-2R Date Sampled: 02/25/19   SO - Soil Date Received: 02/25/19   PPG Site 107, 18 Chapel Avenue, Jersey City, NJ Percent Solids: 85.2   W Result RL Units DF Analyzed By Meth



4.1 4

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
		<b>Percent Solids:</b>	n/a
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

# **Report of Analysis**

## **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 <sup>1</sup>	SW846 3010A <sup>2</sup>
Chromium	< 10	10	ug/l	1	02/26/19	02/26/19 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>
Nickel	< 10	10	ug/l	1	02/26/19	02/26/19 ND	SW846 6010D 1	SW846 3010A <sup>2</sup>
Thallium	< 10	10	ug/l	1	02/26/19	02/26/19 ND	SW846 6010D 1	SW846 3010A <sup>2</sup>
Vanadium	< 50	50	ug/l	1	02/26/19	02/26/19 ND	SW846 6010D 1	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA46212

(2) Prep QC Batch: MP12737



4



Client Sample ID: Lab Sample ID: Matrix: Project:	FB(20190 JC83377- AQ - Fiel PPG Site	0225) 1A d Blank Soil 107, 18 Chaj	pel Avenue,	Jersey Cit	y, NJ	Date Sampled Date Received Percent Solids	: 02 : 02 : n/a	/25/19 /25/19 a		
General Chemistry	General Chemistry									
Analyte		Result	RL	Units	DF	Analyzed	By	Method		
Chromium, Trivaler	nt <sup>a</sup>	< 0.020	0.020	mg/l	1	02/26/19 16:17	ND	SW846 6010/7196A M		

Page 1 of 1

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



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 <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	34.0	1.2	mg/kg	1	02/26/19	02/26/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	13.2	4.7	mg/kg	1	02/26/19	02/26/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Thallium	< 1.2	1.2	mg/kg	1	02/26/19	02/26/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Vanadium	32.5	5.9	mg/kg	1	02/26/19	02/26/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA46212

(2) Prep QC Batch: MP12733



4.2 **4** 



Client Sample ID: Lab Sample ID: Matrix: Project:	BS-B3 JC83377- SO - Soil PPG Site	-2A 107, 18 Cha	apel Avenue,	Jersey Cit	y, NJ	Date Sampled Date Received Percent Solids	: 02 : 02 : 85	/25/19 /25/19 .2
General Chemistry								
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivaler	nt <sup>a</sup>	32.1	1.7	mg/kg	1	02/26/19 16:50	DC	SW846 6010/7196A M

Page 1 of 1

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







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						w.sgs	.com/et	susa					_		_							R	n	-0	11	119-161
Company	Client / Reporting Information	Project Name		Projec	t Inform	ation			_						Requested Analysis					T T	Matrix Codes					
Arca	dis	PPG Site 10	07 (Jersey Ci	ty)																	1					DW - Drinking Water
Street A	dress	Street					_		_	_	_			_	_			1								GW - Ground Weter WW - Weter
10 F	riends Lane, Suite 200	18 Chapel /	Avenue		Billing In	ing Information (If different from Report to)															SW - Surface Weter SO - Soil					
City	State Zip	40 Jersev City	,	State	Company	Name																				SL-Sludge SED-Sediment
Project (	ontact E-mail	Project #			Street Adv	dress								-	-											OI - Oil LIQ - Other Liquid
Matth	ew Bol	NP000770.0	0001			_							_						l l							AIR - Air SOL - Other Solid
Phone # 610	755 7080	Client Purchas	e Order #		City					State			2	ι <b>ρ</b>			ε	i i				1				WP - Wipe FB - Field Black
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505	Field ID / Point of Collection	MECHVICE Visi #	Date	Time	Sampled	Grab (G) Coma (C)	Matrix	# of bottles	₫	HO III	8 3	NONE	X Wet	NCO	11	Total	Hexa	Triva	Antin	Nicke	Thak	Vana				LAB USE ONLY
1	FB(20190226)-A		2/26/19	0900	cc	G	FB	1	Ê	-	1	1	-	+	H	x	x	x	x	x	x	x	+	+	$\vdash$	Did due diter
2	SW-427(0.0-0.5)		2/26/19	0945	CC	G	So	1		-	+	11	+	+		x	x	x	×	x	x	1 x	+	+		_
2	OW A27(2.0.2.5)		2/26/10	0055	00	6	80		-		+	11	+	+	H	¥	T Y	×	×	Ŷ	Ŷ	÷		+	$\left  - \right $	
2	SH-A27(2.0-2.5)		2/20/10	1005	00	6	60	÷	+	$\left  \right $	+	+-+	+	+	H	÷	1 <del>,</del>	÷	÷	t÷	÷	+÷	+-	+		- 04
4 E	SW-A28(0.0-0.5)		2/20/19	1005	00	6					+	H	+	+	H	÷	Ê	ŀ÷	÷	1÷	+÷	÷	-	+		019
2	SW-A28(2.0-2.5)		2/20/19	1015	00	6		<u> </u>	-			+:+	+	+	H	÷	t.	÷	÷	÷	+÷	÷		+		- AS1
9	SW-A29(0.0-0.5)		2/20/19	1025	00	0	80			-	+	+:+	+	+	H	÷	÷	÷	÷	+÷	÷	-÷	+	+	+	08
-	SW-A29(0.0-0.5)		2/26/19	1035	u.	G	30				-	+ +	+	+	+	<u>-</u>	Ê	⊢ <u>^</u>	-	<u>^</u>	<u> </u>	<u> </u>	+	+	+	_
51	SW-A28(2.0-2.5) MS		2/26/19	1015	cc	G	So	1	-		+	11	+	+-	11	_ <u>×</u>	X	X	X	X	X	<u>×</u>	+	+	+	
	SW-A28(2.0-2.5) MS		2/26/19	1015	cc	G	So	1			_	11	-	+	$\square$	<u>×</u>	X	X	X	X	×	X	-			
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INITIAL ASESSMENT LABEL VIEW LABEL VERIFICATION

SGS Post Ex Sample COCs Template 20190109

JC83434: Chain of Custody Page 1 of 5



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Chromium, Hexavalent

Analyte	Result	RL	Units	DF	Analyzed	By	Method	
General Chemistry	7							
Project:	PPG Site 107, 18 Cha	pel Avenue	e, Jersey Ci	ty, NJ	I ciccit Sol	ius. 11/ c	ı	
Matrix:	AQ - Field Blank Soil				Date Receiv	ved: 02	/26/19	
Client Sample ID: Lab Sample ID:	FB(20190226)-A IC83434-1				Date Samnl	ed: 02	/26/19	

mg/l

1

0.010

# **Report of Analysis**

02/26/19 21:55 јо

02/27/19 15:36 RI

02/26/19 17:10 AS

Page 1 of 1

SW846 7196A

ASTM D1498-76

SM4500H+ B-11

Redox Potential Vs H2	730	mv	1
pH <sup>a</sup>	5.89	su	1

< 0.010

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



4



L			
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		
		Percent Solids:	81.0
Matrix:	SO - Soil	Date Received:	02/26/19
Lab Sample ID:	JC83434-2	Date Sampled:	02/26/19
Client Sample ID:	SW-A27(0.0-0.5)		

# **Report of Analysis**

#### **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

## Page 1 of 1

4.2



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		
			,

# **Report of Analysis**

## **General Chemistry**

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	1.4 <mark>J</mark>	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

## Page 1 of 1

4.3



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		

# **Report of Analysis**

## **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

## Page 1 of 1

4.4



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		

# **Report of Analysis**

## **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

## Page 1 of 1

4.5



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		
			,

# **Report of Analysis**

## **General Chemistry**

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent Redox Potential Vs H2	5.6 J 450	0.52	mg/kg mv	1 1	03/01/19 15:33 02/27/19 17:03	RI RI	SW846 3060A/7196A ASTM D1498-76M
Solids, Percent	77.3		%	1	02/27/19 16:00	SF	SM2540 G 18TH ED MOD
рп	1.21		su	1	02/27/19 10:01	KI	2M 840 9042D

## Page 1 of 1

4.6



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		

# **Report of Analysis**

## **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

## Page 1 of 1

4.7



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	02/2//1917:19	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

## Page 1 of 1

4.8



_		Repo	ort of An	alysis	Page 1 of 1
Client Sample ID: SW-4 Lab Sample ID: JC83 Matrix: SO -	A27(0.0-0.5) 434-2R Soit				Date Sampled: 02/26/19 Date Received: 02/26/19 Percent Solids: 81.0
Project: PPG General Chemistry	Site 107, 18 Cha	npel Avenue	e, Jersey Cit	y, NJ	reitent sonds. 81.0
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



~		Repo	rt of An	alysis	Page	l of 1
Client Sample ID: SW	V-A27(2.0-2.5)					
Lab Sample ID: K	83434-3R				<b>Date Sampled:</b> 02/26/19	
Matrix: SC	) - Soil				<b>Date Received:</b> 02/26/19	
					Percent Solids: 87.0	
Project: PF	G Site 107, 18 Cha	apel Avenue	, Jersey Cit	y, 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/7	196A



4.2

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		Repo	rt of An	alysis	Page 1 of 1
Client Sample ID:	SW-A28(0.0-0.5)				
Lab Sample ID:	JC83434-4R				Date Sampled: 02/26/19
Matrix:	SO - Soil				<b>Date Received:</b> 02/26/19
					Percent Solids: 83.5
Project:	PPG Site 107, 18 Chap	pel Avenue	, Jersey Cit	y, NJ	· · · · · · · · · · · · · · · · · · ·
General Chemistry	7				
Analyte	Result	RL	Units	DF	Analyzed By Method
Chromium, Hexava	lent 3.2	0.48	mg/kg	1	03/09/19 14:01 RI SW846 3060A/7196A



		Repo	rt of An	alysis	Paş	ge 1 of 1
Client Sample ID:	SW-A28(2.0-2.5)					
Lab Sample ID:	JC83434-5R				<b>Date Sampled:</b> 02/26/19	
Matrix:	SO - Soil				<b>Date Received:</b> 02/26/19	
					Percent Solids: 88.9	
Project:	PPG Site 107, 18 Cl	napel Avenue	, Jersey Cit	y, NJ		
General Chemistry	ÿ					
Analyte	Result	RL	Units	DF	Analyzed By Method	
Chromium, Hexava	llent 0.92	0.45	mg/kg	1	03/09/19 13:57 RI SW846 3060	A/7196A

RL = Reporting Limit





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		Repo	rt of An	alysis		Page 1 of 1
Client Sample ID:	SW-A29(0.0-0.5)					
Lab Sample ID:	JC83434-6R				<b>Date Sampled:</b> 02/26	5/19
Matrix:	SO - Soil				Date Received: 02/26	/19
					Percent Solids: 77.3	
Project:	PPG Site 107, 18	Chapel Avenue	Jersey Cit	y, NJ		
General Chemistry	Ŷ					
Analyte	Result	RL	Units	DF	Analyzed By M	lethod
Chromium, Hexava	dent 5.3	0.52	mg/kg	1	03/09/19 14:01 ri s	W846 30 <del>60</del> A/7196A



			Repo	rt of An	alysis	Page 1 of 1
Client Sample ID: Lab Sample ID: Matrix:	SW-A29 JC83434 SO - Soil	(2.0-2.5) -7R				<b>Date Sampled:</b> 02/26/19 <b>Date Received:</b> 02/26/19
Project: General Chemistry	PPG Site	107, 18 Ch	apel Avenue	, Jersey Cit	y, NJ	Percent Solids: 86.1
Analyte		Result	RL	Units	DF	Analyzed By Method
Chromium, Hexava	lent	< 0.46	0.46	mg/kg	1	03/09/19 14:01 RI SW846 3060A/7196A



-

		Repo	rt of An	alysis	Page 1 of 1
Client Sample ID: Lab Sample ID:	DUP-04(20190226)RR	R			Date Sampled: 02/26/19
Matrix:	SO - Soil	_			Date Received: 02/26/19 Percent Solids: 85.9
Project:	PPG Site 107, 18 Chap	pel Avenue	Jersey Cit	y, NJ	
General Chemistry	7				
Analyte	Result	RL	Units	DF	Analyzed By Method
Chromium, Hexava	lent 0.49	0.47	mg/kg	1	03/09/19 14:01 ri sw846 3060a/7196a



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		

# **Report of Analysis**

## **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 <sup>1</sup>	SW846 3010A <sup>2</sup>
Chromium	< 10	10	ug/l	1	02/27/19	02/27/19 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>
Nickel	< 10	10	ug/l	1	02/27/19	02/27/19 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>
Thallium	< 10	10	ug/l	1	02/27/19	02/27/19 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>
Vanadium	< 50	50	ug/l	1	02/27/19	02/27/19 ND	SW846 6010D 1	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA46218

(2) Prep QC Batch: MP12750



4



Client Sample ID: Lab Sample ID: Matrix: Project:	FB(20190 JC83434- AQ - Fiel PPG Site	0226)-A 1A ld Blank Soil 107, 18 Chaj	pel Avenue,	Jersey Cit	y, NJ	Date Sampled Date Received Percent Solids	: 02 : 02 : n/	:/26/19 :/26/19 a	
General Chemistry	General Chemistry								
Analyte		Result	RL	Units	DF	Analyzed	By	Method	
Chromium, Trivaler	nt <sup>a</sup>	< 0.020	0.020	mg/l	1	02/27/19 16:19	ND	SW846 6010/7196A M	

Page 1 of 1

44

4

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





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 <b>J</b> -	2.4	mg/kg	1	02/26/19	02/27/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	286	1.2	mg/kg	1	02/26/19	02/27/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	42.0	4.8	mg/kg	1	02/26/19	02/27/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>
Thallium <sup>a</sup>	< 2.4	2.4	mg/kg	2	02/26/19	02/27/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>
Vanadium	40.5	6.1	mg/kg	1	02/26/19	02/27/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA46218

(2) Prep QC Batch: MP12752

(a) Elevated detection limit due to dilution required for high interfering element.







Client Sample ID: Lab Sample ID: Matrix: Project:	SW-A27( JC83434- SO - Soil PPG Site	(0.0-0.5) -2A 107, 18 Cha	Jersey City	y, NJ	Date Sampled: Date Received Percent Solids	: 02, : 02, : 81	/26/19 /26/19 .0	
Analyte		Result	RL	Units	DF	Analyzed	Bv	Method
Chromium, Trivaler	nt <sup>a</sup>	279	1.7	mg/kg	1	03/01/19 15:33	RI	SW846 6010/7196A M

Page 1 of 1

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





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
		<b>Percent Solids:</b>	87.0
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

# **Report of Analysis**

#### **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 <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	16.6	1.2	mg/kg	1	02/26/19	02/27/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	14.3	4.7	mg/kg	1	02/26/19	02/27/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Thallium	< 1.2	1.2	mg/kg	1	02/26/19	02/27/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Vanadium	23.5	5.9	mg/kg	1	02/26/19	02/27/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA46218

(2) Prep QC Batch: MP12752



4.3 **4** 



Client Sample ID: Lab Sample ID: Matrix: Project:	SW-A27( JC83434- SO - Soil PPG Site	(2.0-2.5) -3A 107, 18 Cha	npel Avenue,	Date Sampled: Date Received Percent Solids	02, 02, 87	/26/19 /26/19 .0		
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivaler	nt <sup>a</sup>	15.2	1.7	mg/kg	1	03/01/19 15:33	RI	SW846 6010/7196A M

Page 1 of 1

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





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		

# **Report of Analysis**

#### **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 <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	227	1.2	mg/kg	1	02/26/19	02/27/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	24.3	4.7	mg/kg	1	02/26/19	02/27/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>
Thallium	< 1.2	1.2	mg/kg	1	02/26/19	02/27/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>
Vanadium	41.3	5.8	mg/kg	1	02/26/19	02/27/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA46218

(2) Prep QC Batch: MP12752



4.4 **4** 



Client Sample ID: Lab Sample ID: Matrix: Project:	SW-A28( JC83434- SO - Soil PPG Site	(0.0-0.5) -4A 107, 18 Cha	apel Avenue,	Jersey Cit	y, NJ	Date Sampled Date Received Percent Solids	02 02 83	/26/19 /26/19 .5	
General Chemistry									
Analyte		Result	RL	Units	DF	Analyzed	By	Method	
Chromium, Trivaler	nt <sup>a</sup>	214	1.7	mg/kg	1	03/01/19 15:33	RI	SW846 6010/7196A M	

Page 1 of 1

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






#### SGS LabLink@1042801 15:30 14-Jun-2019

Client Sample ID:	SW-A28(2.0-2.5)	Data Samnlad:	02/26/19	
Lab Sample ID.	JC03434-JA	Date Sampleu.	02/20/19	
Matrix:	SO - Soil	Date Received:	02/26/19	
		Percent Solids:	88.9	
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ			

# **Report of Analysis**

#### **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 <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	15.3	1.1	mg/kg	1	02/26/19	02/27/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	13.1	4.3	mg/kg	1	02/26/19	02/27/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Thallium	< 1.1	1.1	mg/kg	1	02/26/19	02/27/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Vanadium	25.1	5.4	mg/kg	1	02/26/19	02/27/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA46218

(2) Prep QC Batch: MP12752



4.5 **4** 



Client Sample ID: Lab Sample ID: Matrix: Project: General Chemistry	SW-A28( JC83434- SO - Soil PPG Site	2.0-2.5) 5A 107, 18 Cha	pel Avenue,	Jersey City	7, NJ	Date Sampled Date Received Percent Solids	: 02, : 02, : 88,	/26/19 /26/19 .9
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivaler	it <sup>a</sup>	14.3	1.6	mg/kg	1	03/01/19 15:26	RI	SW846 6010/7196A M

Page 1 of 1

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







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 <b>J</b> -	2.5	mg/kg	1	02/26/19	02/27/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	146	1.2	mg/kg	1	02/26/19	02/27/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	23.7	4.9	mg/kg	1	02/26/19	02/27/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Thallium <sup>a</sup>	< 2.5	2.5	mg/kg	2	02/26/19	02/27/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Vanadium	29.8	6.2	mg/kg	1	02/26/19	02/27/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA46218

(2) Prep QC Batch: MP12752

(a) Elevated detection limit due to dilution required for high interfering element.

Page 1 of 1





Client Sample ID: Lab Sample ID: Matrix: Project: General Chemistry	SW-A29( JC83434- SO - Soil PPG Site	0.0-0.5) 6A 107, 18 Cha	pel Avenue,	Date Sampled: Date Received Percent Solids	02/ : 02/ : 77/	/26/19 /26/19 .3		
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivaler	nt <sup>a</sup>	140	1.7	mg/kg	1	03/01/19 15:33	RI	SW846 6010/7196A M

Page 1 of 1

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





#### SGS LabLink@1042801 15:30 14-Jun-2019

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
		<b>Percent Solids:</b>	86.1
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

# **Report of Analysis**

#### **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 <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	17.2	1.1	mg/kg	1	02/26/19	02/27/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	12.0	4.5	mg/kg	1	02/26/19	02/27/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Thallium	< 1.1	1.1	mg/kg	1	02/26/19	02/27/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Vanadium	22.3	5.6	mg/kg	1	02/26/19	02/27/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA46218

(2) Prep QC Batch: MP12752



4.7 4



22 of 147

JC83434A

Client Sample ID: Lab Sample ID: Matrix: Project: General Chemistry	SW-A29( JC83434- SO - Soil PPG Site	2.0-2.5) 7A 107, 18 Cha	pel Avenue,	Jersey Cit	y, NJ	Date Sampled: Date Received Percent Solids	: 02 : 02 : 86	/26/19 /26/19 .1
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivaler	nt <sup>a</sup>	16.4	1.6	mg/kg	1	03/01/19 15:33	RI	SW846 6010/7196A M

Page 1 of 1

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





#### SGS LabLink@1042801 15:30 14-Jun-2019

Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		
		Percent Solids:	85.9
Matrix:	SO - Soil	Date Received:	02/26/19
Lab Sample ID:	JC83434-8A	Date Sampled:	02/26/19
Client Sample ID:	DUP-04(20190226)RR		

# **Report of Analysis**

#### **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 <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	20.2	1.1	mg/kg	1	02/26/19	02/27/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	12.1	4.4	mg/kg	1	02/26/19	02/27/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Thallium	< 1.1	1.1	mg/kg	1	02/26/19	02/27/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>
Vanadium	22.8	5.5	mg/kg	1	02/26/19	02/27/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA46218

(2) Prep QC Batch: MP12752



4.8



Client Sample ID: Lab Sample ID: Matrix: Project:	ID:   DUP-04(20190226)RR     D::   JC83434-8A     SO - Soil   Date Sampled:   02/26/19     PPG Site 107, 18 Chapel Avenue, Jersey City, NJ   Percent Solids:   85.9							
General Chemistry								
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivaler	nt <sup>a</sup>	20.2	1.6	mg/kg	1	03/01/19 15:33	RI	SW846 6010/7196A M

Page 1 of 1

4.8

4

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





**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:

				Sample		Analysis		
SDG	Sample ID	Lab ID	Matrix	Collection Date	Parent Sample	Cr VI	MET	MISC
	FB(20190227)-A	JC83511-1	Water	2/27/2019		Х	Х	Х
	SW-A22(0.0-0.5)	JC83511-2	Soil	2/27/2019		х	Х	х
	SW-A22(2.0-2.5)	JC83511-2	Soil	2/27/2019		х	Х	х
JC83511	SW-A23(0.0-0.5)	JC83511-4	Soil	2/27/2019		х	Х	Х
	SW-A23(2.0-2.5)	JC83511-5	Soil	2/27/2019		х	Х	Х
	107_M024N_1	JC83511-6	Soil	2/27/2019		Х	Х	х
	107_M034N	JC83511-7	Soil	2/27/2019		Х	Х	Х
JC83512	FB(20190227)	JC83512-1	Water	2/27/2019		Х	Х	Х
	107_K032	JC83512-2	Soil	2/27/2019		х	Х	Х
	BS-C17S	JC83512-3	Soil	2/27/2019		х	Х	х
1000500	FB(20190228)	JC83593-1	Water	2/28/2019		Х	Х	Х
JC83593	BS-C17TT	JC83593-2	Soil	2/28/2019		х	Х	Х
	FB(20190301)	JC83681-1	Water	3/1/2019		х	Х	Х
	BS-B2	JC83681-2	Soil	3/1/2019		х	Х	Х
JC83681	BS-D18	JC83681-3	Soil	3/1/2019		Х	Х	х
	BS-D17T	JC83681-4	Soil	3/1/2019		Х	Х	Х
	FB(20190304)	JC83762-1	Water	3/4/2019		х	Х	Х
1000700	BS-E18	JC83762-2	Soil	3/4/2019		Х	Х	Х
JC83762	BS-E17	JC83762-3	Soil	3/4/2019		Х	Х	Х
	CS-F18	JC83762-4	Soil	3/4/2019		Х	Х	Х

#### 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.

 <u>SDGs #JC83511, JC83512, JC83593, JC83681, and JC83762</u>: 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.

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

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
	Water	180 days from collection to analysis	Preserved to a pH of less than 2; Cool to <6°C
SW-846 6010C	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  $\pm$  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

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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		orted	Perfor Acce	mance ptable	Not		
	No	Yes	No	Yes	Required		
Inductively Coupled Plasma-Atomic Emission Spectromet	ry (ICP-AE	S)					
Tier II Validation	Tier II Validation						
Holding Times		x		Х			
Reporting limits (units)		x		Х			
Blanks							
A. Instrument Blanks		x		Х			
B. Method Blanks		x		Х			
C. Equipment/Field Blanks		х		Х			
Laboratory Control Sample (LCS)		x		Х			
Laboratory Control Sample Duplicate (LCSD)	Х				Х		
LCS/LCSD Precision (RPD)	Х				Х		
Matrix Spike (MS) %R	Х				Х		
Matrix Spike Duplicate (MSD) %R	Х				Х		
MS/MSD Precision (RPD)	Х				Х		
Field/Lab Duplicate (RPD)	Х				Х		
ICP Serial Dilution %D	Х				Х		
Total vs. Dissolved	Х				Х		
Reporting Limit Verification		x		Х			
Tier III Validation							
Initial Calibration Verification		x		Х			
Continuing Calibration Verification		x		Х			
CRDL Standard Recovery		x		Х			
ICP Interference Check		x		Х			
ICP-MS Internal Standards	Х				Х		
Transcription/calculations acceptable		Х		Х			
Raw Data	Х				Х		
Reporting limits adjusted to reflect sample dilutions		Х		Х			
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%
	Hexavalent Chromium, Insoluble	< 50%	< 50%
BS-C1711	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 <sup>1</sup>
	Non-detect	UJ-
Spike recovery ≥ 50% but < 75%	Detect	J-
0.1	Non-detect	R/RA
Spike recovery < 50%	Detect	R/RA
Spike recovery > 125%	Non-detect	No Action
Spike recovery > 125% but ≤ 150%	Detect	J+
Spike recovery > 150%	Detect	R

Notes:

<sup>1</sup> 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.

<u>SDG #JC83593</u>: 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%.

<u>SDGs #JC83511, JC83593, and JC83681</u>: The PDS analysis performed on sample location SW-A23(0.0-0.5), BS-C17TT, and BS-B2 exhibited recoveries within the control limits.

<u>SDGs #JC83512 and JC83762</u>: 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%	

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Notes:
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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		
	Non-detect	UJ-		
PDS recovery < 85%	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  $\pm$  the RL is used.

<u>SDGs #JC83512, JC83593, and JC83681</u>: The laboratory duplicate analysis performed on sample locations BS-C17S, BS-C17TT, and BS-B2 exhibited results within the control limit.

<u>SDGs #JC83511 and JC83762</u>: 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		Non-detect	UJ
sample result < four times the RL	± KL	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.

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

## DATA VALIDATION CHECKLIST FOR HEXAVALENT CHROMIUM

%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		Analysis: 3 days				
BS-E17						
CS-F18	SW846 9045D		< 24 hours of receipt by laboratory			
BS-B2						
BS-D18		Analysis: 6 days				
BS-D17T						
SW-A23(0.0-0.5)		Analysis: 24 days				
BS-E18		Analysis: 25 days				
BS-B2	ASTM D3872-86	Analysis: 28 days	< 24 hours from collection			
BS-C17TT		Analysis: 29 days				
BS-C17S		Analysis: 30 days				
SW-A23(0.0-0.5)		Analysis: 24 days				
BS-E18	SM4500S2-A	Analysis: 25 days	< 7 days from collection			
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	
BS-E18		Analysis: 25 days	< 14 days from collection
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.

	Qualifi	cation
Criteria	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.

<u>SDGs #JC83511, JC83512, and JC83593</u>: 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.

<u>SDGs #JC83681 and JC83762</u>: 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.

<u>SDGs #JC83511</u>: 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	Rep	orted	Perfor Acce	mance otable	Not Required
9045D, ASTM D1498-76	No	Yes	No	Yes	Required
Miscellaneous Instrumentation					
Tier II Validation					
Holding times		X	х		
Reporting limits (units)		x		Х	
Blanks					
A. Instrument Blanks		х		Х	
B. Method blanks		X		x	
C. Equipment blanks		Х		X	
Laboratory Control Sample (LCS) %R		Х		Х	
Laboratory Control Sample Duplicate (LCSD) %R	Х				Х
LCS/LCSD Precision (RPD)	Х				Х
Matrix Spike (MS) %R	Х				Х
Matrix Spike Duplicate (MSD) %R	Х				Х
MS/MSD Precision (RPD)	Х				Х
Field/Lab Duplicate (RPD)		Х		Х	
Dilution Factor		Х		X	
Tier III Validation					·
Initial calibration %RSD or correlation coefficient	Х				Х
Continuing calibration %R	Х				Х
Raw Data		X		Х	
Transcription/calculation errors present		Х		х	
Reporting limits adjusted to reflect sample dilutions		х		Х	
Notes:	1		1	1	1

%R Percent recovery

RPD Relative percent difference

VALIDATION PERFORMED BY: Jennifer Singer

SIGNATURE:

Anniper Alinger

DATE: June 20, 2019

PEER REVIEW: Dennis Capria

DATE: July 12, 2019

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# CHAIN OF CUSTODY CORRECTED SAMPLE ANALYSIS DATA SHEETS



	Ø		CHAI	N OF	CU	STO	סכ	Y										PAC	GE _	L	ΣF <sup>(</sup>
363	6		2235 F	Route 130,	Dayton,	- Daytor NJ 088	n 10				FEC	-EX Track	ng #		_		Botfe O	rder Contro	1#		
1			TEL. 732	-329-0200 www.sgs.	FAX com/ehs	/32-329- Jsa	3499				SG	Guote #					SGS Job	>#		JC8	3511
Client / Reporting Information	Project Name		Project	Informatic	n j	1.00						Re	queste	d Ana	lysis (	500 T	EST C	ODE sh	eet)		Matrix Codes
Corpagn Name Corpagn Name Street Address 10 FFTEMS Lone, Site 20 City State Newton, PA Project Contact 20440 E-mail	PPG Street 18 Chy City Jersey Project #	Site 1 uper A y City,	venue State NJ	Billing Info Company N Street Addre	ermation (i ame	<u>Cù t</u> f differen	t from	Report	to)												DW - Drinking Wate GW - Ground Water WW - Water SW - Surface Water SO - Soil SL - Sludge SED-Sediment OI - Oil LIQ - Other Liquid
Mathew Bell Brows B 610-755-7080 Sampler(s) Name(s) C Cifell; Phone #	Client Purchase	Onder# 1Llauchl	0003	City Attention:			St	ate	_	Zip		Char un	lant cha			5	dium				AIR - Air SOL - Other Solid WP - Wipe FB-Field Blank EB-Equipment Blani RB- Rinse Blank TB-Trip Blank
Lab Sample # Field ID / Point of Collection	MEOH/DI Vial #	Date	Time	Sampled by	Matrix	# of bottles	HCI NaOH	SONH	of preserv	WEOH ENCORE	ŀ	10tal	1/1/1	Anh	1	N. k	Vana				LAB USE ONLY
FB(20190227) - A		2/27/19	\$240	10	FB	2	$\left  \right $	14		++	$\mathbb{H}$		<u>+</u> ,×	X.	X	X	X				All
- SW-A22 (0.0-0.5)		2/27/11	1245	<u> </u>	20	- (		++	-14-	+	++	$\left( + \right)$	₩ <mark>X</mark>	1 ×	X		X	-+	+		- 518
3  SW - A22(1.0 - 2.5)		2/22/19	1055	CC CC	50		$\vdash$	+		++	$\square$	Ϋ́́́́́	t	1¢		X	X				DI
5 54 0 22 (1.0-2.5)		2/22/15	1115	CC CC	SI		H	H	11	++	++ -	x x	fχ	X	Ŷ	r Y	¥	-+	+	-	- 010
6 197 M924N-1		7/27/15	1325	(	50	1			1				X	X	X	X	X			-	
7 107 MO34N		2/27/19	1335	cC	50	1		H	l		<b>)</b>	X	X	X	X	X	X		-		
												_	-		-						
Turnaround Time ( Business days)   Std. 10 Business Days   5 Day RUSH   3 Day RUSH   2 Day RUSH   1 Day RUSH	Approved by (S	3S Project Manage	or)/Date: - - - -		ommercia ommercia ULLT1 (L J Reduced ommercia <i>NJ Data</i>	Data "A" (Lev "B" ( Lev evel 3+4 ) "C" of Known	Delive rel 1) rel 2) Qualit	y Prote	nformat	ON NYASP Ca NYASP Ca State Forr EDD Forr Other Orting	ategory A ategory B ms mat	A 3				I Comr	HTIAL	ASES	SSME TCAT	NT 2	<u>A@</u>
other Emergency & Rush T/A data available via LabLink	S	ample Custody r	- must be docu	Commercial NJ Reduce mented be	"A" = Results d = Results low each	Its Only; + QC Sur time sam	Comm nmary +	Partia hang	"B" = Re Raw dat	a ssion, in	Summa	y courier	Sam	ple inv	ventor	y is ve	erified	upon re	eceipt	in the L	aboratory
Reinquictaned by Sampler:	19/1357	1 Ser	~ 2	27/19	13.	18	2	JĊ	h	. Y	27/	9		28	<u>~22</u>	>	Receiver 2	l By:	4	$\sim$	
Relinquished by Sampler: Date Time: '	1	Received By: Received By:					4 Custod	Seal #	14	,	Inta	a	Preser	ved when	me: re applica	able	Kecelve 4	a By:	On Ice	/ Cor	oler Temp.
3		]9						<u> </u>			<u>Not</u>	intact					_			•	

JC83511: Chain of Custody Page 1 of 4



5.2

S

Chromium, Hexavalent

Redox Potential Vs H2

pH <sup>a</sup>

Client Sample ID: Lab Sample ID:	FB(20190227)-A JC83511-1	.1			Date Sampl	ed: 02	2/27/19	
Matrix: Project:	AQ - Field Blank So PPG Site 107, 18 Ch	apel Avenue	e, Jersey Ci	ty, NJ	Percent Soli	/ed: 02 ids: n/	a	
General Chemistry	7							
Analyte	Result	RL	Units	DF	Analyzed	By	Method	

mg/l

mv

su

1

1

1

02/27/19 22:28 јо

02/28/19 09:25 RI

02/27/19 19:05 JK

0.010

## **Report of Analysis**

## Page 1 of 1

SW846 7196A

ASTM D1498-76

SM4500H+ B-11

4.1 **4** 

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

< 0.010

461

4.48



8 of 59



#### SGS LabLink@1042801 15:31 14-Jun-2019

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		
			,

# **Report of Analysis**

#### **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

## Page 1 of 1

4.2

#### SGS LabLink@1042801 15:31 14-Jun-2019

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		

# **Report of Analysis**

**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

Page 1 of 1

4.3

4



JC83511

#### SGS LabLink@1042801 15:31 14-Jun-2019

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		

# **Report of Analysis**

#### **General Chemistry**

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent Redox Potential Vs H2	17.4 J 449	0.48	mg/kg mv	1 1	03/05/19 12:29 02/28/19 16:36	RI RI	SW846 3060A/7196A 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

## Page 1 of 1

4.4



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

## Page 1 of 1

4.5



Client Sample ID: Lab Sample ID: Matrix:	107_M024N_1 JC83511-6 SO - Soil	Date Sampled: Date Received: Percent Solids:	02/27/19 02/27/19 77.5			
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ					
General Chemistry						

#### гу

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

## Page 1 of 1

4.6


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		
Conoral Chamistry			

#### General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	< 0.46 <b>UJ</b>	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

#### Page 1 of 1

4.7



		Repo	rt of An	alysis	Page 1 of 1
Client Sample ID: S	W-A22(0.0-0.5)				
Lab Sample ID:	583511-2R				<b>Date Sampled:</b> 02/27/19
Matrix: S	O - Soil				<b>Date Received:</b> 02/27/19
					Percent Solids: 70.9
Project: P	PG Site 107, 18 Cha	apel Avenue	, Jersey Cit	y, NJ	
General Chemistry					
Analyte	Result	RL	Units	DF	Analyzed By Method
Chromium, Hexavalen	t 20.3	0.56	mg/kg	1	03/18/19 13:51 RI SW846 3060A/7196A



44

		Repo	ort of An	alysis	I	Page 1 of 1
Client Sample ID: S	SW-A22(2.0-2.5)					
Lab Sample ID: 🔿	C83511-3R				<b>Date Sampled:</b> 02/27/19	
Matrix: S	SO - Soil				<b>Date Received:</b> 02/27/19	
		_			Percent Solids: 67.5	
Project: I	PPG Site 107, 18 Cha	pel Avenue	e, Jersey Cit	y, NJ		
General Chemistry						
Analyte	Result	RL	Units	DF	Analyzed By Method	
Chromium, Hexavaler	nt 63.8	1.2	mg/kg	2	03/18/19 13:51 RI SW846.30	60A/7196A



4.2

		Repo	rt of An	alysis		Page 1 of 1
Client Sample ID:	SW-A23(0.0-0.5)					
Lab Sample ID:	JC83511-4R				<b>Date Sampled:</b> 02/27/19	
Matrix:	SO - Soil				<b>Date Received:</b> 02/27/19	
					Percent Solids: 82.7	4
Project:	PPG Site 107, 18 Cha	apel Avenue	Jersey Cit	y, NJ		
General Chemistry	y				<u> </u>	
Analyte	Result	RL	Units	DF	Analyzed By Meth	od
Chromium, Hexava	alent 11.2	0.48	mg/kg	1	03/18/19 13:47 RI SW846	3060A/7196A

#### RL = Reporting Limit



Client Sample ID: Lab Sample ID: Matrix: Project:	SW-A23(0.0-0.5) JC83511-4RT SO - Soil PPG Site 107, 18 Chap	pel Avenue	e, Jersey Cit	ty, NJ	Date Sampl Date Receiv Percent Soli	ed: 02 red: 02 ids: 82	/27/19 /27/19 7	
General Chemistry	,							1
Analyte	Result	RL	Units	DF	Analyzed	By	Method	

Iron, Ferrous <sup>a</sup> 0.99 J 0.20 % 1 03/23/19 09:30 MP ASTM D3872-86 Sulfide Screen<sup>h</sup> NEGATIVE -SM4500S2- A-11 R 03/23/19 11:00 MP Total Organic Carbon c 120 mg/kg 1 169000 J 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.



		Repo	rt of An	alysis	Page	1 of 1
Client Sample ID: S	W-A23(2.0-2.5)					
Lab Sample ID: J	C83511-5R				<b>Date Sampled:</b> 02/27/19	
Matrix: S	O - Soil				<b>Date Received:</b> 02/27/19	
					Percent Solids: 77.0	
Project: F	PG Site 107, 18 Cha	apel Avenue	Jersey Cit	y, NJ		
General Chemistry						
Analyte	Result	RL	Units	DF	Analyzed By Method	
Chromium, Hexavaler	it 19.3	0.52	mg/kg	1	03/18/19 13:51 RI SW846 3060A	7196A



4.5

		Page 1 of 1			
Client Sample ID	107_M024N_1				
Lab Sample ID:	JC83511-6R				<b>Date Sampled:</b> 02/27/19
Matrix:	SO - Soil				<b>Date Received:</b> 02/27/19
					Percent Solids: 77.5
Project:	PPG Site 107, 18 0	Chapel Avenue	, Jersey Cit	y, NJ	
General Chemistr	·y				
Analyte	Result	RL	Units	DF	Analyzed By Method
Chromium, Hexav	alent 20.3	0.52	mg/kg	1	03/18/19 13:51 RI SW846 3060 <del>A</del> /7196A



4.6

		Repo	rt of An	alysis	Page 1 of 1
Client Sample ID:	107_M034N				
Lab Sample ID:	JC83511-/R				Date Sampled: 02/27/19
Matrix:	50 - 5011				Date Received: 02/21/19 Demonst Solids: 86.5
Project:	PPG Site 107, 18 Cha	pel Avenue	. Jersey Cit	y, NJ	reicent solus. 80.5
General Chemistry					
Analyte	Result	RL	Units	DF	Analyzed By Method
Chromium, Hexaval	ent < 0.46	0.46	mg/kg	1	03/18/19 13:51 RI SW846 3960A/7196A



#### SGS LabLink@1042801 15:31 14-Jun-2019

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
		<b>Percent Solids:</b>	n/a
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

# **Report of Analysis**

#### **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 <sup>1</sup>	SW846 3010A <sup>2</sup>
Chromium	< 10	10	ug/l	1	02/28/19	02/28/19 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>
Nickel	< 10	10	ug/l	1	02/28/19	02/28/19 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>
Thallium	< 10	10	ug/l	1	02/28/19	02/28/19 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>
Vanadium	< 50	50	ug/l	1	02/28/19	02/28/19 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA46229

(2) Prep QC Batch: MP12775



4



Client Sample ID: Lab Sample ID: Matrix: Project:	FB(20190 JC83511- AQ - Fiel PPG Site	227)-A 1A d Blank Soil 107, 18 Chape	l Avenue,	Jersey City	, NJ	Date Sampled Date Received Percent Solids	: 02/ : 02/ : n/a	/27/19 /27/19 h
General Chemistry								
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivaler	nt <sup>a</sup>	< 0.020	0.020	mg/l	1	02/28/19 17:47	ND	SW846 6010/7196A M

Page 1 of 1

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





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 <sup>1</sup>	SW846 3050B <sup>3</sup>
Nickel	923 193	1.4 5.5	mg/kg mg/kg	1	02/27/19	02/28/19 ND 02/28/19 ND	SW846 6010D <sup>1</sup> SW846 6010D <sup>1</sup>	SW846 3050B <sup>-5</sup> SW846 3050B <sup>-3</sup>
Thallium <sup>a</sup> Vanadium	< 4.1 295	4.1 6.8	mg/kg mg/kg	3 1	02/27/19 02/27/19	02/28/19 ND 02/28/19 ND	SW846 6010D <sup>2</sup> SW846 6010D <sup>1</sup>	SW846 3050B <sup>3</sup> SW846 3050B <sup>3</sup>

(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.





Client Sample ID: Lab Sample ID: Matrix: Project:	SW-A22( JC83511- SO - Soil PPG Site	0.0-0.5) ·2A 107, 18 Cha	apel Avenue,	Jersey Cit	y, NJ	Date Sampled Date Received Percent Solids	: 02 : 02 : 70	/27/19 /27/19 .9
General Chemistry								
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivaler	nt <sup>a</sup>	906	2.0	mg/kg	1	03/05/19 12:34	RI	SW846 6010/7196A M

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



4.2



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		

**Metals Analysis** 

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Antimony <sup>a</sup>	< 15	15	mg/kg	5	02/27/19	02/28/19 ND	SW846 6010D <sup>2</sup>	SW846 3050B <sup>3</sup>
Chromium	2420	7.3	mg/kg	5	02/27/19	02/28/19 ND	SW846 6010D <sup>2</sup>	SW846 3050B <sup>3</sup>
Nickel	384	5.9	mg/kg	1	02/27/19	02/28/19 ND	SW846 6010D 1	SW846 3050B <sup>3</sup>
Thallium <sup>a</sup>	< 7.3	7.3	mg/kg	5	02/27/19	02/28/19 ND	SW846 6010D <sup>2</sup>	SW846 3050B <sup>3</sup>
Vanadium <sup>a</sup>	554	37	mg/kg	5	02/27/19	02/28/19 ND	SW846 6010D <sup>2</sup>	SW846 3050B <sup>3</sup>

(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.







Client Sample ID: Lab Sample ID: Matrix: Project:	SW-A22( JC83511- SO - Soil PPG Site	2.0-2.5) 3A 107, 18 Chap	Date Sampled: Date Received Percent Solids	02/ : 02/ : 67.	/27/19 /27/19 5			
General Chemistry								
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivaler	nt <sup>a</sup>	2370	7.9	mg/kg	1	03/05/19 12:34	RI	SW846 6010/7196A M

Page 1 of 1

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





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
		<b>Percent Solids:</b>	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 <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	214	1.2	mg/kg	1	02/27/19	02/28/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	34.7	4.6	mg/kg	1	02/27/19	02/28/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>
Thallium	< 1.2	1.2	mg/kg	1	02/27/19	02/28/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>
Vanadium	44.9	5.8	mg/kg	1	02/27/19	02/28/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA46226

(2) Prep QC Batch: MP12752



4.4 **4** 



Client Sample ID: Lab Sample ID: Matrix: Project:	SW-A23(0.0-0.5) JC83511-4A SO - Soil PPG Site 107, 18 Chapel Avenue, Jersey City, NJ					Date Sampled: Date Received Percent Solids	: 02/ : 02/ : 82.	/27/19 /27/19 7
General Chemistry								
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivaler	nt <sup>a</sup>	197	1.7	mg/kg	1	03/05/19 12:29	RI	SW846 6010/7196A M

Page 1 of 1

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





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 <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	687	1.4	mg/kg	1	02/27/19	02/28/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	74.0	5.5	mg/kg	1	02/27/19	02/28/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>
Thallium	< 1.4	1.4	mg/kg	1	02/27/19	02/28/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>
Vanadium	117	6.8	mg/kg	1	02/27/19	02/28/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA46226

(2) Prep QC Batch: MP12752



4.5 **4** 



Client Sample ID: Lab Sample ID: Matrix: Project:	SW-A23( JC83511- SO - Soil PPG Site	(2.0-2.5) -5A 107, 18 Cha	apel Avenue,	Date Sampled: Date Received Percent Solids	: 02 : 02 : 77	/27/19 /27/19 .0		
General Chemistry								
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivaler	nt <sup>a</sup>	641	1.9	mg/kg	1	03/05/19 12:34	RI	SW846 6010/7196A M

Page 1 of 1

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





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		

**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 <sup>3</sup>
Chromium	564	1.2	mg/kg	1	02/27/19	02/28/19 ND	SW846 6010D 1	SW846 3050B <sup>3</sup>
Nickel	56.9	5.0	mg/kg	1	02/27/19	02/28/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>3</sup>
Thallium <sup>a</sup>	< 2.5	2.5	mg/kg	2	02/27/19	02/28/19 ND	SW846 6010D <sup>2</sup>	SW846 3050B <sup>3</sup>
Vanadium	94.3	6.2	mg/kg	1	02/27/19	02/28/19 ND	SW846 6010D 1	SW846 3050B <sup>3</sup>

(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.







			Repo	ort of An	alysis			Page 1 of 1
Client Sample ID:	107_M02	4N_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 Ch	apel Avenu	e, Jersey Cit	y, NJ			
General Chemistry								
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivaler	nt <sup>a</sup>	516	2.2	mg/kg	1	03/05/19 12:34	RI	SW846 6010/7196A M

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







Client Sample ID:	107_M034N		
Lab Sample ID:	JC83511-7A	Date Sampled:	02/27/19
Matrix:	SO - Soil	Date Received:	02/27/19
		<b>Percent Solids:</b>	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	< 2.4	2.4	mg/kg	1	02/27/19	02/28/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	15.2	1.2	mg/kg	1	02/27/19	02/28/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	13.5	4.7	mg/kg	1	02/27/19	02/28/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>
Thallium	< 1.2	1.2	mg/kg	1	02/27/19	02/28/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>
Vanadium	22.3	5.9	mg/kg	1	02/27/19	02/28/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA46226

(2) Prep QC Batch: MP12752



4.7 4





			Repo	rt of An	alysis			Page 1 of 1
Client Sample ID:	107_M03	4N						
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 Cha	apel Avenue,	, Jersey Cit	y, NJ			
General Chemistry	,							
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivaler	nt <sup>a</sup>	15.2	1.7	mg/kg	1	03/05/19 12:34	RI	SW846 6010/7196A M

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



4.7

				TEL. 7	32-329-0	200	FAX: 7	2-329-	499/3	480				SGS Q	iote #					SGS Job	8		8.8	2512
Client / Reporting Informa	tion			Projec	ww. tinform:	w.sgs. ation	com/eh	susa						+				Reque	sted Ar	alysis		_`	10	Matrix Codes
peny Name:	Pro	ject Name:													1									
rcadis	PP	G Site 107	7 (Jersey Cl	ity)		_								-										DW - Drinking Water GW - Ground Water
D Friends Lane, Suite 200	18	Chapel A	venue		8 Ning Int	ormatio	(If differe	nt from B	eport to	»)				1										SW - Surface Water SO - Soil
State	Zip City 18440 Jer	rsev City		State N.I	Company	Name								7										SL- Sludge SED-Sediment
et Contact E-mail	Pro	poct #			Street Add	ress																		OI - Oil LIQ - Other Liquid
atthew Bell	NP	000770.00	003 Order #		City				s	tate		Z	p	-										SOL - Other Sold WP - Wipe
10.755.7080								-							5							1		FB - Field Biank EB-Equipment Blank
ver(s) Name(s) C Buchanan	Phone # Pro	n Miclaugh	nin, Jr.		Attention									5	Chrom	num								RB - Rinse Blank TB - Trip Blank
T				Collection		_				Number	of poesars	ad Both	••	- M	alent (	DI CIN	È		E	5				
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FB(20190227)			2/27/19	1240	CB	G	FB	2		1	1	H	Ħ	170	Y	4	4	4	4	+				
107-K32			2/27/19	1330	CB	G	50	1			1		T	14	Y	Y	7	Y	4	7				AU
BS-C175			2/27/19	1340	CB	G	50	1			1			Ý	¥	4	4	+	4	4				618
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5 Business Days		-				NJR	duced (Le	rvel 3)			-	CP Cr	teria						INIT		ASES	SM		3A(P)
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SGS Post Ex Sample COCs Template 20190109

JC83512: Chain of Custody Page 1 of 4



É

5.2

S

Client Sample ID: Lab Sample ID:	FB(20190227) JC83512-1				Date Sampl	ed: 02/27/19	
Matrix: Project:	AQ - Field Blank Soi PPG Site 107, 18 Ch	l apel Avenue	e, Jersey Ci	ty, NJ	Date Receiv Percent Sol	<b>ids:</b> n/a	
General Chemistry	7						
Analyte	Result	RL	Units	DF	Analyzed	By Method	

mg/l

mv

su

1

1

1

02/27/19 22:32 јо

02/28/19 09:28 RI

02/27/19 19:10 JK

0.010

## **Report of Analysis**

#### Page 1 of 1

SW846 7196A

ASTM D1498-76

SM4500H+ B-11

4.1 **4** 

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

Chromium, Hexavalent

Redox Potential Vs H2

pH <sup>a</sup>

< 0.010

473

4.46



Client Sample ID:	107_K032		
Lab Sample ID:	JC83512-2	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 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

#### Page 1 of 1

4.2



Result

76.5 J-

319

73.8

7.45

RL

2.7

Analyte

pН

Chromium, Hexavalent

Redox Potential Vs H2

Solids, Percent

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	7		

Units

mg/kg

mv

%

su

DF

5

1

1

1

Analyzed

03/06/19 17:58 NV

02/28/19 17:16 RI

03/01/19 09:23 RC

02/28/19 16:17 RI

## **Report of Analysis**

#### RL = Reporting Limit



4.3

Page 1 of 1

Method

SW846 3060A/7196A

SM2540 G 18TH ED MOD

ASTM D1498-76M

SW846 9045D

By



		Repo	rt of An	alysis		Page 1 of 1
Client Sample ID:	107_K032					
Lab Sample ID:	JC83512-2R				<b>Date Sampled:</b> 02/27/19	)
Matrix:	SO - Soil				<b>Date Received:</b> 02/27/19	)
					Percent Solids: 68.1	
Project:	PPG Site 107, 18 Ch	apel Avenue	, Jersey Cit	y, NJ		
General Chemistr	y					
Analyte	Result	RL	Units	DF	Analyzed By Met	hod
Chromium, Hexava	alent < 0.59	0.59	mg/kg	1	03/19/19 16:32 RI SW82	16 3060A/7196A





4.1 4

SGS LabLink@1042801 15:32 14-Jun-2019

			Report of Analysis							
Client Sample ID:	BS-C17S									
Lab Sample ID:	JC83512	-3R				<b>Date Sampled:</b> 02/27/19				
Matrix:	SO - Soi					<b>Date Received:</b> 02/27/19				
						Percent Solids: 73.8				
Project:	PPG Site	e 107, 18 Cha	pel Avenue	Jersey Cit	y, NJ					
General Chemistr	У									
Analyte		Result	RL	Units	DF	Analyzed By Meth	ıod			
Chromium, Hexav	alent	45.9	1.1	mg/kg	2	03/19/19 16:32 RI SW84	6 3060A/7196A			





4.2 4

Client Sample ID: Lab Sample ID: Matrix: Project:	BS-C17S JC83512-3RT SO - Soil PPG Site 107, 18 Cha	pel Avenue	e, Jersey Cit	Date Sampled:02/27/19Date Received:02/27/19Percent Solids:73.8				
General Chemistry	,							
Analyte	Result	RL	Units	DF	Analyzed	By	Method	

1

1

03/29/19 11:30 MP

03/29/19 11:30 MP

03/22/19 17:17 CD

### **Report of Analysis**

Page 1 of 1

ASTM D3872-86

SM4500S2- A-11 R

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.

%

mg/kg

0.20

140

0.22 J

89500 J

NEGATIVE

(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.

Iron, Ferrous <sup>a</sup>

Sulfide Screen b

Total Organic Carbon c





#### SGS LabLink@1042801 15:32 14-Jun-2019

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
		<b>Percent Solids:</b>	n/a
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

# **Report of Analysis**

#### **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 <sup>1</sup>	SW846 3010A <sup>2</sup>
Chromium	< 10	10	ug/l	1	02/28/19	02/28/19 ND	SW846 6010D 1	SW846 3010A <sup>2</sup>
Nickel	< 10	10	ug/l	1	02/28/19	02/28/19 ND	SW846 6010D 1	SW846 3010A <sup>2</sup>
Thallium	< 10	10	ug/l	1	02/28/19	02/28/19 ND	SW846 6010D 1	SW846 3010A <sup>2</sup>
Vanadium	< 50	50	ug/l	1	02/28/19	02/28/19 ND	SW846 6010D 1	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA46229

(2) Prep QC Batch: MP12775



4



Client Sample ID: Lab Sample ID: Matrix: Project:	FB(20190 JC83512- AQ - Fiel PPG Site	FB(20190227)Date Sampled:02/27/19JC83512-1ADate Received:02/27/19AQ - Field Blank SoilDate Received:02/27/19PPG Site 107, 18 Chapel Avenue, Jersey City, NJn/a								
General Chemistry	7									
Analyte		Result	RL	Units	DF	Analyzed	By	Method		
Chromium, Trivaler	nt <sup>a</sup>	< 0.020	0.020	mg/l	1	02/28/19 17:53	ND	SW846 6010/7196A M		

Page 1 of 1

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





Client Sample ID:	107-K32		
Lab Sample ID:	JC83512-2A	Date Sampled:	02/27/19
Matrix:	SO - Soil	Date Received:	02/27/19
		<b>Percent Solids:</b>	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 <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	15.9	1.5	mg/kg	1	02/27/19	02/28/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	11.5	6.1	mg/kg	1	02/27/19	02/28/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>
Thallium	< 1.5	1.5	mg/kg	1	02/27/19	02/28/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>
Vanadium	24.1	7.6	mg/kg	1	02/27/19	02/28/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA46226

(2) Prep QC Batch: MP12752



4.2 4



Client Sample ID: Lab Sample ID: Matrix: Project:	107-K32 JC83512- SO - Soil PPG Site	-2A 107, 18 Cha	apel Avenue	, Jersey Cit	y, NJ	Date Sampled Date Received Percent Solids	: 02 : 02 : 68	/27/19 /27/19 .1
General Chemistry								
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivaler	nt <sup>a</sup>	15.9	2.1	mg/kg	1	03/06/19 17:58	NV	SW846 6010/7196A M

Page 1 of 1

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





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		
<u> </u>			

**Metals Analysis** 

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Antimony <sup>a</sup>	< 5.2	5.2	mg/kg	2	02/27/19	02/28/19 ND	SW846 6010D <sup>2</sup>	SW846 3050B <sup>3</sup>
Chromium	1320	2.6	mg/kg	2	02/27/19	02/28/19 ND	SW846 6010D <sup>2</sup>	SW846 3050B <sup>3</sup>
Nickel	20.0	5.2	mg/kg	1	02/27/19	02/28/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>3</sup>
Thallium	< 1.3	1.3	mg/kg	1	02/27/19	02/28/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>3</sup>
Vanadium <sup>a</sup>	24.1	13	mg/kg	2	02/27/19	02/28/19 ND	SW846 6010D <sup>2</sup>	SW846 3050B <sup>3</sup>

(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.







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	7													
Analyte		Result	RL	Units	DF	Analyzed	By	Method						
Chromium, Trivaler	nt <sup>a</sup>	1240	5.3	mg/kg	1	03/06/19 17:58	NV	SW846 6010/7196A M						

Page 1 of 1

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



	SIL		SGS North America Inc Dayton											FED-EX	Tracking I					Botte Order Control						
	VUV				TEL. 7	235 ROU 32-329-0	1200	FAX: 7	32-329-	3499/	3480					SGS Qu	900 Ø					SGS Jok	_ A1	<u>K-0</u>		7002
						w	w.sgs.	.com/el	ISUSA							+									ιy	5342
Client / Reporting Information			Project Information											+				Reque	quested Analysis					Matrix Cod		
Longany Name:			PDC Site 10	Project Name															ł					DW - Drinking I		
Alca			Circuit	(Jersey Ch												-										GW - Ground V
Street Address 10 Friends Lane, Suite 200 City State Zip Newtown, PA 18440			18 Chapel Avenue													1										SW - Surface
			City State			Billing Information (if different from Report to) Company Name										-										SO - Sof SL- Skudg
			Jersey City NJ																						SED-Sedim OI - OI	
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SGS Post Ex Sample COCs Template 20190109

JC83593: Chain of Custody Page 1 of 4



5.2

G


Chromium, Hexavalent

Redox Potential Vs H2

pH <sup>a</sup>

General Chemistry	7						
Project:	PPG Site 107, 18 Cha	apel Avenue	e, Jersey Ci	ty, NJ	Percent Soli	ids: n/a	
Client Sample ID: Lab Sample ID: Matrix:	FB(20190228) JC83593-1 AQ - Field Blank Soi	I			Date Sampl Date Receiv	ed: 02/28 red: 02/28	//19 //19

mg/l

mv

su

1

1

1

0.010

### **Report of Analysis**

Page 1 of 1

SW846 7196A

SM4500H+ B-11

02/28/19 22:11 јо

02/28/19 19:03 AS

03/03/19 11:20 JOO ASTM D1498-76

4.1 **4** 

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

< 0.010

430

4.47





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		
Conoral Chamister			

#### **General Chemistry**

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	< 0.61 <b>RA</b>	0.61	mg/kg	1	03/06/19 17:40	100	SW846 3060A/7196A 🔭
Redox Potential Vs H2	214		mv	1	03/03/19 11:13	100	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

#### Page 1 of 1

4.2



Client Sample ID: Lab Sample ID: Matrix: Project:	BS-C17T JC83593- SO - Soil PPG Site	T 2R 107, 18 Cha	pel Avenue,	Jersey Cit	y, NJ	Date Sampled Date Received Percent Solids	: 02 : 02 : 65	/28/19 /28/19 .4
General Chemistry								
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexava	lent	1.4 <b>RA</b>	0.61	mg/kg	1	03/19/19 15:18	RI	SW846 3060A/7196A

Page 1 of 1



4.1

Client Sample ID: Lab Sample ID: Matrix: Project:	BS-C17TT JC83593-2RT SO - Soil PPG Site 107, 18 Cha	Date Sampl Date Receiv Percent Soli	ed: 02 ved: 02 ids: 65	2/28/19 2/28/19 5.4				
General Chemistry	r.							
Analyte	Result	RL	Units	DF	Analyzed	By	Method	

1

1

1

03/29/19 11:30 мр

03/29/19 11:30 MP

03/22/19 11:36 CD

#### **Report of Analysis**

Page 1 of 1

ASTM D3872-86

SM4500S2- A-11 R

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.

%

mg/kg

0.20

150

1.2 J

NEGATIVE

36200 J

(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.

Iron, Ferrous <sup>a</sup>

Sulfide Screen h

Total Organic Carbon c



#### SGS LabLink@1042801 15:33 14-Jun-2019

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		

# **Report of Analysis**

#### **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 <sup>1</sup>	SW846 3010A <sup>2</sup>
Chromium	< 10	10	ug/l	1	03/01/19	03/01/19 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>
Nickel	< 10	10	ug/l	1	03/01/19	03/01/19 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>
Thallium	< 10	10	ug/l	1	03/01/19	03/01/19 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>
Vanadium	< 50	50	ug/l	1	03/01/19	03/01/19 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA46234

(2) Prep QC Batch: MP12803



4

4



7 of 399

Client Sample ID: Lab Sample ID: Matrix: Project:	FB(20190 JC83593- AQ - Fiel PPG Site	)228) 1A d Blank Soil 107, 18 Chapel	Avenue,	Jersey City	, NJ	Date Sampled Date Received Percent Solids	: 02/ : 02/ : n/a	/28/19 /28/19 h
General Chemistry								
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivaler	nt <sup>a</sup>	< 0.020	0.020	mg/l	1	03/01/19 16:34	ND	SW846 6010/7196A M

Page 1 of 1

44

4

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



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 <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	34.5	1.5	mg/kg	1	02/28/19	03/01/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	20.4	5.9	mg/kg	1	02/28/19	03/01/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Thallium	< 1.5	1.5	mg/kg	1	02/28/19	03/01/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Vanadium	35.6	7.4	mg/kg	1	02/28/19	03/01/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA46234

(2) Prep QC Batch: MP12752



4.2 4





Client Sample ID: Lab Sample ID: Matrix: Project:	BS-C17T JC83593- SO - Soil PPG Site	BS-C17TT JC83593-2A SO - Soil PPG Site 107, 18 Chapel Avenue, Jersey City, NJ Date Sampled: 02/28/19 Date Received: 02/28/19 Percent Solids: 65.4										
General Chemistry	,											
Analyte		Result	RL	Units	DF	Analyzed	By	Method				
Chromium, Trivaler	nt <sup>a</sup>	34.5	2.1	mg/kg	1	03/06/19 17:40	JOO	SW846 6010/7196A M				

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

Page 1 of 1







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3	BS-D18			3/1/19	1320	СВ	G	80	1		í.		T				X	х	х	х	X	X	X					613
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SGS Post Ex Sample COCs Template 2019010

JC83681: Chain of Custody Page 1 of 8





Chromium, Hexavalent

Redox Potential Vs H2

pH <sup>a</sup>

< 0.010

505

5.91

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

Analyte	Result	RL	Units	DF	Analyzed	By Method	
General Chemistry	Ŷ						
Project:	PPG Site 107, 18 Cha	apel Avenue	e, Jersey Ci	ty, NJ			
Matrix:	AQ - Field Blank Soi	l			Date Receiv Percent Soli	red: 03/01/19 ids: n/a	
Client Sample ID: Lab Sample ID:	FB(20190301) JC83681-1				Date Sample	<b>ed:</b> 03/01/19	

mg/l

mv

su

1

1

1

03/01/19 21:18 јо

03/06/19 17:15 ев

03/01/19 19:00 AS

0.010

### **Report of Analysis**

Page 1 of 1

SW846 7196A

ASTM D1498-76

SM4500H+ B-11

4.1 **4** 

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
Solids, Percent	88.3		//////////////////////////////////////	1	03/04/19 09:36	EB RC	ASTM D1498-76M SM2540 G 18TH ED MOD
рН	8.09 J		su	1	03/07/19 23:57	EB	SW846 9045D

#### Page 1 of 1

4.2

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		
C			

#### 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

#### Page 1 of 1

4.3



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		
Conoral Chamistry			

#### General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	23.0 <b>J</b> -	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 <b>J</b>		su	1	03/07/19 00:11	EB	SW846 9045D

#### Page 1 of 1

4.4



			Repo	rt of An	alysis		Page 1 of 1
Client Sample ID: Lab Sample ID: Matrix:	BS-B2 JC83681- SO - Soil	2R				<b>Date Sampled:</b> 03/01/1 <b>Date Received:</b> 03/01/1	19
Project:	PPG Site	107, 18 Cha	apel Avenue	, Jersey Cit	y, NJ	Percent Solids: 88.3	4
General Chemistr	у						
Analyte		Result	RL	Units	DF	Analyzed By Me	ethod
Chromium, Hexava	alent	10.2	0.45	mg/kg	1	03/22/19 11:50 RI SW	846 3060A/7196A



-

		Repo	rt of An	alysis	Page 1 of 1
Client Sample ID: Lab Sample ID: Matrix:	: BS-D18 JC83681-3R SO - Soil				<b>Date Sampled:</b> 03/01/19 <b>Date Received:</b> 03/01/19
Project: General Chemistr	PPG Site 107, 18 Ch	apel Avenue	. Jersey Cit	y, NJ	Percent Solids: 59.7
Analyte	Result	RL	Units	DF	Analyzed By Method
Chromium, Hexav	alent < 0.67	0.67	mg/kg	1	03/22/19 11:51 ri sw84 <del>6 3</del> 060A/7196A



~		Repo	rt of An	alysis		Page 1 of 1
Client Sample ID: B	S-D17T					
Lab Sample ID: JC	83681-4R				Date Sampled: 03/01/19	Ð
Matrix: SC	) - Soil				Date Received: 03/01/19	)
		_			Percent Solids: 71.9	
Project: PI	PG Site 107, 18 Ch	apel Avenue	, Jersey Cit	y, NJ		
General Chemistry					~	
Analyte	Result	RL	Units	DF	Analyzed By Met	hod
Chromium, Hexavalent	< 0.56	0.56	mg/kg	1	03/22/19 11:51 RI SW8	46 3060A/7196A



4.3

#### SGS LabLink@1042801 15:34 14-Jun-2019

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		

# **Report of Analysis**

#### **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 <sup>1</sup>	SW846 3010A <sup>2</sup>
Chromium	< 10	10	ug/l	1	03/02/19	03/04/19 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>
Nickel	< 10	10	ug/l	1	03/02/19	03/04/19 ND	SW846 6010D 1	SW846 3010A <sup>2</sup>
Thallium	< 10	10	ug/l	1	03/02/19	03/04/19 ND	SW846 6010D 1	SW846 3010A <sup>2</sup>
Vanadium	< 50	50	ug/l	1	03/02/19	03/04/19 ND	SW846 6010D 1	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA46240

(2) Prep QC Batch: MP12826



44



Client Sample ID: Lab Sample ID: Matrix: Project:	FB(20190301)       JC83681-1A       Date Sampled:       03/01/19         AQ - Field Blank Soil       Date Received:       03/01/19         PPG Site 107, 18 Chapel Avenue, Jersey City, NJ       n/a									
General Chemistry										
Analyte		Result	RL	Units	DF	Analyzed	By	Method		
Chromium, Trivaler	nt <sup>a</sup>	< 0.020	0.020	mg/l	1	03/04/19 14:12	ND	SW846 6010/7196A M		

Page 1 of 1

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





Client Sample ID:	BS-B2		
Lab Sample ID:	JC83681-2A	Date Sampled:	03/01/19
Matrix:	SO - Soil	Date Received:	03/01/19
		<b>Percent Solids:</b>	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 <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	112	1.1	mg/kg	1	03/02/19	03/04/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	18.1	4.4	mg/kg	1	03/02/19	03/04/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>
Thallium	< 1.1	1.1	mg/kg	1	03/02/19	03/04/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>
Vanadium	37.8	5.6	mg/kg	1	03/02/19	03/04/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA46240

(2) Prep QC Batch: MP12752



4.2 **4** 



11 of 179

JC83681A

Client Sample ID: Lab Sample ID: Matrix: Project:	BS-B2Date Sampled:03/01/19JC83681-2ADate Sampled:03/01/19SO - SoilDate Received:03/01/19PPG Site 107, 18 Chapel Avenue, Jersey City, NJPercent Solids:88.3								
General Chemistry	,								
Analyte		Result	RL	Units	DF	Analyzed	By	Method	
Chromium, Trivaler	nt <sup>a</sup>	104	1.6	mg/kg	1	03/08/19 16:56	RI	SW846 6010/7196A M	

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

Page 1 of 1





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 <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	76.3	1.7	mg/kg	1	03/02/19	03/04/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	21.2	6.7	mg/kg	1	03/02/19	03/04/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>
Thallium	< 1.7	1.7	mg/kg	1	03/02/19	03/04/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>
Vanadium	20.2	8.4	mg/kg	1	03/02/19	03/04/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA46240

(2) Prep QC Batch: MP12752



4.3 **4** 



Client Sample ID: Lab Sample ID: Matrix: Project:	BS-D18       JC83681-3A       Date Sampled: 03/01/19         SO - Soil       Date Received: 03/01/19         PPG Site 107, 18 Chapel Avenue, Jersey City, NJ       Freent Solids: 59.7							
General Chemistry								
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivaler	nt <sup>a</sup>	76.3	2.4	mg/kg	1	03/08/19 16:58	RI	SW846 6010/7196A M

Page 1 of 1

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





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 <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	17.8	1.4	mg/kg	1	03/02/19	03/04/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	14.5	5.6	mg/kg	1	03/02/19	03/04/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>
Thallium	< 1.4	1.4	mg/kg	1	03/02/19	03/04/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>
Vanadium	23.4	7.0	mg/kg	1	03/02/19	03/04/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA46240

(2) Prep QC Batch: MP12752



4.4 **4** 



Client Sample ID: Lab Sample ID: Matrix: Project:	BS-D17TDate Sampled:03/01/19JC83681-4ADate Sampled:03/01/19SO - SoilDate Received:03/01/19PPG Site 107, 18 Chapel Avenue, Jersey City, NJ71.9									
General Chemistry										
Analyte		Result	RL	Units	DF	Analyzed	By	Method		
Chromium, Trivaler	nt <sup>a</sup>	< 2.0	2.0	mg/kg	1	03/08/19 16:58	RI	SW846 6010/7196A M		

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







Client Sample ID: Lab Sample ID: Matrix: Project:	BS-B2 JC83681-2RT SO - Soil PPG Site 107, 18 Cha	pel Avenue	e, Jersey Cit	y, NJ	Date Sampl Date Receiv Percent Soli	ed: 03 ved: 03 ids: 88	3/01/19 3/01/19 3.3	
General Chemistry	7							
Analyte	Result	RL	Units	DF	Analyzed	By	Method	

1

03/29/19 11:30 MP

#### **Report of Analysis**

 Sulfide Screen b
 NEGATIVE
 1
 03/29/19 11:30 MP
 SM450052- 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

%

(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.

0.20

0.47 J

(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.

Iron, Ferrous <sup>a</sup>

ASTM D3872-86



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Arc	adis	PPG Site 1	07 (Jersey Ci	ty)																							DW - Drinking Water GW - Ground Water
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City Net	State Z wtown, PA 18	o City 140 Jersey City	,	State NJ	Company	Name																					SL-Skudge SED-Sediment
Project Mat	Contact E-mail	Project # NP000770.0	0001		Street Ad	dress																					LIQ - Other Liquid AIR - Air
Phone 610	# 0.755.7080	Client Purchas	e Order #		City					State			1	ζp΄	٦		E										SOL - Other Solid WP - Wipe FB - Field Blank
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2	BS-E18		3/4/19	1210	DH	G	so	1		_	-	1	-	_	$\square$	×	X	×	X	×	×	×	-				(18
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INITIAL ASESSMENT 2 3A LABEL VERIFICATION

SGS Post Ex Sample CCCs Template 20190109.xisx

JC83762: Chain of Custody Page 1 of 3



E

5.2

СЛ



Client Sample ID: Lab Sample ID: Matrix:	FB(20190304) JC83762-1 AQ - Field Blank	c Soil			Date Sampled: Date Received:	03/04/19 : 03/04/19
Project:	PPG Site 107, 18	8 Chapel Avenu	ie, Jersey Ci	ty, NJ	Percent Solids:	n/a
General Chemistry	7					
Analyte	Result	t RL	Units	DF	Analyzed	By Method

< 0.010 0.010 Chromium, Hexavalent 03/04/19 21:28 јо mg/l 1 SW846 7196A Redox Potential Vs H2 400 03/06/19 17:19 ев 1 mv ASTM D1498-76 pH <sup>a</sup> 5.75 1 03/04/19 16:20 AS su SM4500H+ B-11

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

Page 1 of 1







Client Sample ID:	BS-E18		
Lab Sample ID:	JC83762-2	Date Sampled:	03/04/19
Matrix:	SO - Soil	Date Received:	03/04/19
		<b>Percent Solids:</b>	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

#### Page 1 of 1

4.2



Client Sample ID:	BS-E17		
Lab Sample ID:	JC83762-3	Date Sampled:	03/04/19
Matrix:	SO - Soil	Date Received:	03/04/19
		<b>Percent Solids:</b>	53.2
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

#### **General Chemistry**

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent Redox Potential Vs H2 Solids Percent	< 0.75 <b>UJ</b> - 339 53 2	0.75	mg/kg mv %	1 1 1	03/09/19 10:58 03/07/19 00:20 03/05/19 17:30	RI EB BG	SW846 3060A/7196A ASTM D1498-76M SM2540 G 18TH ED MOD
pH	6.92 J		su	1	03/07/19 00:15	EB	SW846 9045D

#### Page 1 of 1

4.3



Lab Sample ID:JC83762-4Date Sampled:03/04/19Matrix:SO - SoilDate Received:03/04/19Percent Solids:64.4	Client Sample ID:	CS-F18		
Matrix:     SO - Soil     Date Received:     03/04/19       Percent Solids:     64.4	Lab Sample ID:	JC83762-4	Date Sampled:	03/04/19
Percent Solids: 64.4	Matrix:	SO - Soil	Date Received:	03/04/19
Project: DDC Site 107 18 Chanal Avanua, Jarcov City, NJ			<b>Percent Solids:</b>	64.4
rioject. FFG site 107, 18 Chaper Avenue, Jersey City, NJ	Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

#### **General Chemistry**

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent Redox Potential Vs H2	< 0.62 UJ-	0.62	mg/kg my	1 1	03/09/19 10:58	RI FB	SW846 3060A/7196A
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

#### Page 1 of 1

4.4



_		Repo	rt of An	alysis		Page 1 of 1
Client Sample ID: BS-E	18					
Lab Sample ID: JC83	762-2R				Date Sampled: 03	/04/19
Matrix: SO -	Soil				Date Received: 03	/04/19
		_			Percent Solids: 73	.9
Project: PPG	Site 107, 18 Cha	apel Avenue	, Jersey Cit	y, 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

4.1



_		Repo	rt of An	alysis	Page 1 of 1
Client Sample ID: Lab Sample ID: Matrix:	BS-E17 JC83762-3R SO - Soit				<b>Date Sampled:</b> 03/04/19 <b>Date Received:</b> 03/04/19 <b>Date Received:</b> 03/04/19
Project: General Chemistry	PPG Site 107, 18 Chap	el Avenue	, Jersey Cit	y, NJ	Percent Solids: 53.2
Analyte	Result	RL	Units	DF	Analyzed By Method
Chromium, Hexavale	ent 2.1	0.75	mg/kg	1	03/22/19 12:51 RI SW846 3050A/7196A



SGS LabLink@1042801 15:36 14-Jun-2019

		Repo	rt of An	alysis		Page 1 of 1
Client Sample ID	: CS-F18				<b>D</b> -4- S	4
Lab Sample ID: Matrix:	$JC_{00}$ $- Soil$				Date Sampled: 03/04/19	ω ω
Matrix.	50 - 501				Percent Solids: 64.4	´
Project:	PPG Site 107, 18 Ch	apel Avenue	, Iersey Cit	y, NJ		
General Chemistr	ry					
Analyte	Result	RL	Units	DF	Analyzed By Met	hod
Chromium, Hexav	valent 20.0	0.62	mg/kg	1	03/22/19 12:51 RI SW8	46 3060A/7196A



#### SGS LabLink@1042801 15:36 14-Jun-2019

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		

# **Report of Analysis**

**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 <sup>1</sup>	SW846 3010A <sup>2</sup>
Chromium	< 10	10	ug/l	1	03/05/19	03/05/19 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>
Nickel	< 10	10	ug/l	1	03/05/19	03/05/19 ND	SW846 6010D 1	SW846 3010A <sup>2</sup>
Thallium	< 10	10	ug/l	1	03/05/19	03/05/19 ND	SW846 6010D 1	SW846 3010A <sup>2</sup>
Vanadium	< 50	50	ug/l	1	03/05/19	03/05/19 ND	SW846 6010D 1	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA46248

(2) Prep QC Batch: MP12856



44

4



8 of 118

Client Sample ID: Lab Sample ID: Matrix: Project:	FB(20190 JC83762- AQ - Fiel PPG Site	)304) 1A d Blank Soil 107, 18 Chap	el Avenue,	Jersey Cit	Date Sampled Date Received Percent Solids	: 03 : 03 : n/a	/04/19 /04/19 a	
General Chemistry								
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivaler	nt <sup>a</sup>	< 0.020	0.020	mg/l	1	03/05/19 17:09	ND	SW846 6010/7196A M

Page 1 of 1

44

4

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



Client Sample ID:	BS-E18		
Lab Sample ID:	JC83762-2A	Date Sampled:	03/04/19
Matrix:	SO - Soil	Date Received:	03/04/19
		<b>Percent Solids:</b>	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 <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	78.6	1.3	mg/kg	1	03/05/19	03/05/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	520	5.2	mg/kg	1	03/05/19	03/05/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>
Thallium	< 1.3	1.3	mg/kg	1	03/05/19	03/05/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>
Vanadium	29.9	6.5	mg/kg	1	03/05/19	03/05/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA46248

(2) Prep QC Batch: MP12851



4.2 4



10 of 118
Client Sample ID: Lab Sample ID: Matrix: Project:	BS-E18 JC83762- SO - Soil PPG Site	2A 107, 18 Cha	pel Avenue,	Jersey Cit	y, NJ	Date Sampled: Date Received Percent Solids	03, 03, 73	/04/19 /04/19 .9
General Chemistry								
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivaler	nt <sup>a</sup>	77.2	1.8	mg/kg	1	03/09/19 10:54	RI	SW846 6010/7196A M

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

Page 1 of 1





Client Sample ID:	BS-E17		
Lab Sample ID:	JC83762-3A	Date Sampled:	03/04/19
Matrix:	SO - Soil	Date Received:	03/04/19
		<b>Percent Solids:</b>	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 <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	129	1.8	mg/kg	1	03/05/19	03/05/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	77.6	7.2	mg/kg	1	03/05/19	03/05/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>
Thallium	< 1.8	1.8	mg/kg	1	03/05/19	03/05/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>
Vanadium	72.7	9.0	mg/kg	1	03/05/19	03/05/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA46248

(2) Prep QC Batch: MP12851



4.3 **4** 



Client Sample ID: Lab Sample ID: Matrix:	BS-E17 JC83762- SO - Soil	-3A	1.4	I O'	NI	Date Sampled Date Received Percent Solids	: 03 : 03 : 53	/04/19 /04/19 .2		
Project:       PPG Site 107, 18 Chapel Avenue, Jersey City, NJ         General Chemistry										
Analyte		Result	RL	Units	DF	Analyzed	By	Method		
Chromium, Trivaler	nt <sup>a</sup>	129	2.6	mg/kg	1	03/09/19 10:58	RI	SW846 6010/7196A M		

Page 1 of 1

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





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		
L			

**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 <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium <sup>a</sup>	84.8	4.6	mg/kg	3	03/05/19	03/05/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	2810	18	mg/kg	3	03/05/19	03/05/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>
Thallium <sup>a</sup>	< 4.6	4.6	mg/kg	3	03/05/19	03/05/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>
Vanadium	24.6	7.7	mg/kg	1	03/05/19	03/05/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA46248

(2) Prep QC Batch: MP12851

(a) Elevated detection limit due to dilution required for high interfering element.

Page 1 of 1





Client Sample ID: Lab Sample ID: Matrix: Project:	CS-F18 JC83762- SO - Soil PPG Site	4A 107, 18 Cha	apel Avenue	Date Sampled: Date Received Percent Solids	03 03 64	03/04/19 03/04/19 64.4		
General Chemistry	,							
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivaler	nt <sup>a</sup>	84.8	5.2	mg/kg	1	03/09/19 10:58	RI	SW846 6010/7196A M

Page 1 of 1

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





Client Sample ID: Lab Sample ID: Matrix: Project:	ample ID:BS-E18apple ID:JC83762-2RTSO - SoilPPG Site 107, 18 Chapel Avenue, Jersey City, NJ					Date Sampled:03/04Date Received:03/04Percent Solids:73.9		
General Chemistry	7	•	· •					
Analyte	Result	RL	Units	DF	Analyzed	By	Method	
Iron, Ferrous <sup>a</sup>	1.1 J	0.20	%	1	03/29/19 11:30	MP	ASTM D3872-86	

mg/kg

1

## **Report of Analysis**

Page 1 of 1

SM4500S2- A-11 R

LLOYD KAHN 1988 MOD

03/29/19 11:30 MP

03/29/19 22:28 јо

(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.

140

NEGATIVE

126000 J

(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.

-Sulfide Screen b

Total Organic Carbon c





**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:

				Sample		Analysis		
SDG	Sample ID	Lab ID	Matrix	Collection Date	Parent Sample	Cr VI	MET	MISC
	FB(20190307)	JC83998-1	Water	3/7/2019		х	Х	х
JC83998	BS-I15	JC83998-2	Soil	3/7/2019		х	х	х
SDG JC83998 JC84093 JC84109	BS-H16	JC83998-3	Soil	3/7/2019		x	х	х
	FB(20190308)	JC84093-1	Water	3/8/2019		х	Х	х
	BS-C17A	JC84093-2	Soil	3/8/2019		х	Х	х
JC84093	BS-I16	JC84093-3	Soil	3/8/2019		х	Х	х
	BS-E17	JC84093-4	Soil	3/8/2019		х	Х	х
	FB(20190308)-A	JC84109-1	Water	3/8/2019			Х	
	SW-A21(0.0-0.5)	JC84109-2	Soil	3/8/2019		х	Х	х
	SW-A21(2.0-2.5)	JC84109-3	Soil	3/8/2019		х	Х	х
	SW-A20(0.0-0.5)	JC84109-4	Soil	3/8/2019		Х	Х	х
	SW-A20(2.0-2.5)	JC84109-5	Soil	3/8/2019		х	Х	х
JC84109	SW-A19(0.0-0.5)	JC84109-6	Soil	3/8/2019		х	Х	х
	SW-A19(2.0-2.5)	JC84109-7	Soil	3/8/2019		х	Х	х
	SW-A19(4.0-4.5)	JC84109-8	Soil	3/8/2019		х	Х	х
	SW-A18(0.0-0.5)	JC84109-9	Soil	3/8/2019		х	Х	х
	SW-A18(2.0-2.5)	JC84109-10	Soil	3/8/2019		Х	Х	х
	SW-A18(4.0-4.5)	JC84109-11	Soil	3/8/2019		х	х	х

#### 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. <u>SDGs #JC83998 and JC84093</u>: 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.

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

Note:

QA - Quality Assurance

<sup>1</sup> <u>SDG #JC84109</u>: 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  $\pm$  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	Rep	orted	Perfor Acce	rmance ptable	Not
	No	Yes	No	Yes	Required
Inductively Coupled Plasma-Atomic Emission Spectromet	ry (ICP-AE	S)			
Tier II Validation					
Holding Times		x		х	
Reporting limits (units)		x		х	
Blanks					
A. Instrument Blanks		x		х	
B. Method Blanks		x		х	
C. Equipment/Field Blanks		х		Х	
Laboratory Control Sample (LCS)		x		х	
Laboratory Control Sample Duplicate (LCSD)	Х				Х
LCS/LCSD Precision (RPD)	х				Х
Matrix Spike (MS) %R	х				Х
Matrix Spike Duplicate (MSD) %R	х				Х
MS/MSD Precision (RPD)	х				Х
Field/Lab Duplicate (RPD)	х				Х
ICP Serial Dilution %D	х				Х
Total vs. Dissolved	х				Х
Reporting Limit Verification		Х		Х	
Tier III Validation					
Initial Calibration Verification		x		х	
Continuing Calibration Verification		Х		Х	
CRDL Standard Recovery		x		х	
ICP Interference Check		x		х	
ICP-MS Internal Standards	Х				Х
Transcription/calculations acceptable		Х		Х	
Raw Data	Х				Х
Reporting limits adjusted to reflect sample dilutions		Х		Х	
Notes:					

%R Percent recovery

RPD Relative percent difference

%D Percent difference

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#### 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.

<u>SDG #JC84109</u>: 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.

<u>SDGs #JC83998, JC84093, and JC84109</u>: 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
	Hexavalent Chromium, Insoluble	69.1%	68.2%
BS-H16	Hexavalent Chromium, Soluble	< 50%	< 50%
	Hexavalent Chromium, Insoluble	64.7%	64.9%
BS-E17	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 <sup>1</sup>
	Non-detect	UJ-
Spike recovery $\ge 50\%$ but $< 75\%$	Detect	J-
0 H	Non-detect	R
Spike recovery < 50%	Detect	R
Spike recovery > 125%	Non-detect	No Action
Spike recovery > 125% but $\leq$ 150%	Detect	J+
Spike recovery > 150%	Detect	R

Notes:

<sup>1</sup> 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.

<u>SDGs #JC83998 and JC84093</u>: The original analyses of the field samples are usable with appropriate qualification. No sample results were rejected.

<u>SDG #JC84109</u>: 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%.

<u>SDG #JC84109</u>: The PDS analysis performed on sample location SW-A18(0.0-0.5) exhibited recoveries within the control limits.

<u>SDGs #JC83998 and JC84093</u>: 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
	Non-detect	UJ-
PDS recovery < 85%	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.

<u>SDGs #JC83998</u>, <u>JC84093</u>: The laboratory duplicate analysis performed on sample locations BS-H16, BS-E17 exhibited results within the control limit.

<u>SDG #JC84109</u>: 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 Detect	UJ J
Parent sample and/or laboratory duplicate sample result < four times the RL	± RL	Non-detect Detect	UJ 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.

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

## DATA VALIDATION CHECKLIST FOR HEXAVALENT CHROMIUM

%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)		Analysis: 5 days	Analysis: 5 days	
SW-A19(0.0-0.5)	SW846 9045D	< 24 hours of receipt by laboratory		
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)				
BS-I15		Analysis: 6 days		
BS-H16		Analysis: o days		
BS-E17	4STM D3872-86	Analysis: 21 days	< 21 hours from collection	
BS-H16		Analysis: 22 days		

Sample Locations	Method	Holding Time	Criteria
BS-E17	SM4500S2.4	Analysis: 21 days	< 7 days from collection
BS-H16	- SM430032-A	Analysis: 22 days	
BS-E17	Llovd Kabp	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.

	Qualification		
Criteria	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.

<u>SDGs #JC83998 and JC84093</u>: The laboratory duplicate analysis was not performed using a sample from these SDGs.

<u>SDGs #JC84109</u>: 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	Rep	orted	Perfor Accep	mance otable	Not Required
9045D, ASTM D1498-76	No	Yes	No	Yes	Required
Miscellaneous Instrumentation					
Tier II Validation					
Holding times		x	x		
Reporting limits (units)		x		X	
Blanks					
A. Instrument Blanks		х		Х	
B. Method blanks		х		Х	
C. Equipment blanks		Х		X	
Laboratory Control Sample (LCS) %R		Х		Х	
Laboratory Control Sample Duplicate (LCSD) %R	Х				Х
LCS/LCSD Precision (RPD)	Х				Х
Matrix Spike (MS) %R	Х				Х
Matrix Spike Duplicate (MSD) %R	Х				Х
MS/MSD Precision (RPD)	Х				Х
Field/Lab Duplicate (RPD)		Х		X	
Dilution Factor		Х		X	
Tier III Validation			·		<u> </u>
Initial calibration %RSD or correlation coefficient	Х				Х
Continuing calibration %R	Х				Х
Raw Data		Х		Х	
Transcription/calculation errors present		x		Х	
Reporting limits adjusted to reflect sample dilutions		x		Х	
Notes:					

%R Percent recovery

RPD Relative percent difference

VALIDATION PERFORMED BY: Jennifer Singer

SIGNATURE:

Annifer Alinger

DATE: July 15, 2019

PEER REVIEW: Dennis Capria

DATE: July 18, 2019

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# CHAIN OF CUSTODY CORRECTED SAMPLE ANALYSIS DATA SHEETS



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Mark       PC II       NP000 P D0.003       Oty       Bate       Zo         UP 01, 52.1, 52.2       Fail       Oty       Bate       Zo       Total       Sol. Concession         UP 01, 52.1, 52.2       Fail       Oty       Bate       Zo       Total       Sol. Concession         C.C.F.(II, D. It/L, Day       Total       Sol. Concession       Aarroor.       Sol. Concession       Sol. Concession         C.C.F.(II, D. It/L, Day       Total       Total       Concession       Aarroor.       Sol. Concession         Law       Sol. Concession       Total       Total       Aarroor.       Sol. Concession       Sol. Concession         Law       Sol. Concession       Total       Total       Aarroor.       Sol. Concession       Sol. Concession         Law       Total       Sol. Concession       Marcon       Sol. Concession       Sol. Concession       Sol. Concession         Law       Sol. Concession       Total       Sol. Concession	Project Contact E-mail	Project #			Street Addre	355								5	2	5						{			LIQ - Other Liquid
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Form:SM088-03C (revised 2/12/18)

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

JC83998: Chain of Custody Page 1 of 4



5.2

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#### SGS LabLink@1045417 08:35 10-Jul-2019

Client Sample ID: Lab Sample ID: Matrix:	FB(20190307) JC83998-1 AQ - Field Blank Soil				Date Sample Date Receive Percent Solie	ed: 03 ed: 03 ds: n/a	/07/19 /07/19 a	
Project:	PPG Site 107, 18 Cha	pel Avenue	e, Jersey Ci	ty, NJ				
General Chemistry								
Analyte	Result	RL	Units	DF	Analyzed	By	Method	

## **Report of Analysis**

#### < 0.010 0.010 Chromium, Hexavalent 03/07/19 22:06 јо mg/l 1 Redox Potential Vs H2 469 03/12/19 20:48 ев 1 mv pH <sup>a</sup> 5.68 1 $03/07/19 \ 17:03 \ \text{SUB} \ \text{SM4500H+ B-11}$ su

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

SW846 7196A

ASTM D1498-76





Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		
		Percent Solids:	74.4
Matrix:	SO - Soil	Date Received:	03/07/19
Lab Sample ID:	JC83998-2	Date Sampled:	03/07/19
Client Sample ID:	BS-I15		

#### 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

#### Page 1 of 1

4.2

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		
Conoral Chamistry			

#### **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

#### Page 1 of 1

4.3



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		Repo	rt of An	alysis		Page 1 of 1
Client Sample ID: BS-I1	5					
Lab Sample ID: JC839	998-2R				<b>Date Sampled:</b> 03/07/19	
Matrix: SO -	Soil				<b>Date Received:</b> 03/07/19	
					Percent Solids: 74.4	
Project: PPG	Site 107, 18 Cha	pel Avenue	, Jersey Cit	y, NJ		
General Chemistry						
Analyte	Result	RL	Units	DF	Analyzeð By Metl	nod
Chromium, Hexavalent	< 0.54	0.54	mg/kg	1	03/22/19 17:42 RI SW84	6 <del>30</del> 60A/7196A



4.1

SGS LabLink@1045417 08:36 10-Jul-2019

		Repo	rt of An	alysis	Pa	ge 1 of 1
Client Sample ID:	BS-H16				Date Sampled • 03/07/19	4
Matrix:	SO - Soil				Date Banpied: 03/07/19 Date Received: 03/07/19 Percent Solids: 71.0	
Project:	PPG Site 107, 18 Ch	apel Avenue	, Jersey Cit	y, NJ	reicent sonus. 71.0	4
General Chemistr	y					
Analyte	Result	RL	Units	DF	Analyzed By Method	
Chromium, Hexava	alent < 0.56	0.56	mg/kg	1	03/22/19 17:39 RI SW846 3060	A/7196A



Client Sample ID: Lab Sample ID: Matrix: Project:	BS-H16 JC83998-3RT SO - Soil PPG Site 107, 18 Cha	pel Avenue	e, Jersey Cit	y, NJ	Date Sampl Date Receiv Percent Sol	ed: 03 ved: 03 ids: 71	8/07/19 8/07/19 1.0	
General Chemistry	,							1
Analyte	Result	RL	Units	DF	Analyzed	By	Method	

1

1

03/29/19 11:30 MP

03/29/19 11:30 MP

03/29/19 18:01 јо

## **Report of Analysis**

Page 1 of 1

ASTM D3872-86

-SM4500S2- A-11 R

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.

%

mg/kg

0.20

140

0.48 J

22800 J

NEGATIVE

(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.

Iron, Ferrous <sup>a</sup>

Sulfide Screen h

Total Organic Carbon c



#### SGS LabLink@1045417 08:36 10-Jul-2019

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
		<b>Percent Solids:</b>	n/a
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

# **Report of Analysis**

#### **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 <sup>1</sup>	SW846 3010A <sup>2</sup>
Chromium	< 10	10	ug/l	1	03/07/19	03/08/19 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>
Nickel	< 10	10	ug/l	1	03/07/19	03/08/19 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>
Thallium	< 10	10	ug/l	1	03/07/19	03/08/19 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>
Vanadium	< 50	50	ug/l	1	03/07/19	03/08/19 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA46274

(2) Prep QC Batch: MP12932



4



#### SGS LabLink@1045417 08:36 10-Jul-2019

Client Sample ID: Lab Sample ID: Matrix: Project:	FB(20190307) JC83998-1A AQ - Field Blank Soil PPG Site 107, 18 Chapel Avenue, Jersey City, NJ					Date Sampled Date Received Percent Solids	: 03/ : 03/ : n/a	/07/19 /07/19
General Chemistry								
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivaler	nt <sup>a</sup>	< 0.020	0.020	mg/l	1	03/08/19 17:46	ND	SW846 6010/7196A M

## **Report of Analysis**

Page 1 of 1

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





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 <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	15.1	1.3	mg/kg	1	03/07/19	03/08/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	21.5	5.3	mg/kg	1	03/07/19	03/08/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>
Thallium	< 1.3	1.3	mg/kg	1	03/07/19	03/08/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>
Vanadium	16.9	6.7	mg/kg	1	03/07/19	03/08/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA46274

(2) Prep QC Batch: MP12917



4.2 **4** 


Client Sample ID: Lab Sample ID: Matrix: Project:	BS-I15 JC83998- SO - Soil PPG Site	-2A 107, 18 Ch	apel Avenue,	Jersey Cit	y, NJ	Date Sampled Date Received Percent Solids	: 03, : 03, : 74	/07/19 /07/19 .4
General Chemistry								
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivaler	nt <sup>a</sup>	15.1	1.8	mg/kg	1	03/15/19 23:00	JOO	SW846 6010/7196A M

Page 1 of 1

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

4.2



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 <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	12.6	1.4	mg/kg	1	03/07/19	03/08/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	11.9	5.4	mg/kg	1	03/07/19	03/08/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>
Thallium	< 1.4	1.4	mg/kg	1	03/07/19	03/08/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>
Vanadium	18.0	6.8	mg/kg	1	03/07/19	03/08/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA46274

(2) Prep QC Batch: MP12917







Client Sample ID: Lab Sample ID: Matrix: Project:	BS-H16 JC83998- SO - Soil PPG Site	3A 107, 18 Cha	upel Avenue	, Jersey Cit	y, NJ	Date Sampled Date Received Percent Solids	: 03. : 03. : 71	/07/19 /07/19 .0
General Chemistry	,							
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivaler	nt <sup>a</sup>	12.6	2.0	mg/kg	1	03/15/19 22:52	JOO	SW846 6010/7196A M

Page 1 of 1

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





SGS	SP EB	>	CH SO TEL.	AIN 3S Nor 2235 Ro 732-329 w	OF th An ute 130 -0200 ww.sg	FAX: 5	JST Inc E on, NJ ( 732-329 shsusa	OD ayto 8810 3499	Y n 3480					FED-EX	Tracking	5				Bourd On SGS JOD		<u>,⊥</u>	of_ \7 \84	9-179
Client / Reporting Information			Projec	t Inforn	nation													Reque	sted Ar	nalysis				Matrix Codes
Company Name: Ascadis	Project Name	PA 3	· se	~ (	.4	ر _	1.4	1	07						11 1	Ę								DW - Drinking Water GW - Ground Water
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Project Contract E-mail MGH Bell	Project#	770.00	5	Street A	idress				01-1-					24	1	t t	ł	þ		3				LIQ - Other Liquid AIR - Air SOL - Other Sold
646, 752, 5629 Sampler(s) Name(s) Phone #	Project Manas	se Order #		Attention					State			20	P		ale	val	2	3	( Cm	adi				WP - Wipe FB - Field Blank EB-Equipment Blank
Christ eifelli	Jin	McLaui	lin											14	15	×.	2	LC	2	. र्ड				TB - Trip Blank
sos Sampla # Field ID / Point of Collection	MEOH/DI Viai #	Date	Time	Sampled	Grab (G) Comp (C	Matrix	# of bottles	兌	HOS	HNO, P	BNON	MEOH 100	ENCORE	11	F	Ŧ	£	2	4	>				LAB USE ONLY
( FB(20190308)		3/8/19	0845	CC	6	FB	2			(	1			X	X	X	χ	χ	x	X				
2 BS-CI7A		3/8/19	1100	(<	G	50	Í				i			X	X	X	X	X	χ	X				
3 BS-I16		218/19	4130	CC	9	So	1				i			X	X	X	Х	X	X	X				AIG
4 BS-E17		3/8/19	100	a	6	Sø					1			X	X	X	х	X	X	X				M18
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Turn Around Time (Bu	siness Days	)			1					Deliv	erabl	e	t		-					I	Commer	its / Spe	cial Inst	ructions
	Approved By (S	GS PM): / Date:			] Com	mercial "/	A" (Level	1)	2	2'	NYAS	PCate	igory A		-	] DOD-0	QSM5							
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		Sample	Custody n	nust be d	ocume	nted belo	w each t	me sa	mples	chan	ige p	osses	sion, i	ncluding	courier	delivery			201	1444		$\overline{A}$	Grendi	and conditions
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EHSA-QAC-0023-02-FORM-Dayton - Standard COC.xtsx

> JC84093: Chain of Custody Page 1 of 3



5.2

S



Chromium, Hexavalent

Redox Potential Vs H2

pH <sup>a</sup>

< 0.010

467

5.66

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

Analyte	Result	RL	Units	DF	Analyzed	Bv	Method	
General Chemistr	y							
Project:	PPG Site 107, 18 Cha	apel Avenue	e, Jersey Ci	y, NJ			-	
Matrix:	AQ - Field Blank Soil	l			Date Receiv Percent Sol	/ <b>ed:</b> 03 ids: n/	3/08/19 ′a	
Client Sample ID: Lab Sample ID:	FB(20190308) JC84093-1				Date Sampl	ed: 03	3/08/19	

mg/l

mv

su

1

1

1

0.010

### **Report of Analysis**

Page 1 of 1

ASTM D1498-76

03/08/19 20:20 JOO SW846 7196A

 $03/08/19 \ 18:00 \ \text{SUB} \quad \text{SM4500H+ B-11}$ 

03/12/19 21:08 ЕВ

RL = Reporting Limit





Client Sample ID:	BS-C17A		
Lab Sample ID:	JC84093-2	Date Sampled:	03/08/19
Matrix:	SO - Soil	Date Received:	03/08/19
		<b>Percent Solids:</b>	69.9
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

#### **General Chemistry**

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent Redox Potential Vs H2 Solids, Percent	< 0.57 <b>UJ</b> - 263 69.9	0.57	mg/kg mv %	1 1 1	03/14/19 17:30 03/13/19 20:10 03/10/19 14:00	RI EB BG	SW846 3060A/7196A ASTM D1498-76M SM2540 G 18TH ED MOD
pH	6.39 J		su	1	03/13/19 20:03	EB	SW846 9045D

### Page 1 of 1

4.2



Client Sample ID:	BS-I16		
Lab Sample ID:	JC84093-3	Date Sampled:	03/08/19
Matrix:	SO - Soil	Date Received:	03/08/19
		<b>Percent Solids:</b>	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 <mark>UJ-</mark>	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

### Page 1 of 1

4.3



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 <b>UJ</b> -	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

### Page 1 of 1





		Repo	rt of An	alysis	Page 1 of 1
Client Sample ID:	BS-C17A				
Lab Sample ID:	JC84093-2R				<b>Date Sampled:</b> 03/08/19
Matrix:	SO - Soil				<b>Date Received:</b> 03/08/19
					Percent Solids: 69.9
Project:	PPG Site 107, 18 Ch	apel Avenue	Jersey Cit	y, NJ	
General Chemistr	·y				
Analyte	Result	RL	Units	DF	Analyzed By Method
Chromium, Hexav	alent < 0.57	0.57	mg/kg	1	03/22/19 14:11 RI SW846 3060A/7196A



-

		Repo	ort of An	alysis		Page 1 of 1
Client Sample ID:	BS-I16					
Lab Sample ID:	JC84093-3R				<b>Date Sampled:</b> 03/08/19	
Matrix:	SO - Soil				<b>Date Received:</b> 03/08/19	
					Percent Solids: 72.8	
Project:	PPG Site 107, 13	3 Chapel Avenu	e, Jersey Cit	y, NJ		
General Chemistry	y					
Analyte	Resul	t RL	Units	DF	Analyzed By Meth	od
Chromium, Hexava	alent < 0.5	5 0.55	mg/kg	1	03/22/19 14:11 RI SW84	5 3060A/7196A



-

	Report of Analysis								
Client Sample HD:	BS-E17								
Lab Sample ID:	JC84093-4R				<b>Date Sampled:</b> 03/08/19				
Matrix:	SO - Soil				<b>Date Received:</b> 03/08/19				
					Percent Solids: 67.5				
Project:	PPG Site 107, 18 Chap	pel Avenue	, Jersey Cit	y, NJ					
General Chemistr	y								
Analyte	Result	RL	Units	DF	Analyzed By Method				
Chromium, Hexav	alent < 0.59	0.59	mg/kg	1	03/22/19 14:03 RI SW846 3060A77196A				



Client Sample ID: Lab Sample ID: Matrix: Project:	BS-E17 JC84093-4RT SO - Soil PPG Site 107 18 Char	pel Avenue	- Jersey Cit	Date Sampled: 03/08/19   Date Received: 03/08/19   Percent Solids: 67.5				
General Chemistry	Result	RL	Units	DF	Analyzed	By	Method	'

1

1

03/29/19 11:30 MP

03/29/19 11:30 MP

03/29/19 18:27 јо

%

mg/kg

### **Report of Analysis**

(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.

0.20

150

0.80 J

45600 J

NEGATIVE

(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.

Iron, Ferrous <sup>a</sup>

Sulfide Screen h

Total Organic Carbon c



ASTM D3872-86

SM4500S2- A-11 R

LLOYD KAHN 1988 MOD

RL = Reporting Limit



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
		<b>Percent Solids:</b>	n/a
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

### **Report of Analysis**

#### **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 <sup>1</sup>	SW846 3010A <sup>2</sup>
Chromium	< 10	10	ug/l	1	03/11/19	03/11/19 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>
Nickel	< 10	10	ug/l	1	03/11/19	03/11/19 ND	SW846 6010D 1	SW846 3010A <sup>2</sup>
Thallium	< 10	10	ug/l	1	03/11/19	03/11/19 ND	SW846 6010D 1	SW846 3010A <sup>2</sup>
Vanadium	< 50	50	ug/l	1	03/11/19	03/11/19 ND	SW846 6010D 1	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA46281

(2) Prep QC Batch: MP12984







			-		•			-		
Client Sample ID:	FB(20190	)308)								
Lab Sample ID:	JC84093-	1A				<b>Date Sampled:</b> 03/08/19				
Matrix:	AQ - Fiel	d Blank Soil				<b>Date Received:</b> 03/08/19				
						Percent Solids: n/a				
Project:	PPG Site	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ								
General Chemistry	,									
Analyte		Result	RL	Units	DF	Analyzed	By	Method		
Chromium, Trivaler	nt <sup>a</sup>	< 0.020	0.020	mg/l	1	03/11/19 18:51	ND	SW846 6010/7196A M		

### **Report of Analysis**

Page 1 of 1

4.1

4

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





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 <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	15.8	1.5	mg/kg	1	03/11/19	03/11/19 GT	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	14.0	5.8	mg/kg	1	03/11/19	03/11/19 GT	SW846 6010D 1	SW846 3050B <sup>2</sup>
Thallium	< 1.5	1.5	mg/kg	1	03/11/19	03/11/19 GT	SW846 6010D 1	SW846 3050B <sup>2</sup>
Vanadium	22.5	7.3	mg/kg	1	03/11/19	03/11/19 GT	SW846 6010D 1	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA46280

(2) Prep QC Batch: MP12949



4.2 **4** 



Client Sample ID: Lab Sample ID: Matrix: Project:	BS-C17A JC84093-2A SO - Soil PPG Site 107, 18 Chapel Avenue, Jersey City, NJ Date Sampled: 03/08/19 Percent Solids: 69.9								
General Chemistry									
Analyte		Result	RL	Units	DF	Analyzed	By	Method	
Chromium, Trivaler	nt <sup>a</sup>	15.8	2.1	mg/kg	1	03/14/19 17:30	RI	SW846 6010/7196A M	

Page 1 of 1

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







Client Sample ID:	BS-I16		
Lab Sample ID:	JC84093-3A	Date Sampled:	03/08/19
Matrix:	SO - Soil	Date Received:	03/08/19
		<b>Percent Solids:</b>	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 <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	13.2	1.4	mg/kg	1	03/11/19	03/11/19 gt	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	11.5	5.6	mg/kg	1	03/11/19	03/11/19 GT	SW846 6010D 1	SW846 3050B <sup>2</sup>
Thallium	< 1.4	1.4	mg/kg	1	03/11/19	03/11/19 gt	SW846 6010D 1	SW846 3050B <sup>2</sup>
Vanadium	19.7	7.0	mg/kg	1	03/11/19	03/11/19 gt	SW846 6010D 1	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA46280

(2) Prep QC Batch: MP12949



4.3 **4** 



Client Sample ID: Lab Sample ID: Matrix: Project:	BS-I16 JC84093- SO - Soil PPG Site	-3A 107, 18 Cha	npel Avenue,	, Jersey Cit	y, NJ	Date Sampled Date Received Percent Solids	: 03 : 03 : 72	/08/19 /08/19 .8
General Chemistry								
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivaler	nt <sup>a</sup>	13.2	2.0	mg/kg	1	03/14/19 17:30	RI	SW846 6010/7196A M

Page 1 of 1

4.3

4

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



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 <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	15.4	1.5	mg/kg	1	03/11/19	03/11/19 GT	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	13.3	5.9	mg/kg	1	03/11/19	03/11/19 GT	SW846 6010D 1	SW846 3050B <sup>2</sup>
Thallium	< 1.5	1.5	mg/kg	1	03/11/19	03/11/19 GT	SW846 6010D 1	SW846 3050B <sup>2</sup>
Vanadium	21.3	7.3	mg/kg	1	03/11/19	03/11/19 GT	SW846 6010D 1	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA46280

(2) Prep QC Batch: MP12949





Client Sample ID: Lab Sample ID: Matrix: Project:	BS-E17 JC84093- SO - Soil PPG Site	4A 107, 18 Cha	pel Avenue	, Jersey Cit	y, NJ	Date Sampled Date Received Percent Solids	: 03 : 03 : 67	/08/19 /08/19 .5
General Chemistry								
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivaler	nt <sup>a</sup>	15.4	2.1	mg/kg	1	03/14/19 17:27	RI	SW846 6010/7196A M

4.4

4

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





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

JC84109: Chain of Custody

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

Page 1 of 4



5.2 G

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		

### **Report of Analysis**

### **General Chemistry**

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium Hovevelant	21.0	0.77	/1	1	02/15/10 12.00	DI	CW046 2060 A /7106 A
Chiomiuni, riexavalent	51.0	0.77	mg/ kg	1	03/13/19 15.00	KI	SW040 5000A/1190A
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

### Page 1 of 1

4:1



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
		<b>Percent Solids:</b>	63.5
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

### **Report of Analysis**

### **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

### Page 1 of 1

4.2



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
		<b>Percent Solids:</b>	59.9
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

### **Report of Analysis**

### **General Chemistry**

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium Hexavalent	59 5	0.67		1	02/15/10 12:08	DI	SW046 2060 A /7106 A
Chiomuni, mexavalent	50.5	0.07	iiig/ kg	1	03/15/17 15.00	KI	3 W 840 J000A/ /190A
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

### Page 1 of 1

4.3



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
Characteristic Howeverlant	22.2	0.62	ma/ka	1	02/15/10 12:08	DI	SW1946 2060 A /7106 A
Chiomium, mexavalem	23.2	0.02	mg/ kg	1	03/13/17 13.00	NI	5W040 3000A//190A
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

### Page 1 of 1

4.4



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
		<b>Percent Solids:</b>	82.4
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

### **Report of Analysis**

### **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

### Page 1 of 1

4.5



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		

### **Report of Analysis**

### **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 <mark>J</mark>		su	1	03/13/19 21:40	EB	SW846 9045D

### Page 1 of 1

4.6

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
		<b>Percent Solids:</b>	81.1
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

### **Report of Analysis**

### **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

### Page 1 of 1

4.7



Client Sample ID: Lab Sample ID:	SW-A18(0.0-0.5) JC84109-9	Date Sampled:	03/08/19
Matrix:	SO - Soil	Date Received:	03/08/19
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	Percent Solids:	81.6

### **Report of Analysis**

### **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

Page 1 of 1

4.8



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

### Page 1 of 1



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

### Page 1 of 1

4.10 **4** 



Client Sample ID: Lab Sample ID: Matrix: Project:	SW-A21( JC84109- SO - Soil PPG Site	0.0-0.5) 2R 107, 18 Cha	pel Avenue,	Jersey Cit	y, NJ	Date Sampled: Date Received Percent Solids	03 03 52	/08/19 /08/19 .1
General Chemistry	7							
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexava	lent	39.1 J	0.77	mg/kg	1	04/01/19 16:17	RI	SW846 3060A/7196A

Page 1 of 1

44



Client Sample ID: Lab Sample ID: Matrix: Project:	SW-A21( JC84109- SO - Soil PPG Site	2.0-2.5) 3R 107, 18 Cha	pel Avenue,	Jersey Cit	Date Sampled Date Received Percent Solids	: 03 : 03 : 63	3/08/19 3/08/19 3.5	
General Chemistry	7							
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexava	lent	34.0 J	0.63	mg/kg	1	04/01/19 16:17	RI	SW846 3060A/7196A

Page 1 of 1



Client Sample ID: Lab Sample ID: Matrix: Project:	SW-A20( JC84109- SO - Soil PPG Site	0.0-0.5) 4R 107, 18 Cha	pel Avenue,	Jersey Cit	y, NJ	Date Sampled:03/08/19Date Received:03/08/19Percent Solids:59.9			
General Chemistry	7								
Analyte		Result	RL	Units	DF	Analyzed	By	Method	
Chromium, Hexava	lent	52.3 J	0.67	mg/kg	1	04/01/19 16:17	RI	SW846 3060A/7196A	

Page 1 of 1



Client Sample ID: Lab Sample ID: Matrix: Project:	SW-A20( JC84109- SO - Soil PPG Site	2.0-2.5) 5R 107, 18 Cha	apel Avenue	, Jersey Cit	y, NJ	Date Sampled Date Received Percent Solids	: 03 : 03 : 64	7/08/19 7/08/19 4
General Chemistry	,							
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexava	lent	138 J	3.1	mg/kg	5	04/01/19 16:19	RI	SW846 3060A/7196A

Page 1 of 1



Client Sample ID: Lab Sample ID: Matrix: Project:	SW-A19( JC84109- SO - Soil PPG Site	(0.0-0.5) -6R 107, 18 Cha	pel Avenue	, Jersey Cit	y, NJ	Date Sampled Date Received Percent Solids	: 03 : 03 : 82	3/08/19 3/08/19 2.4
General Chemistry	7							
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexava	lent	24.6 J	0.49	mg/kg	1	04/01/19 16:17	RI	SW846 3060A/7196A

Page 1 of 1


Client Sample ID: Lab Sample ID: Matrix: Project:	SW-A19( JC84109- SO - Soil PPG Site	2.0-2.5) 7R 107, 18 Cha	pel Avenue,	Jersey Cit	Date Sampled Date Received Percent Solids	: 03 : 03 : 81	/08/19 /08/19 .7	
General Chemistry	7							
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexava	lent	102 J	2.4	mg/kg	5	04/01/19 16:19	RI	SW846 3060A/7196A

Page 1 of 1



Client Sample ID: Lab Sample ID: Matrix: Project:	SW-A19(4.0-4.5) JC84109-8R Date Sampled: 03/08/19   SO - Soil Date Received: 03/08/19   PPG Site 107, 18 Chapel Avenue, Jersey City, NJ 81.1								
General Chemistry	7								
Analyte		Result	RL	Units	DF	Analyzed	By	Method	
Chromium, Hexava	lent	3.9 J	0.49	mg/kg	1	04/01/19 16:17	RI	SW846 3060A/7196A	

Page 1 of 1



Client Sample ID: Lab Sample ID: Matrix: Project:	SW-A18(0.0-0.5) JC84109-9R Date Sampled: 03/08/19   SO - Soil Date Received: 03/08/19   PPG Site 107, 18 Chapel Avenue, Jersey City, NJ 81.6								
General Chemistry	7								
Analyte		Result	RL	Units	DF	Analyzed	By	Method	
Chromium, Hexava	lent	11.0 J	0.49	mg/kg	1	04/01/19 16:07	RI	SW846 3060A/7196A	

Page 1 of 1



Client Sample ID: Lab Sample ID: Matrix: Project:	SW-A18(2.0-2.5) JC84109-10R Date Sampled: 03/08/19   SO - Soil Date Received: 03/08/19   PPG Site 107, 18 Chapel Avenue, Jersey City, NJ Percent Solids: 79.2									
General Chemistry	7									
Analyte		Result	RL	Units	DF	Analyzed	By	Method		
Chromium, Hexava	lent	25.9 J	0.51	mg/kg	1	04/01/19 16:17	RI	SW846 3060A/7196A		

Page 1 of 1



Client Sample ID: Lab Sample ID: Matrix: Project:	SW-A18(4.0-4.5) JC84109-11R Date Sampled: 03/08/19   SO - Soil Date Received: 03/08/19   PPG Site 107, 18 Chapel Avenue, Jersey City, NJ Percent Solids: 82.9									
General Chemistry	7									
Analyte		Result	RL	Units	DF	Analyzed	By	Method		
Chromium, Hexava	lent	6.8 J	0.48	mg/kg	1	04/01/19 16:17	RI	SW846 3060A/7196A		

Page 1 of 1

#### SGS LabLink@1045417 08:40 10-Jul-2019

Client Sample ID:	FB(20190308)-A		
Lab Sample ID:	JC84109-1A	Date Sampled:	03/08/19
Matrix:	AQ - Field Blank Soil	Date Received:	03/08/19
		<b>Percent Solids:</b>	n/a
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

# **Report of Analysis**

#### **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 <sup>1</sup>	SW846 3010A <sup>2</sup>
Chromium	< 10	10	ug/l	1	03/11/19	03/11/19 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>
Nickel	< 10	10	ug/l	1	03/11/19	03/11/19 ND	SW846 6010D 1	SW846 3010A <sup>2</sup>
Thallium	< 10	10	ug/l	1	03/11/19	03/11/19 ND	SW846 6010D 1	SW846 3010A <sup>2</sup>
Vanadium	< 50	50	ug/l	1	03/11/19	03/11/19 ND	SW846 6010D 1	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA46281

(2) Prep QC Batch: MP12984



4

4



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 <sup>a</sup>	< 12	12	mg/kg	3	03/11/19	03/11/19 GT	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	2400	5.9	mg/kg	3	03/11/19	03/11/19 GT	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	454	7.9	mg/kg	1	03/11/19	03/11/19 GT	SW846 6010D 1	SW846 3050B <sup>2</sup>
Thallium <sup>a</sup>	< 5.9	5.9	mg/kg	3	03/11/19	03/11/19 GT	SW846 6010D 1	SW846 3050B <sup>2</sup>
Vanadium <sup>a</sup>	802	30	mg/kg	3	03/11/19	03/11/19 GT	SW846 6010D 1	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA46280

(2) Prep QC Batch: MP12949

(a) Elevated detection limit due to dilution required for high interfering element.

Page 1 of 1





Client Sample ID: Lab Sample ID: Matrix: Project:	SW-A21(0.0-0.5) JC84109-2A Date Sampled: 03/08/19   SO - Soil Date Received: 03/08/19   PPG Site 107, 18 Chapel Avenue, Jersey City, NJ Percent Solids: 52.1								
General Chemistry	7								
Analyte		Result	RL	Units	DF	Analyzed	By	Method	
Chromium, Trivaler	nt <sup>a</sup>	2370 2360	6.7	mg/kg	1	03/15/19 13:08	RI	SW846 6010/7196A M	

Page 1 of 1

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



4



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 <sup>a</sup>	< 6.1	6.1	mg/kg	2	03/11/19	03/11/19 GT	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium <sup>a</sup>	1020	3.1	mg/kg	2	03/11/19	03/11/19 GT	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	170	6.1	mg/kg	1	03/11/19	03/11/19 GT	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Thallium <sup>a</sup>	< 3.1	3.1	mg/kg	2	03/11/19	03/11/19 GT	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Vanadium	283	7.6	mg/kg	1	03/11/19	03/11/19 GT	SW846 6010D 1	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA46280

(2) Prep QC Batch: MP12949

(a) Elevated detection limit due to dilution required for high interfering element.

Page 1 of 1





Client Sample ID: Lab Sample ID: Matrix: Project:	SW-A21(2.0-2.5)   JC84109-3A   SO - Soil   Date Sampled: 03/08/19   Date Received: 03/08/19   Percent Solids: 63.5								
General Chemistry									
Analyte		Result	RL	Units	DF	Analyzed	By	Method	
Chromium, Trivaler	nt <sup>a</sup>	<del>-984</del> -986	3.7	mg/kg	1	03/15/19 13:08	RI	SW846 6010/7196A M	

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

4.3

4



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 <sup>a</sup>	< 9.8	9.8	mg/kg	3	03/11/19	03/11/19 GT	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	1730	4.9	mg/kg	3	03/11/19	03/11/19 GT	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	404	6.5	mg/kg	1	03/11/19	03/11/19 GT	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Thallium <sup>a</sup>	< 4.9	4.9	mg/kg	3	03/11/19	03/11/19 GT	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Vanadium <sup>a</sup>	778	25	mg/kg	3	03/11/19	03/11/19 GT	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA46280

(2) Prep QC Batch: MP12949

(a) Elevated detection limit due to dilution required for high interfering element.







Client Sample ID: Lab Sample ID: Matrix: Project: General Chemistry	: SW-A20(0.0-0.5) JC84109-4A SO - Soil PPG Site 107, 18 Chapel Avenue, Jersey City, NJ Date Sampled: 03/08/19 Date Received: 03/08/19 Percent Solids: 59.9								
Analyte		Result	RL	Units	DF	Analyzed	By	Method	
Chromium, Trivaler	nt <sup>a</sup>	<del>-1670-</del> 1680	5.6	mg/kg	1	03/15/19 13:08	RI	SW846 6010/7196A M	

Page 1 of 1

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





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 <sup>a</sup>	< 15	15	mg/kg	5	03/11/19	03/11/19 GT	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	3540	7.7	mg/kg	5	03/11/19	03/11/19 gt	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	513	6.1	mg/kg	1	03/11/19	03/11/19 GT	SW846 6010D 1	SW846 3050B <sup>2</sup>
Thallium <sup>a</sup>	< 7.7	7.7	mg/kg	5	03/11/19	03/11/19 GT	SW846 6010D 1	SW846 3050B <sup>2</sup>
Vanadium <sup>a</sup>	884	38	mg/kg	5	03/11/19	03/11/19 GT	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA46280

(2) Prep QC Batch: MP12949

(a) Elevated detection limit due to dilution required for high interfering element.

Page 1 of 1





Client Sample ID: Lab Sample ID: Matrix: Project:	SW-A20(2.0-2.5) JC84109-5A Date Sampled: 03/08/19   SO - Soil Date Received: 03/08/19   PPG Site 107, 18 Chapel Avenue, Jersey City, NJ Percent Solids: 64.4								
General Chemistry									
Analyte		Result	RL	Units	DF	Analyzed	By	Method	
Chromium, Trivaler	nt <sup>a</sup>	<del>-3520-</del> 3400	8.3	mg/kg	1	03/15/19 13:08	RI	SW846 6010/7196A M	

Page 1 of 1

4.5

4

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



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 <sup>a</sup>	< 4.9	4.9	mg/kg	2	03/11/19	03/11/19 GT	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium <sup>a</sup>	815	2.4	mg/kg	2	03/11/19	03/11/19 GT	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	90.6	4.9	mg/kg	1	03/11/19	03/11/19 GT	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Thallium <sup>a</sup>	< 2.4	2.4	mg/kg	2	03/11/19	03/11/19 GT	SW846 6010D 1	SW846 3050B <sup>2</sup>
Vanadium	150	6.1	mg/kg	1	03/11/19	03/11/19 GT	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA46280

(2) Prep QC Batch: MP12949

(a) Elevated detection limit due to dilution required for high interfering element.

Page 1 of 1





Client Sample ID: Lab Sample ID: Matrix: Project:	SW-A19(0.0-0.5) JC84109-6A Date Sampled: 03/08/19   SO - Soil Date Received: 03/08/19   PPG Site 107, 18 Chapel Avenue, Jersey City, NJ Percent Solids: 82.4								
General Chemistry	7								
Analyte		Result	RL	Units	DF	Analyzed	By	Method	
Chromium, Trivaler	nt <sup>a</sup>	<del>- 801</del> 790	2.9	mg/kg	1	03/15/19 13:08	RI	SW846 6010/7196A M	

Page 1 of 1

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

4





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 <sup>a</sup>	< 7.2	7.2	mg/kg	3	03/11/19	03/11/19 GT	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	1740	3.6	mg/kg	3	03/11/19	03/11/19 gt	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	139	4.8	mg/kg	1	03/11/19	03/11/19 GT	SW846 6010D 1	SW846 3050B <sup>2</sup>
Thallium <sup>a</sup>	< 3.6	3.6	mg/kg	3	03/11/19	03/11/19 GT	SW846 6010D 1	SW846 3050B <sup>2</sup>
Vanadium <sup>a</sup>	231	18	mg/kg	3	03/11/19	03/11/19 GT	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA46280

(2) Prep QC Batch: MP12949

(a) Elevated detection limit due to dilution required for high interfering element.

Page 1 of 1





Client Sample ID: Lab Sample ID: Matrix: Project:	SW-A19(2.0-2.5) JC84109-7A Date Sampled: 03/08/19   SO - Soil Date Received: 03/08/19   PPG Site 107, 18 Chapel Avenue, Jersey City, NJ Percent Solids: 81.7									
General Chemistry										
Analyte	Re	esult	RL	Units	DF	Analyzed	By	Method		
Chromium, Trivaler	nt <sup>a</sup> $-16$	<del>70-</del> 1640	6.0	mg/kg	1	03/15/19 13:08	RI	SW846 6010/7196A M		

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







#### SGS LabLink@1045417 08:40 10-Jul-2019

Client Sample ID: Lab Sample ID:	SW-A19(4.0-4.5) JC84109-8A	Date Sampled:	03/08/19
Matrix:	SO - Soil	Date Received:	03/08/19
		<b>Percent Solids:</b>	81.1
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

# **Report of Analysis**

#### **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 <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	53.7	1.2	mg/kg	1	03/11/19	03/11/19 GT	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	13.6	4.8	mg/kg	1	03/11/19	03/11/19 GT	SW846 6010D 1	SW846 3050B <sup>2</sup>
Thallium	< 1.2	1.2	mg/kg	1	03/11/19	03/11/19 GT	SW846 6010D 1	SW846 3050B <sup>2</sup>
Vanadium	20.6	6.0	mg/kg	1	03/11/19	03/11/19 GT	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA46280

(2) Prep QC Batch: MP12949





Client Sample ID: Lab Sample ID: Matrix: Project:	SW-A19(4.0-4.5) JC84109-8A Date Sampled: 03/08/19   SO - Soil Date Received: 03/08/19   PPG Site 107, 18 Chapel Avenue, Jersey City, NJ Percent Solids: 81.1									
General Chemistry	General Chemistry									
Analyte		Result	RL	Units	DF	Analyzed	By	Method		
Chromium, Trivaler	nt <sup>a</sup> –	<del>50.8</del> 49.8	1.7	mg/kg	1	03/15/19 13:08	RI	SW846 6010/7196A M		

Page 1 of 1

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





#### SGS LabLink@1045417 08:40 10-Jul-2019

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
		<b>Percent Solids:</b>	81.6
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

# **Report of Analysis**

#### **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 <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	296	1.3	mg/kg	1	03/11/19	03/11/19 GT	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	36.8	5.1	mg/kg	1	03/11/19	03/11/19 GT	SW846 6010D 1	SW846 3050B <sup>2</sup>
Thallium	< 1.3	1.3	mg/kg	1	03/11/19	03/11/19 GT	SW846 6010D 1	SW846 3050B <sup>2</sup>
Vanadium	58.9	6.3	mg/kg	1	03/11/19	03/11/19 GT	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA46280

(2) Prep QC Batch: MP12949





Client Sample ID: Lab Sample ID: Matrix: Project:	SW-A18(0.0-0.5) JC84109-9A Date Sampled: 03/08/19   JC 84109-9A Date Received: 03/08/19   SO - Soil Date Received: 03/08/19   PPG Site 107, 18 Chapel Avenue, Jersey City, NJ Percent Solids: 81.6									
General Chemistry	7									
Analyte		Result	RL	Units	DF	Analyzed	By	Method		
Chromium, Trivaler	nt <sup>a</sup>	289 285	1.8	mg/kg	1	03/15/19 13:00	RI	SW846 6010/7196A M		

Page 1 of 1

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

4



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 <sup>3</sup>
Chromium	299	1.3	mg/kg	1	03/11/19	03/11/19 GT	SW846 6010D <sup>1</sup>	SW846 3050B <sup>3</sup>
Nickel	31.8	5.2	mg/kg	1	03/11/19	03/11/19 GT	SW846 6010D 1	SW846 3050B <sup>3</sup>
Thallium <sup>a</sup>	< 2.6	2.6	mg/kg	2	03/11/19	03/12/19 ND	SW846 6010D <sup>2</sup>	SW846 3050B <sup>3</sup>
Vanadium	34.3	6.4	mg/kg	1	03/11/19	03/11/19 GT	SW846 6010D 1	SW846 3050B <sup>3</sup>

(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.







Client Sample ID: Lab Sample ID: Matrix: Project:	SW-A18(2.0-2.5) JC84109-10A Date Sampled: 03/08/19   SO - Soil Date Received: 03/08/19   PPG Site 107, 18 Chapel Avenue, Jersey City, NJ Percent Solids: 79.2								
General Chemistry	,								
Analyte		Result		RL	Units	DF	Analyzed	By	Method
Chromium, Trivaler	nt <sup>a</sup>	<del>- 284</del> - 273	3	1.8	mg/kg	1	03/15/19 13:08	RI	SW846 6010/7196A M

Page 1 of 1

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



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 <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	103	1.2	mg/kg	1	03/11/19	03/11/19 GT	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	16.1	4.6	mg/kg	1	03/11/19	03/11/19 GT	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Thallium	< 1.2	1.2	mg/kg	1	03/11/19	03/11/19 GT	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Vanadium	28.3	5.8	mg/kg	1	03/11/19	03/11/19 GT	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA46280

(2) Prep QC Batch: MP12949





Client Sample ID: Lab Sample ID: Matrix: Project:	SW-A18(4.0-4.5) JC84109-11A SO - Soil PPG Site 107, 18 Chapel Avenue, Jersey City, NJ					Date Sampled Date Received Percent Solids	: 03, : 03, : 82	/08/19 /08/19 .9
General Chemistry								
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivaler	nt <sup>a</sup>	<del>-92.4</del> 96.2	1.7	mg/kg	1	03/15/19 13:08	RI	SW846 6010/7196A M

Page 1 of 1

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





**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:

				Sample		Analysis			
SDG	Sample ID	Lab ID	Matrix	Matrix Collection Parent Sample		Cr VI	MET	MISC	
1004400	FB(20190311)	JC84193-1	Water	3/11/2019		х	Х	х	
JC84193	BS-D17A	JC84193-2	Soil	3/11/2019		х	х	x	
1004404	FB(20190311)-A	JC84194-1	Water	3/11/2019		х	х	х	
JC84194	BS-B1	JC84194-2	Soil	3/11/2019		х	х	х	
	FB(20190312)-A	JC84245-1	Water	3/12/2019		х	х	х	
	SW-A30(0.0-0.5)	JC84245-2	Soil	3/12/2019		х	х	х	
	SW-A30(2.0-2.5)	JC84245-3	Soil	3/12/2019		х	х	х	
	SW-A30(4.0-4.5)	JC84245-4	Soil	3/12/2019		х	х	x	
	SW-A30(6.0-6.5)	JC84245-5	Soil	3/12/2019		х	х	x	
100/0/-	SW-A30(8.0-8.5)	JC84245-6	Soil	3/12/2019		Cr VI   MET     X   X     X   X     X   X     X   X     X   X     X   X     X   X     X   X     X   X     X   X     X   X     X   X     X   X     X   X     X   X     X   X     X   X     X   X     X   X     X   X     X   X     X   X     X   X     X   X     X   X     X   X     X   X     X   X     X   X     X   X     X   X     X   X     X   X     X   X     X   X </td <td>х</td> <td>х</td>	х	х	
JC84245	SW-A31(0.0-0.5)	JC84245-7	Soil	3/12/2019		х	Х	х	
	SW-A31(2.0-2.5)	JC84245-8	Soil	3/12/2019		х	Х	х	
	SW-A32(0.0-0.5)	JC84245-9	Soil	3/12/2019		х	х	х	
	SW-A32(2.0-2.5)	JC84245-10	Soil	3/12/2019		х	Х	х	
	SW-A33(0.0-0.5)	JC84245-11	Soil	3/12/2019		Х	Х	х	
	108_CONC-B1	JC84245-14	Soil	3/12/2019		Х	Х	Х	

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.
- <u>SDG #JC84193</u>: 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.

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

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.

#### DATA REVIEW REPORT

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).

#### DATA REVIEW REPORT

## 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

#### DATA REVIEW REPORT

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

%R Percent recovery

RPD Relative percent difference

%D Percent difference

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#### DATA REVIEW REPORT

#### 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.

<u>SDGs #JC84194 and JC84245</u>: 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.

<u>SDG #JC84193</u>: 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
	Hexavalent Chromium, Insoluble	59.3%	< 50%
BS-D1/A	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 <sup>1</sup>
	Non-detect	UJ-
Spike recovery ≥ 50% but < 75%	Detect	J-
	Non-detect	R
Spike recovery < 50%	Detect	R
Spike recovery > 125%	Non-detect	No Action
Spike recovery > 125% but ≤ 150%	Detect	J+
Spike recovery > 150%	Detect	R

Notes:

<sup>1</sup> 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.

<u>SDG #JC84193</u>: 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%.

<u>SDGs #JC84194 and JC84245</u>: The PDS analysis performed on sample locations BS-B1 and SW-A30(0.0-0.5) exhibited recoveries within the control limits.

<u>SDG #JC84193</u>: 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
550	Non-detect	UJ-
PDS recovery < 85%	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  $\pm$  the RL is used.

<u>SDG #JC84193</u>: The laboratory duplicate analysis performed on sample location BS-D17A exhibited results within the control limit.

<u>SDGs #JC84194 and JC84245</u>: 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 RI	> 20%	Non-detect	UJ
		Detect	J
Parent sample and/or laboratory duplicate		Non-detect	UJ
sample result < four times the RL	± RL	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.

HEXAVALENT CHROMIUM: SW-846 7196A		Reported		mance ptable	Not
	No	Yes	No	Yes	Required
Spectrophotometer					
Tier II Validation					
Holding Times		х		Х	
Reporting limits (units)		Х		Х	
Blanks					
A. Instrument Blanks		x		Х	
B. Method Blanks		х		Х	
C. Equipment/Field Blanks		Х		Х	
Laboratory Control Sample (LCS)		Х		Х	
Matrix Spike (MS) %R		х	х		
Matrix Spike Duplicate (MSD) %R	Х				Х
MS/MSD Precision (RPD)	x				Х
Post Digestion Spike %R		Х	Х		
Field/Lab Duplicate (RPD)		Х	х		
Dilution Factor		Х		Х	
Tier III Validation					
Initial calibration %RSD or correlation coefficient		Х		Х	
Continuing calibration %R		Х		Х	
Raw Data		Х		Х	
Transcription/calculation errors present		Х		Х	
Reporting limits adjusted to reflect sample dilutions		Х		Х	
Notes <sup>.</sup>	1	1			

# DATA VALIDATION CHECKLIST FOR HEXAVALENT CHROMIUM

%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		Analysis <sup>,</sup> 6 days	
BS-B1	_		
SW-A30(0.0-0.5)			
SW-A30(2.0-2.5)			
SW-A30(4.0-4.5)		Analysis <sup>.</sup> 7 days	
SW-A30(6.0-6.5)			
SW-A30(8.0-8.5)	SW846 9045D		< 24 hours of receipt by laboratory
SW-A31(0.0-0.5)	_		
SW-A31(2.0-2.5)			
SW-A32(0.0-0.5)			
SW-A32(2.0-2.5)		Analysis: 8 days	
SW-A33(0.0-0.5)			
108_CONC-B1			
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.

	Qualification			
Criteria	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.

<u>SDGs #JC84193 and JC84194</u>: The laboratory duplicate analysis was not performed using a sample from these SDGs.

<u>SDG #JC84245</u>: 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	Reported		Performance Acceptable		Not Required
9045D, ASTM D1498-76	No	Yes	No	Yes	Required
Miscellaneous Instrumentation					
Tier II Validation					
Holding times		x	х		
Reporting limits (units)		x		Х	
Blanks					
A. Instrument Blanks		х		Х	
B. Method blanks		x		Х	
C. Equipment blanks		Х		Х	
Laboratory Control Sample (LCS) %R		Х		X	
Laboratory Control Sample Duplicate (LCSD) %R	Х				Х
LCS/LCSD Precision (RPD)	Х				Х
Matrix Spike (MS) %R	Х				Х
Matrix Spike Duplicate (MSD) %R	Х				Х
MS/MSD Precision (RPD)	Х				Х
Field/Lab Duplicate (RPD)		Х		X	
Dilution Factor		Х		X	
Tier III Validation	<u>.</u>		·		·
Initial calibration %RSD or correlation coefficient	Х				Х
Continuing calibration %R	Х				Х
Raw Data		Х		Х	
Transcription/calculation errors present		x		Х	
Reporting limits adjusted to reflect sample dilutions		x		X	
Notes:					

%R Percent recovery

RPD Relative percent difference

VALIDATION PERFORMED BY: Jennifer Singer

SIGNATURE:

Annifer Alinger

DATE: July 15, 2019

PEER REVIEW: Dennis Capria

DATE: July 18, 2019

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# CHAIN OF CUSTODY CORRECTED SAMPLE ANALYSIS DATA SHEETS



$ \begin{array}{c} \hline Client / Reporting Information \\ \hline critical Reporting Information \\ \hline critical Reporting Information \\ \hline report Address \\ \hline Prove Report \\ \hline Prove Report \\ \hline State \\ $	TEL Projection Names PGS STE 1027 PGS STE 1027 Chape AJEUR Chape AJEUR PGS STE 1027 Chape AJEUR PGS STE 1027 PGS STE 10	24:30 FOUTINE 130, Dayton           24:30 FOUTINE 130, Dayton           7:30:329-2000 FAX: 7           www.sgs.com/dt           Cit Information           Character           Company Name           Street Address           Chy           Absolution           Street Address           Chy           Absolution           Street Address           Chy           Absolution           Street Address           Chy           Absolution           Chy           Absolution           Chy           Absolution           Chy           Absolution           Chy           Absolution           Absolution           Chy           Absolution           Absolution           Chy           Absolution           Chy           Chy           Absolution           Chy           Chy           Chy           Chy           Chy           Chy           Chy           Chy           Chy	Image: state         Number of presented to the state           rent from Report to)         -           state         -           state         -           y of to	x Total Chronien x Total Chronien x Trivator Chronien x Hx Avalut Chronien x X	Requested Analysis	Art C LI O LIS - COG     Matrix Codes     Matrix Codes     W- Drinking Water     WV. Veter     WV. Veter     SV - Surface Water     SV - Surface Water     SV - Surface Water     SI - Sudge     SL
Client / Reporting Information           ampuny Name ;         Prove           A RC N d is         Prove           March 2015         Prove           (U Frield & LANF, Suite JU)         14           10 Frield & LANF, Suite JU         14           10 State         State           10 State         Prove           11 State         Prove           12 State         Prove           13 State         Prove           14 State         Prove           15 State <th>Project Name PG Site 107 PG Site 107 Chape Astevilie Enser (ity NI PO0 770,003 HP00 770,003 HP00 770,003 HP00 770,003 HOLDANG Data Time 3/11/17 1230</th> <th>www.sgc.con/et etcl information Etcl information Elimitic promation (if diffe Company Name Street Address CRy Abention Street Comp Cly Matrix CCC G FB CCC G SD</th> <th>Image: state state</th> <th>KX Trivator Chromium KX Trivator Chromium KX HKXAValunt Chromium</th> <th>Requested Analysis</th> <th>Matrix Codes DV - Drinking Waar GW - Ground Waar GW - Ground Waar St - Standar S - Standar S - Standar S - Standar S - Other Law A - Art B - Field Bank EB - Equipment Bank TB - Trip Blank</th>	Project Name PG Site 107 PG Site 107 Chape Astevilie Enser (ity NI PO0 770,003 HP00 770,003 HP00 770,003 HP00 770,003 HOLDANG Data Time 3/11/17 1230	www.sgc.con/et etcl information Etcl information Elimitic promation (if diffe Company Name Street Address CRy Abention Street Comp Cly Matrix CCC G FB CCC G SD	Image: state	KX Trivator Chromium KX Trivator Chromium KX HKXAValunt Chromium	Requested Analysis	Matrix Codes DV - Drinking Waar GW - Ground Waar GW - Ground Waar St - Standar S - Standar S - Standar S - Standar S - Other Law A - Art B - Field Bank EB - Equipment Bank TB - Trip Blank
amagent Name         Profession           ARCADIS         P           ARCADIS         P           10 Friends         L3NT, Suite 100 / 18           10 Friends         No           10 Friends         ARCAN           10 Friends         ARCAN           10 Friends         ARCAN           10 Friends         ARCAN           No         Ball           10 Friends         ARCAN           10 Fried         D           11 Fried         D	ие Name PPG Site 107 Chape Asteville Enstry City NJ in Drodo 770, 003 ителического в на Пессанда (1), Ja in Decla ush / 1), Ja in Drodo 770, 003 ителического в на Пессанда (1), Ja Jano Tree 3/11/17 1230	E miling information E miling information (d diffe Company Name Street Address City Abantion Surged Cite (d) Surged Ci	Finite of preserved to           Finite of preserved to           State           Number of preserved to           V           V           V           V           V           V           V           V           V           V           V           V           V           V           V           V           V           V           V           V           V           V           V           V           V           V           V           V           V           V           V           V           V           V           V           V           V           V           V           V           V           V           V           V           V           V           V           V  <	K Total Chronium K Total Chronium K Hkravalart Chronium K K Avalart Chronium	X Nickly X Nickly X The llium X Varadium	DW - Dinking Water GW - Ground Water SW - Surface Water SW - Surface Water SU - Sold SE - Sold ED - Oil Liz - Other Light ARI - Air SC - Other Light FB - Field Bank EB - Equiment Bank TB - Tring Blank
There Address         Street         Stree	et Chape Aseu Ensey (ity AT Ensey (ity AT Ensey (ity AT NO 270, 03 House Cher # House Cher #	Billing Information (if diffe Company Name Street Address CRy Addention Bangled One (i) by Crew (c) Matrix CC G FB CC G SO	Starte P of Q 2 2 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	K Trivator Chronium	× Nickl × The live × Vanadion	WW - Weler SV - Surface Water SD - Sol SD - Sol SD - Sol SD - Sol SD - Sol SD - Other Lipid LQ - Other Lipid AR - Air SD - Other Solid WP - Wige FB - Faid Bank EB Rayment Bank PB - Trip Bank
JEWIDUM VA. 18940         Oc           Devictorian         Email         Provember           DATINEW BEIL         IV         Over           Datine State         Provember         Provember           Datine State         Provember         Provember           Datine State         Provember         Provember           Date State         Provember         Provember           State         C + C + T + [];         Transmission           State         Field 10 / Porte of Collection         MECH           Field 10 / Porte of Collection         MECH           BS-D 17A         Provember	Enstry City MJ int Purchase Order # Med Manager Int Michael Children # Med Manager Med Valler 3/11/11 1201 3/11/11 1201	Street Address CRy Adlantion: a Sargied One.(0) by CC G FB CC G SO	State	<pre>monestell monestell m</pre>	× Nickl × The live × Varadium	01-01 LQ - Other Lquid AR - Ar SQL - Other Solid WP - Wige FSI - Field Stark EBS-Supported Back PRS-Synthese Back TB - Trip Black
тор в ПС-ВС 102 11- Сам В 10 - 255 - 7-080 с - Сффе   ; Роск в Роск С - Сффе   ; Ли 100 госк в Роск в Роск в Роск С - Сффе   ; Воск в Роск в Роск Границии (Саменталии) Границии (Саменталии) Грани	ent Purchase Order #	CRy Attention: or Sarred Con (0) Sarred Con (0) Con (C) Matrix CC G FB CC G SO	State Number of preserved II: port 2 2 2 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	$\begin{array}{c c} \hline \\ \hline $	× Antmony × Nicks × Thellium × Varadie	SUL UNIT SOL WP - Wai PB - Faid Bank EB-Raymen Bank RB - Riner Bank TB - Trip Bank LAB USE ONLY
$\begin{array}{c} \begin{array}{c} \begin{array}{c} \begin{array}{c} \begin{array}{c} \end{array} \\ \begin{array}{c} \end{array} \\ \end{array} \\ \begin{array}{c} \end{array} \\ \end{array} \\ \end{array} \\ \end{array} \\ \begin{array}{c} \end{array} \\ \end{array} \\ \end{array} \\ \begin{array}{c} \end{array} \\ \end{array} \\ \end{array} \\ \begin{array}{c} \end{array} \\ \end{array} \\ \begin{array}{c} \end{array} \\ \end{array} \\ \end{array} \\ \begin{array}{c} \end{array} \\ \end{array} \\ \begin{array}{c} \end{array} \\ \end{array} \\ \end{array} \\ \begin{array}{c} \end{array} \\ \end{array} \\ \begin{array}{c} \end{array} \\ \end{array} \\ \end{array} \\ \begin{array}{c} \end{array} \\ \end{array} \\ \begin{array}{c} \end{array} \\ \end{array} \\ \begin{array}{c} \end{array} \\ \end{array} \\ \end{array} \\ \begin{array}{c} \end{array} \\ \end{array} \\ \begin{array}{c} \end{array} \\ \end{array} \\ \end{array} \\ \end{array} \\ \begin{array}{c} \end{array} \\ \end{array} \\ \end{array} \\ \end{array} \\ \begin{array}{c} \end{array} \\ \end{array} $	на панана п П <sup>C</sup> LAMSL/1225 2401 Valle 3/11/19 1230 3/11/19 1230	on Sampled Gase (c) by CC G FB Corp (C) Matrix CC G FB	Number of preserved B           P of Dolles         D         HO         O         O         D         D         D         D         D         D         D         D         D         D         D         D         D         D         D         D         D         D         D         D         D         D         D         D         D         D         D         D         D         D         D         D         D         D         D         D         D         D         D         D         D         D         D         D         D         D         D         D         D         D         D         D         D         D         D         D         D         D         D         D         D         D         D         D         D         D         D         D         D         D         D         D         D         D         D         D         D         D         D         D         D         D         D         D         D         D         D         D         D         D         D         D         D         D         D         D         D         D	$\begin{array}{c c} & & & \\ \hline \\ \hline$	× Nick	RB - Rinse Blank 78 - Trip Blank LAB USE ONLY
500 mm <sup>2</sup> Field ID / Point of Callection MECH F6(20(9 ∪ 3 (1)) BS - 0   7 A	DHOI Viel 8 Date Time 3/11/11 12/1 3/11/19 12.30	Sampled Grab (G) by Cconp (G) Matrix Ccc G FT3 CC G1 SO	# of bottles     D I D I D I     H of P of P of P of P of P of P of P of P		$\mathbf{x} \times \mathbf{x}$	LAB USE ONLY
FB(20190311) BS-DIFA	3/11/11 1201 3/11/19 1230	cc G FB			XXX	
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Relinquished by: Date / Time:	Received By: 3		Relinquished By:	Date /	/ Time: Received By: 4	
Ralinquished by: Date / Time:	Received By: 5		Custody Seal # 1716	Intact Preserved when     Not intact I Absent	Therm. iD:	On jce Cooler Temp. "C

EHSA-QAC-0023-02-FORM-Dayton - Standard COC.xisx

JC84193: Chain of Custody Page 1 of 4



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5.2

сл

JC84193

Chromium, Hexavalent

Redox Potential Vs H2

pH <sup>a</sup>

< 0.010

455

5.20

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

Client Sample ID: Lab Sample ID: Matrix:	FB(20190311) JC84193-1 AQ - Field Blank Soil				Date Sampl Date Receiv	led: 03 ved: 03	/11/19 /11/19	
Project:	PPG Site 107, 18 Cha	pel Avenu	e, Jersey Ci	ty, NJ	Percent Sol	1 <b>ds:</b> n/a	a	
General Chemistry	y							
Analyte	Result	RL	Units	DF	Analyzed	By	Method	

mg/l

mv

su

1

1

1

0.010

# **Report of Analysis**

#### Page 1 of 1

03/11/19 21:33 MO SW846 7196A

ASTM D1498-76

SM4500H+ B-11

03/12/19 21:32 ЕВ

03/11/19 17:30 FR

4.1



<b>Client Sample ID:</b>	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		

# **Report of Analysis**

#### 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

# Page 1 of 1

4.2



-

17A 93-2R Soil				<b>Date Sampled:</b> 03/11/19
93-2R				Date Sampled: 03/11/19
				Date Received: 03/11/19
				Percent Solids: 75.8
Site 107, 18 Cha	pel Avenue	, Jersey Cit	y, NJ	
Result	RL	Units	DF	Analyzed By Method
< 0.53	0.53	mg/kg	1	04/03/19 20:08 joo sw846-3060A/7196A
	ite 107, 18 Cha <b>Result</b> < 0.53	ite 107, 18 Chapel Avenue <b>Result</b> < 0.53 0.53	ResultRLUnits< 0.53	Result       RL       Units       DF         < 0.53



Client Sample ID: Lab Sample ID: Matrix: Project:	BS-D17A JC84193-2RT SO - Soil PPG Site 107, 18 Cha	pel Avenue	, Jersey Cit	ty, NJ	Date Sampled Date Received Percent Solids	: 03 : 03 : 75	5/11/19 5/11/19 5.8	
General Chemistry	7							
Analyte	Result	RL	Units	DF	Analyzed	By	Method	
Iron, Ferrous <sup>a</sup>	1.1 J	0.20	%	1	04/15/19 08:30	MP	ASTM D3872-86	

04/15/19

04/09/19 20:52 јо

# **Report of Analysis**

Page 1 of 1

MP

-SM4500S2- A-11 R

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.

mg/kg

1

(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.

130

NEGATIVE

17200 J

(c) Analysis done out of holding time.

Sulfide Screen b

Total Organic Carbon c



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		

# **Report of Analysis**

#### **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 <sup>1</sup>	SW846 3010A <sup>2</sup>
Chromium	< 10	10	ug/l	1	03/12/19	03/12/19 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>
Nickel	< 10	10	ug/l	1	03/12/19	03/12/19 ND	SW846 6010D 1	SW846 3010A <sup>2</sup>
Thallium	< 10	10	ug/l	1	03/12/19	03/12/19 ND	SW846 6010D 1	SW846 3010A <sup>2</sup>
Vanadium	< 50	50	ug/l	1	03/12/19	03/12/19 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA46288

(2) Prep QC Batch: MP13055







			_		-			
Client Sample ID:	FB(20190	)311)						
Lab Sample ID:	JC84193-	1A				Date Sampled	03	/11/19
Matrix:	AQ - Fiel	d Blank Soil				Date Received	: 03	/11/19
						Percent Solids	<b>:</b> n/a	a
Project:	PPG Site	107, 18 Chap	pel Avenue,	Jersey Cit	ty, NJ			
General Chemistry								I
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivaler	nt <sup>a</sup>	< 0.020	0.020	mg/l	1	03/12/19 16:50	ND	SW846 6010/7196A M

# **Report of Analysis**

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

#### Page 1 of 1

4.1 **4** 





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		

# **Report of Analysis**

**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 <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	80.5	1.3	mg/kg	1	03/12/19	03/12/19 met	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	22.5	5.2	mg/kg	1	03/12/19	03/12/19 met	SW846 6010D 1	SW846 3050B <sup>2</sup>
Thallium	< 1.3	1.3	mg/kg	1	03/12/19	03/12/19 met	SW846 6010D 1	SW846 3050B <sup>2</sup>
Vanadium	57.2	6.5	mg/kg	1	03/12/19	03/12/19 met	SW846 6010D 1	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA46290

(2) Prep QC Batch: MP13027



4.2 **4** 



Client Sample ID: Lab Sample ID:	BS-D17A JC84193-	-2A				Date Sampled	: 03	/11/19
Matrix:	SO - Soil					Date Received	: 03	/11/19
Project:	PPG Site	107, 18 Cha	apel Avenue,	Jersey Cit	y, NJ	Percent Solids	: /5	.8
General Chemistry	,							
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivaler	nt <sup>a</sup>	80.0	1.8	mg/kg	1	03/20/19 17:17	RI	SW846 6010/7196A M

**Report of Analysis** 

Page 1 of 1

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



SGS	50 FB		CH/ sc TEL. 7	AIN 35 Nor 2235 Roi 732-329- w	OF th Am ute 130, 0200 ww.sgs	erica l Dayto FAX: 7	JST( nc D n, NJ 0 32-329-3	2D' aytor 8810 3499/3	<b>Y</b> 1480				FED-EX	Tracking a	•				Botlle Orde SGS Job #	Page	JC 5	of⊥ 19 - 10 8419	2 <u>8</u> 4
Client / Reporting Information			Projec	t Inform	ation											F	leques	ted An	alysis		_	N	atrix Codes
Company Name: ARCLAIS Street Address	Project Name	6 sit	e 10	7 (	Гел	seg.	$C_{i}$	2					-	i line	win							DW GW	- Drinking Water - Ground Water WW - Water
<u>10 FRIENds LINE, Suite100</u> State NEWTOWN, PA 18940	JEPSE	φ. [ Αν. - C. t.	NUE State	Billing Ir Company	Name	in (if diffe	rent from	Report	to)					- der	Chan							sw	SD - Soil SL - Skudge ED-Sediment OI - Oil
MATTHEW BE /	Project # NPOC Client Purchas	0770	,0003	Street Ad City	dress			-	itate		2	ip	Chro	t t	1 L	Ş	.	5	5			LIC SC	2 - Other Liquid AIR - Air OL - Other Solid WP - Wipe B - Field Blank
Sampler(s) Narfe(s) Phone I	Froject Manag	Erught	N. JR.	Attention					Number	of prese	rved Bot	les	Ĩ	Wals	Xuval	44.	cled	بالم	anal			ÉB-I RE T	Equipment Blank B - Rinse Blank 'B - Trip Blank
SGS Serrow # Field ID / Point of Collection	MEOH/DI Vial #	Date	Time	Sampled by	Grab (G) Comp (C)	Matrix	# of bottles	Ŗ	HNO9	H <sub>2</sub> SO <sub>4</sub>	DI Water	ENCORE	4	- 12	Ť	Ý	Z	7	>			4	B USE ONLY
1 FB(20190311) -A 2 BS-BI		3/11/19 3/11/19	1345	<u>сс</u> сс	G 6	FB SO	1			,			X	X	X X	×	X	X	X X				AIG
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10 Business Days	Approved By (S	) 3GS PMI): / Date: 			Comm Comm NJ Re	nercial "A nercial "B iduced (Li	l" (Level 1 I" (Level 2 evel 3)	1) )		elivera ] NYA ] NYA ] MA I	IDIE ASP Ca SP Cat MCP C	egory A egory B iteria			] DOD-	QSM5	*	21 e 1 c	ase 1	omment rUlvr du Us	e Xi	ial Instruction	ng la
3 Business Days" 2 2 Business Days" 1 Business Day" Other					Full Ti   Comm   NJ DH	ier I (Lew nercial "C (QP Com	el 4) ;" mercial "A	a" = Res		CTF Stati EDD	RCP C Forma Forma nercial	riteria 5 t 18‴ = Re	suits + Q0	C Summa	rv.				NITIA Arfi	L AGE VEBI	SSME FICATI	NT <u>3</u> A	
All data available via Lablink * Ap	proval needed fo	or 1-3 Business Sample	Day TAT Custody n	nust be d	ocumen	C ted below	ommercia w each ti	ne sar	Results	+ QC S	posse	+ Partia ssion, in	Raw data	courier	delivery				http	//www.s	is.com/er	n/terms-an	d-conditions
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Relinquished by: Date / Ti Relinquished by: Date / Ti S	ne:	Received By:						4 Custod	y Seal #			0 0	Intact		Preserve	d where a	oplicable		4	Or T	loe	Cooler Tem	p. *C

EHSA-QAC-0023-02-FORM-Dayton - Standard COC.xisx

JC84194: Chain of Custody Page 1 of 3

36



5.2

S

Client Sample ID: Lab Sample ID: Matrix: Project:	FB(20190 JC84194- AQ - Fiel PPG Site	)311)-A 1 d Blank Soil 107, 18 Chaj	pel Avenue,	ty, NJ	Date Sampled Date Received Percent Solids	: 03 : 03 : n/a	/11/19 /11/19 a		
General Chemistry									
Analyte		Result	RL	Units	DF	Analyzed	By	Method	
Chromium, Hexava Redox Potential Vs pH <sup>a</sup>	lent H2	< 0.010 336 4.25 J	0.010	mg/l mv su	1 1 1	03/11/19 21:33 03/12/19 21:25 03/12/19 21:14	MO EB EB	SW846 7196A ASTM D1498-76 SM4500H+ B-11	

# **Report of Analysis**

(a) Field analysis required. Received out of hold time and analyzed by request.







<b>Client Sample ID:</b>	BS-B1		
Lab Sample ID:	JC84194-2	Date Sampled:	03/11/19
Matrix:	SO - Soil	Date Received:	03/11/19
		<b>Percent Solids:</b>	86.3
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

# **Report of Analysis**

#### **General Chemistry**

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent Redox Potential Vs H2	2.7 J 266	0.46	mg/kg mv	1 1	03/20/19 18:15 03/17/19 10:49	RI JOO	SW846 3060A/7196A ASTM D1498-76M
Solids, Percent pH	86.3 7.76 J		% su	1	03/12/19 14:45 03/17/19 08:57	BG JOO	SM2540 G 18TH ED MOD SW846 9045D

# Page 1 of 1

4.2



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
		<b>Percent Solids:</b>	n/a
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

# **Report of Analysis**

#### **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 <sup>1</sup>	SW846 3010A <sup>2</sup>
Chromium	< 10	10	ug/l	1	03/12/19	03/12/19 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>
Nickel	< 10	10	ug/l	1	03/12/19	03/12/19 ND	SW846 6010D 1	SW846 3010A <sup>2</sup>
Thallium	< 10	10	ug/l	1	03/12/19	03/12/19 ND	SW846 6010D 1	SW846 3010A <sup>2</sup>
Vanadium	< 50	50	ug/l	1	03/12/19	03/12/19 ND	SW846 6010D 1	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA46288

(2) Prep QC Batch: MP13055



4



Client Sample ID: Lab Sample ID: Matrix: Project:	FB(20190311)-ADate Sampled:03/11/19JC84194-1ADate Sampled:03/11/19AQ - Field Blank SoilDate Received:03/11/19PPG Site 107, 18 Chapel Avenue, Jersey City, NJn/a								
General Chemistry	,								
Analyte		Result	RL	Units	DF	Analyzed	By	Method	
Chromium, Trivaler	nt <sup>a</sup>	< 0.020	0.020	mg/l	1	03/12/19 16:55	ND	SW846 6010/7196A M	

# **Report of Analysis**

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





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		

# **Report of Analysis**

#### **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 <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	10.1	1.1	mg/kg	1	03/12/19	03/12/19 Met	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	8.5	4.5	mg/kg	1	03/12/19	03/12/19 Met	SW846 6010D 1	SW846 3050B <sup>2</sup>
Thallium	< 1.1	1.1	mg/kg	1	03/12/19	03/12/19 Met	SW846 6010D 1	SW846 3050B <sup>2</sup>
Vanadium	12.3	5.7	mg/kg	1	03/12/19	03/12/19 Met	SW846 6010D 1	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA46290

(2) Prep QC Batch: MP13027



4.2 **4** 



Client Sample ID: Lab Sample ID: Matrix: Project:	BS-B1 JC84194- SO - Soil PPG Site	2A 107. 18 Ch	apel Avenue.	Jersev Cit	v. NJ	Date Sampled Date Received Percent Solids	: 03 : 03 : 86	//11/19 //11/19 5.3	
General Chemistry									
Analyte		Result	RL	Units	DF	Analyzed	By	Method	
Chromium, Trivaler	nt <sup>a</sup>	7.4	1.6	mg/kg	1	03/20/19 18:15	RI	SW846 6010/7196A M	

# **Report of Analysis**

Page 1 of 1

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





TEL 73.33-2402 400         Disc our for a colspan="2"           Colspan="2"         Colspan="2"         Colspan="2"         Colspan="2"         Colspan="2"         Colspan="2"         Colspan="2"         Colspan="2"         Colspan="2"         Colspan="2"         Colspan="2"         Colspan="2"         Colspan="2"         Colspan="2"         Colspan="2"         Colspan="2"         Colspan="2"         Colspan="2"         Colspan="2"         Colspan="2"         Colspan="2"         Colspan="2"         Colspan="2"         Colspan="2"         Colspan="2"         Colspan="2"         Colspan="2"           Colspan="2"          Colspan="2" <th <="" colspan="2" th="" th<=""><th>SGS</th><th>50,50L ( FB</th><th>CHAIN OF CUSTO SGS North America Inc Da 2235 Route 130, Dayton, NJ 08</th><th>DDY ayton <sup>3810</sup></th><th>FED-EX Tracking #</th><th>Page 1 of</th><th>2</th></th>	<th>SGS</th> <th>50,50L ( FB</th> <th>CHAIN OF CUSTO SGS North America Inc Da 2235 Route 130, Dayton, NJ 08</th> <th>DDY ayton <sup>3810</sup></th> <th>FED-EX Tracking #</th> <th>Page 1 of</th> <th>2</th>		SGS	50,50L ( FB	CHAIN OF CUSTO SGS North America Inc Da 2235 Route 130, Dayton, NJ 08	DDY ayton <sup>3810</sup>	FED-EX Tracking #	Page 1 of	2
Check I Reporting Momentation         Project Information         Requested Analysis         Old C D C D C D C D C D C D C D C D C D C		1	TEL. 732-329-0200 FAX: 732-329-3	499/3480	SGS Quote #	SGS Job # TC SII	245		
Company Name         PPP 65 str.e. 104 (Jensety City)         Str.e. 104 (Jensety City) <thstr.e. (jensety="" 104="" city)<="" th="">         Str.e. 10</thstr.e.>	Client / Reporting Information		Project Information		Reque	sted Analysis	Matrix Codes		
Start Space       Image Space	Ancidis	Project Name: PPG STE 10	7 (JERSEY City	)	\$ 6		DW - Drinking Water		
Internet (1990)       Provide (1990)       Prov	10 FILIENDU INNE, SUITE 100	1 10 Chapel AVENU	E Billing Information (if different from I state Company Name	Report to)	him the		WW - Water SW - Surface Water SO - Soit		
Ministriker UScill       VF 000-44-01 (2002)       Car       Bun       Zer       State       State <th< td=""><td>NEWTOWN, PA 18940 Project Contact, Email 1</td><td>Densty City ND Project #</td><td>Street Address</td><td></td><td>24</td><td></td><td>SED-Sediment OI - Oil LIQ - Other Liquid</td></th<>	NEWTOWN, PA 18940 Project Contact, Email 1	Densty City ND Project #	Street Address		24		SED-Sediment OI - Oil LIQ - Other Liquid		
<b>6</b> (10 - 755 - 7080 <b>7</b> (a) <t< td=""><td>MATTHEN 13511</td><td>Client Purchase Order #</td><td>2 City</td><td>State Zro</td><td></td><td>3</td><td>AIR - Air SOL - Other Solid</td></t<>	MATTHEN 13511	Client Purchase Order #	2 City	State Zro		3	AIR - Air SOL - Other Solid		
C. Cife[]/i       Tim M: Lawph, Ju Ju       Tim M: Lawph, Ju Ju       Tim M: Lawph, Ju Ju         umma       Difference       Under the memory of the me	610-755-7080 Sampler(s) Name(s) Phone	# Project Manager , )	Attention:		1 2 2 2	W I I I	WP - Wipe FB - Field Blank EB-Equipment Blank		
Total D / Point of Collection       Understand       Total D / Point of Collection       Understand       Total D / Point of Collection       Use of the second barries       Total D / Point of Collection       Lab USE ONLY         ( FB (20190312.) - A       3/2/13       3/2/13       3/2/13       3/2/13       3/2/13       3/2/13       3/2/13       3/2/13       3/2/13       3/2/13       3/2/13       3/2/13       3/2/13       3/2/13       3/2/13       3/2/13       3/2/13       3/2/13       3/2/13       3/2/13       3/2/13       3/2/13       3/2/13       3/2/13       3/2/13       3/2/13       3/2/13       3/2/13       3/2/13       3/2/13       3/2/13       3/2/13       3/2/13       3/2/13       3/2/13       3/2/13       3/2/13       3/2/13       3/2/13       3/2/13       3/2/13       3/2/13       3/2/13       3/2/13       3/2/13       3/2/13       3/2/13       3/2/13       3/2/13       3/2/13       3/2/13       3/2/13       3/2/13       3/2/13       3/2/13       3/2/13       3/2/13       3/2/13       3/2/13       3/2/13       3/2/13       3/2/13       3/2/13       3/2/13       3/2/13       3/2/13       3/2/13       3/2/13       3/2/13       3/2/13       3/2/13       3/2/13       3/2/13       3/2/13       3/2/13       3/2/13 <td>C. Cifelli</td> <td>Jim McLaughli</td> <td>1, Ja</td> <td></td> <td>5 3</td> <td></td> <td>RB - Rinse Blank TB - Trip Blank</td>	C. Cifelli	Jim McLaughli	1, Ja		5 3		RB - Rinse Blank TB - Trip Blank		
<sup>600</sup> / <sub>1</sub> Paid D / Point of Callection <sup>600</sup> / <sub>1</sub>			aflection	Number of preserved Bottles	シミキさい	an a			
L       FB (20190312) - A       3/2/17       0800       C       G       F6       2       1       1       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X	sos Semple # Field ID / Point of Collection	MEOH/D/ Vial # Date	fime Sampled Grab (G) Matrix # of bottles	HCI NaOH H;SO, H;SO, NONE DI Wat MEOH ENCOF	THEAS	2 >	LAB USE ONLY		
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	( FB(20190312) -A	3/12/19 0	300 CC G FB 2		XXXXX	XX			
3       SW - A30(2:0 - 2.5')       21/21/1       0450 CC       G       33       1       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X	2 SW- A30(0.0-0.5)	3/12/19 01	145 C 6 50 1	1	XXXXX	XX	65		
Y       SU-A30(40 - 4, 5)       S1/2/11 015 CC G 30 1       I       I       X X X X X X X X X A A A G         S       SW-A30(6,0 - 6, 5)       S1/2/11 1000 CC G 90 1       I       I       X X X X X X X X A A A A G         G       SW-A30(6,0 - 6, 5)       S1/2/11 1000 CC G 90 1       I       I       X X X X X X X X A A A A A A A A A A A A	3 SW-A30(2.0-2.5)	3/12/19 00	50 0 G B 1		XXXXX	XX			
S       S       S       S       S       S       S       S       S       S       S       S       S       S       S       S       S       S       S       S       S       S       S       S       S       S       S       S       S       S       S       S       S       S       S       S       S       S       S       S       S       S       S       S       S       S       S       S       S       S       S       S       S       S       S       S       S       S       S       S       S       S       S       S       S       S       S       S       S       S       S       S       S       S       S       S       S       S       S       S       S       S       S       S       S       S       S       S       S       S       S       S       S       S       S       S       S       S       S       S       S       S       S       S       S       S       S       S       S       S       S       S       S       S       S       S       S       S       S	4 SW-A30(40 -45)	3/12/19 0	155 CC G 20 1	i   i   i   i	XXXXX	XX	A19		
G       SW - A30 (B, 0, -0, 5)       T12 / 15 (005 (C, G, S)       1       1       X X X X X X X X X X X X X X X X X X X	5 (W-A3D(6.0-6.5)	11/2/11/10	00 6 6 0 1		YXXXX	XX	BID		
7       (W - A31 (g. 0 - 0.5)       3] 12 [15   10 20 CC (g 0 1       1       X X X X X X X X X X X X X X X X X X X	6 (W-A30180-85)	7/12/15 10	OS CC G B I		YXXXX	XX	100		
Structure	7 (W- A3 (a. 1 - 0 5)	31,2/19 10	20 0 6 08 1		V X X Y X	XX			
G       W       A 32 (2.0 - 2.5)       3/12/11       1/235       CC       G       S0       1       1       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X <td< td=""><td>S Q1-130 (21-25)</td><td>310/15 10</td><td>25 6 6 60 1</td><td></td><td>XXXXX</td><td>XX</td><td></td></td<>	S Q1-130 (21-25)	310/15 10	25 6 6 60 1		XXXXX	XX			
10       Six - A32(20 - 2.5)       Six - A32(20 - 2.5)       Six - A32(20 - 2.5)         11       11       11       11       11       11       11       11       11       11       11       11       11       11       11       11       11       11       11       11       11       11       11       11       11       11       11       11       11       11       11       11       11       11       11       11       11       11       11       11       11       11       11       11       11       11       11       11       11       11       11       11       11       11       11       11       11       11       11       11       11       11       11       11       11       11       11       11       11       11       11       11       11       11       11       11       11       11       11       11       11       11       11       11       11       11       11       11       11       11       11       11       11       11       11       11       11       11       11       11       11       11       11       11       1	9 Ch(-A20(0,0-0,5)	31.2/19 10	25 6 6 6 1		YXXXX	X X			
IN       -A33 (0, 0 - U, S)       g/1/2 / 1       I/Q C       G       Q I       I       I/Q I       A X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X <td>(0, 5) = A(2)(2, 0, -2, 5)</td> <td></td> <td>40 6 6 50 1</td> <td></td> <td>V X X X X</td> <td></td> <td></td>	(0, 5) = A(2)(2, 0, -2, 5)		40 6 6 50 1		V X X X X				
Int       JW	11 (11- 423(0.0-0.5)	2/12/19 10			YX XXX				
Tom Around Time (Business Days)       Splic (1       Deliverable       Comments / Special Instructions         10       Business Days       Agenerad by (BS ME; / See:       Commercial "A" (Level 1)       NYASP Category A       DOO-QSMS         10       Business Days       Business Days       Business Days       Business Days       Deliverable       DOO-QSMS         10       Business Days       Business Days       Business Days       Business Days       Deliverable       DOO-QSMS         11       Business Days       Bus	11 107 M032 N	2/12/19/18	10 CG S VO I		X X X X X	V X	+		
Approved by (805 PR): / Drive:       Commercial '''': Level 1)       IV XASP Category A       DOD-Q345         B 10 Business Days       Commercial 'B'': Level 1)       IV XASP Category B       Dodo-Q345         B Statisess Days       Commercial 'B'': Level 1)       IV XASP Category B       Dodo-Q345         B Statisess Days       Commercial 'B'': Level 1)       IV XASP Category B       Dodo-Q345         B Statisess Days       Commercial 'B'': Level 1)       IV XASP Category B       Dodo-Q345         B Statisess Days'       Commercial 'B'': Results of Claris       Dodo-Q345         B Statisess Days'       Commercial 'C'': Results of Claris       Dodo-Q345         B Statisess Days'       Commercial 'C'': Results of Claris       Dodo-Q345         B Statisess Days'       Commercial 'C'': Results of Claris       Dodo-Q345         B Statisess Days'       Commercial 'C'': Results of Claris       Dodo-Q345         B Statisess Days'       Commercial 'C'': Results of Claris       Dodo-Q345         B Statises Days'       Commercial 'C'': Results of Claris       Dodo-Q345         B Statises Days'       Commercial 'C'': Results of Claris       Dodo-Q345         B Statises Days'       Commercial 'C'': Results of Claris       Dodo-Q345         B Statises Days'       Sample Clavodar must be documented below acchiline samples charge possese	Turn Around Time (B	Business Days)		Deliverable		Comments / Special In	structions		
		Approved By (SGS PM): / Date:	Commercial "A" (Level 1)	NYASP Category A	DOD-QSM5				
S Statises Days     Statise Statises     Statises Days     Statises     Statises Days     Statises     Statis     Statises     Statises     Statises	10 Business Days		Commercial "B" (Level 2)	NYASP Category B					
	5 Business Days		NJ Reduced (Lovel 3)	MA MCP Criteria	-				
Buttypelands by     Buttypelands     Butty	2 Business Days		Commercial "C"	State Forms					
Other     Commercial "&" Results on; Commercial "B" Results on; Results on; Commercial "B" Results on; Commercial "B" Results on;	1 Business Day*		NJ DKQP	EDD Format EOL	AL.				
A data avelance via Lutorix     Approver meases of 13 glasses 02 yr 141     Commercial The "Resting of the data"     1     http://www.sas.com/ent/erms-and-conditions       Relinguished by:     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0 <td< td=""><td>Other</td><td></td><td>Commercial "A"</td><td>" = Results only; Commercial "B" = Res</td><td>uits + QC Summary</td><td></td><td></td></td<>	Other		Commercial "A"	" = Results only; Commercial "B" = Res	uits + QC Summary				
Relinguisments by:     Open Time:     Description By:     Open Time:     Description By:       1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1	All data available via Lablink Ap	Sample Cus	tody must be documented below each tin	ne samples change possession, in	cluding courier delivery.	http://www.sgs.com/en/ter	ms-and-conditions		
Relinquished by:         Date / Time:         Received By:         Date / Time:         Received By:           3         3         4         /////         ////////////////////////////////////	Relinquished by: 1 Colli 3/12	19 1420 Reported By	charles	2 holdentelver	Isers 3-12-19	CHS Received By:	· · ·		
Relinquished by: Date / Time: Received By: Custody Seal # 1/0/1/L U Matt Preserved where applicable On Les Cooler Temo. *C	Relinquished by: Date / T	lime: Received By:		Relinquished By: 4	Date / Time:	Received By:			
5 11019 Not intact   Accent   Them. D: DK F. [-3,100	Relinquished by: Date / T	ime: Received By: 5		Custody Seal # 11014	Intact Preserved where applicable Not intact Absent		3.1°C		

INITIAL ASESSMENT

EHSA-QAC-0023-02-FORM-Dayton - Standard COC.xisx

JC84245: Chain of Custody Page 1 of 3



E CE

5.2

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23 of 83 JC84245

SGS	CHAI SG 2235 TEL. 73	N OF CUST( S North America Inc Dayto Route 130, Dayton, NJ 088 2-329-0200 FAX 732-329 www.sgs.com/ehsusa	DDY n 10 -3499	FED-EX Tracking # SGS Quote #	PAGE 2_ OF 2_ ************************************
Company Name GrCA dis Street Addess (1), Forends (one Sinte 200	Project Name: PPA Site 107 Street 18 Church Atre	S-15cy C	t from Report to)		TEST CODE sheet) Matrix Code: DW - Drinking Wz GW - Ground Wz WW - Water SW - Suface Wz SO - Sol
City State Zp NotoHown, PA 18440 Protectorical Phone A Rell Faxe From A TT 2080 Faxe	City State Jersey City NJ Protect # N\$000 770,000 3 Client Purchase Order #	Company Name Street Address	State Zip	homium Lant Chros	SL-Sludge SED-Sedmen UI-0-0ther Liqu LIQ-0ther Liqu SCL-0ther So WP-Wbp- ER-Ereak Blant
Sample Name(s) Phone #	Project Manager 5 Im <u>McLaughlin</u> Collection MEOH/DI Vial # Date Time	Attention:	Number of preserved bottles	Hexer Color	Benegument B     Re. Rinne Blan     Re. Rinne Blan     Re. Rinne Blan     Re. Rinne Blan     S     S     S     S     LAB USE ON     LAB USE ON
FB(20190312)         C           13/         BS-AIC           14         108- CONC - AI	3/12/19 08:10 3/12/19 1345 3/12/19 1400	$\begin{array}{c c} \hline C & FR & Z \\ \hline C & SO & I \\ \hline C & O & I \\ \hline \end{array}$		x         x         x         x         x         x         x         x         x         x         x         x         x         x         x         x         x         x         x         x         x         x         x         x         x         x         x         x         x         x         x         x         x         x         x         x         x         x         x         x         x         x         x         x         x         x         x         x         x         x         x         x         x         x         x         x         x         x         x         x         x         x         x         x         x         x         x         x         x         x         x         x         x         x         x         x         x         x         x         x         x         x         x         x         x         x         x         x         x         x         x         x         x         x         x         x         x         x         x         x         x         x         x         x         x         x         x	
Turnamond Time (Business days)		Date			
Std.:         10 Business Days           S Day RUSH         3 Day RUSH           3 Day RUSH         1 Day RUSH           1 Day RUSH         1 Day RUSH	Approved by (SGS Project Manager/Date:	Commercial "A" (Le Commercial "B" (Le FULLT1 (Level 3+4) NJ Reduced Commercial "C" NJ Data of Known	NYASP Cate NYASP Cate State Forms X EDD Format Other	рогу А јогу В 	
emergency & Rush T/A deta available via LabLink.  Refingulated by Sampler: Refingulated by Sampler:  Refingulated by Sampler:  Data Time:  Data Time:	Sample Custody must be doc 1920 Receiping By: 1 Dobertels Received By: 3	Commercial "A" = Results Only; NJ Reduced = Results + QC Su umented below each time sar	Commercial "B" = Results + QC Su mmary + Parial Rew data nples change possession, inclu Reimfunded By: 2 Concertation Relinquished By:	Inmary Sample inventory is to ding courier delivery. Culsels Date Time: Date Time:	Received By:
Relinquished by: Date Time: 5	Received By: 5		Custody Seal # // 0/4	Intact Preserved where applicable Not intact	On ice Cooler Temp. d.C.

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

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

JC84245: Chain of Custody Page 2 of 3



5.2

G

Chromium, Hexavalent

Redox Potential Vs H2

pH <sup>a</sup>

Client Sample ID: Lab Sample ID: Matrix:	FB(20190312)-A JC84245-1 AQ - Field Blank Soi	l			Date Samp Date Receiv	led: 03	/12/19 /12/19	
Project:	PPG Site 107, 18 Cha	apel Avenue	e, Jersey Ci	ty, NJ	Percent Sol	ids: n/a	a	
General Chemistry	7							
Analyte	Result	RL	Units	DF	Analyzed	Bv	Method	

mg/l

mv

su

1

1

1

0.010

# **Report of Analysis**

Page 1 of 1

ASTM D1498-76

SM4500H+ B-11

03/12/19 20:30 JOO SW846 7196A

03/18/19 00:12 ев

03/12/19 17:30 AS

4.1

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

< 0.010

619

4.60



Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		
<b>D</b> • 4		Percent Solids:	91.2
Matrix:	SO - Soil	Date Received:	03/12/19
Client Sample ID: Lab Sample ID:	SW-A30(0.0-0.5) JC84245-2	Date Sampled:	03/12/19

# **Report of Analysis**

#### **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

# Page 1 of 1

4.2



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
		<b>Percent Solids:</b>	85.8
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

# **Report of Analysis**

#### **General Chemistry**

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent Redox Potential Vs H2	18.5 J 269	0.47	mg/kg my	1	03/20/19 18:29	JOO FB	SW846 3060A/7196A 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

# Page 1 of 1

4.3



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		
			]

# **Report of Analysis**

# **General Chemistry**

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent Redox Potential Vs H2	< 0.53 UJ	0.53	mg/kg	1	03/20/19 18:29	JOO EB	SW846 3060A/7196A
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

# Page 1 of 1

4.4



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		

# **Report of Analysis**

# **General Chemistry**

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	< 0.50 <b>UJ</b>	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

# Page 1 of 1



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
		<b>Percent Solids:</b>	74.4
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

# **Report of Analysis**

# **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

# Page 1 of 1

4.6



Client Sample ID:	SW-A31(0.0-0.5)		
Lab Sample ID:	JC84245-7	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		
~ ~ ~ ~ .			

# **Report of Analysis**

#### **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

# Page 1 of 1

4.7

Client Sample ID:	SW-A31(2.0-2.5)		
Lab Sample ID:	JC84245-8	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		

# **Report of Analysis**

#### **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

# Page 1 of 1

4.8


Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	Percent Solius:	80.5	
Matrix:	SO - Soil	Date Received:	03/12/19	
Client Sample ID: Lab Sample ID:	SW-A32(0.0-0.5) JC84245-9	Date Sampled:	03/12/19	

# **Report of Analysis**

### **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

### Page 1 of 1

4.9



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		

# **Report of Analysis**

#### **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

### Page 1 of 1

4.10 4



Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		
		Percent Solids:	78.2
Matrix:	SO - Soil	Date Received:	03/12/19
Lab Sample ID:	JC84245-11	Date Sampled:	03/12/19
Client Sample ID:	SW-A33(0.0-0.5)		

# **Report of Analysis**

### 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

### Page 1 of 1

4.11 **4** 



Client Sample ID:	108_CONC-B1		
Lab Sample ID:	JC84245-14	Date Sampled:	03/12/19
Matrix:	SO - Soil	Date Received:	03/12/19
		<b>Percent Solids:</b>	91.4
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		
General Chemistry			

#### 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

### Page 1 of 1

4.12



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		

# **Report of Analysis**

### **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 <sup>1</sup>	SW846 3010A <sup>2</sup>
Chromium	< 10	10	ug/l	1	03/13/19	03/13/19 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>
Nickel	< 10	10	ug/l	1	03/13/19	03/13/19 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>
Thallium	< 10	10	ug/l	1	03/13/19	03/13/19 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>
Vanadium	< 50	50	ug/l	1	03/13/19	03/13/19 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA46296

(2) Prep QC Batch: MP13077



4



Client Sample ID: Lab Sample ID: Matrix: Project:	FB(20190 JC84245- AQ - Fiel PPG Site	)312)-A 1A d Blank Soil 107, 18 Chap	pel Avenue,	Jersey Cit	y, NJ	Date Sampled Date Received Percent Solids	: 03, : 03, : n/a	/12/19 /12/19 a
General Chemistry	•							
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivaler	nt <sup>a</sup>	< 0.020	0.020	mg/l	1	03/13/19 14:48	ND	SW846 6010/7196A M

# **Report of Analysis**

Page 1 of 1

4.1

4

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





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		

**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 <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	82.5	1.1	mg/kg	1	03/13/19	03/13/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>
Nickel	23.7	4.2	mg/kg	1	03/13/19	03/13/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>
Thallium <sup>a</sup>	< 2.1	2.1	mg/kg	2	03/13/19	03/13/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>
Vanadium	39.5	5.3	mg/kg	1	03/13/19	03/13/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA46296

(2) Prep QC Batch: MP13076

(a) Elevated detection limit due to dilution required for high interfering element.

Page 1 of 1





Client Sample ID: Lab Sample ID: Matrix: Project: General Chemistry	SW-A30(0.0-0.5) JC84245-2A SO - Soil PPG Site 107, 18 Chapel Avenue, Jersey City, NJ					Date Sampled:03/12/19Date Received:03/12/19Percent Solids:91.2		
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivaler	nt <sup>a</sup>	79.4	1.5	mg/kg	1	03/20/19 18:25	JOO	SW846 6010/7196A M

Page 1 of 1

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

4.2



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		

# **Report of Analysis**

#### **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 <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	233	1.1	mg/kg	1	03/13/19	03/13/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	28.7	4.5	mg/kg	1	03/13/19	03/13/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Thallium	< 1.1	1.1	mg/kg	1	03/13/19	03/13/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Vanadium	54.5	5.6	mg/kg	1	03/13/19	03/13/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA46296

(2) Prep QC Batch: MP13076



4.3 **4** 



Client Sample ID: Lab Sample ID: Matrix: Project:	SW-A30( JC84245- SO - Soil PPG Site	SW-A30(2.0-2.5) JC84245-3A Date Sampled: 03 SO - Soil Date Received: 03 Percent Solids: 83 PPG Site 107, 18 Chapel Avenue, Jersey City, NJ							
General Chemistry	7								
Analyte		Result	RL	Units	DF	Analyzed	By	Method	
Chromium, Trivaler	nt <sup>a</sup>	215	1.6	mg/kg	1	03/20/19 18:29	JOO	SW846 6010/7196A M	

Page 1 of 1

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



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		

# **Report of Analysis**

#### **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 <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	11.4	1.3	mg/kg	1	03/13/19	03/13/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	12.4	5.2	mg/kg	1	03/13/19	03/13/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Thallium	< 1.3	1.3	mg/kg	1	03/13/19	03/13/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Vanadium	16.6	6.5	mg/kg	1	03/13/19	03/13/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA46296

(2) Prep QC Batch: MP13076



4.4 **4** 



Client Sample ID: Lab Sample ID: Matrix: Project: General Chemistry	SW-A30(4.0-4.5) JC84245-4A SO - Soil PPG Site 107, 18 Chapel Avenue, Jersey City, NJ					Date Sampled:03/12/19Date Received:03/12/19Percent Solids:75.3		
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivaler	nt <sup>a</sup>	11.4	1.8	mg/kg	1	03/20/19 18:29	JOO	SW846 6010/7196A M

Page 1 of 1

4.4

4

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





Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	Percent Solids:	80.3
Matrix:	SO - Soil	Date Received:	03/12/19
Lab Sample ID:	JC84245-5A	Date Sampled:	03/12/19
Client Sample ID:	SW-A30(6.0-6.5)		

# **Report of Analysis**

#### **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 <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	13.9	1.2	mg/kg	1	03/13/19	03/14/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	11.7	4.9	mg/kg	1	03/13/19	03/14/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Thallium	< 1.2	1.2	mg/kg	1	03/13/19	03/14/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Vanadium	21.1	6.1	mg/kg	1	03/13/19	03/14/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA46296

(2) Prep QC Batch: MP13076



4.5 **4** 





Client Sample ID: Lab Sample ID: Matrix: Project:	SW-A30( JC84245- SO - Soil PPG Site	SW-A30(6.0-6.5) JC84245-5A Date Sampled: 03/12/19   SO - Soil Date Received: 03/12/19   PPG Site 107, 18 Chapel Avenue, Jersey City, NJ Percent Solids: 80.3							
General Chemistry									
Analyte		Result	RL	Units	DF	Analyzed	By	Method	
Chromium, Trivaler	nt <sup>a</sup>	13.9	1.7	mg/kg	1	03/20/19 18:29	JOO	SW846 6010/7196A M	

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

4.5



Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		
		Percent Solids:	74.4
Matrix:	SO - Soil	Date Received:	03/12/19
Lab Sample ID:	JC84245-6A	Date Sampled:	03/12/19
Client Sample ID:	SW-A30(8.0-8.5)		

# **Report of Analysis**

#### **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 <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	12.2	1.3	mg/kg	1	03/13/19	03/13/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	11.7	5.3	mg/kg	1	03/13/19	03/13/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Thallium	< 1.3	1.3	mg/kg	1	03/13/19	03/13/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Vanadium	17.5	6.7	mg/kg	1	03/13/19	03/13/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA46296

(2) Prep QC Batch: MP13076



4.6 **4** 



Client Sample ID: Lab Sample ID: Matrix: Project:	SW-A30( JC84245- SO - Soil PPG Site	8.0-8.5) 6A 107, 18 Cha	Date Sampled Date Received Percent Solids	: 03/ : 03/ : 74	/12/19 /12/19 .4			
General Chemistry								
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivaler	nt <sup>a</sup>	12.2	1.8	mg/kg	1	03/20/19 18:29	JOO	SW846 6010/7196A M

Page 1 of 1

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





Lab Sample ID: Matrix:	JC84245-7A SO - Soil	Date Sampled:	03/12/19
	50 - 501	Percent Solids:	79.0
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

# **Report of Analysis**

#### **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 <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	51.0	1.2	mg/kg	1	03/13/19	03/13/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	29.3	4.8	mg/kg	1	03/13/19	03/13/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Thallium	< 1.2	1.2	mg/kg	1	03/13/19	03/13/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Vanadium	39.3	6.0	mg/kg	1	03/13/19	03/13/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA46296

(2) Prep QC Batch: MP13076



4.7 4



Client Sample ID: Lab Sample ID: Matrix: Project:	SW-A31( JC84245- SO - Soil PPG Site	SW-A31(0.0-0.5)   JC84245-7A   SO - Soil   Date Sampled: 03/12/19   Date Received: 03/12/19   PPG Site 107, 18 Chapel Avenue, Jersey City, NJ							
General Chemistry	General Chemistry								
Analyte		Result	RL	Units	DF	Analyzed	By	Method	
Chromium, Trivaler	nt <sup>a</sup>	47.7	1.7	mg/kg	1	03/20/19 18:29	JOO	SW846 6010/7196A M	

Page 1 of 1

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





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
		<b>Percent Solids:</b>	77.6
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

# **Report of Analysis**

#### **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 <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	86.9	1.3	mg/kg	1	03/13/19	03/13/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	23.9	5.1	mg/kg	1	03/13/19	03/13/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Thallium	< 1.3	1.3	mg/kg	1	03/13/19	03/13/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Vanadium	38.4	6.3	mg/kg	1	03/13/19	03/13/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA46296

(2) Prep QC Batch: MP13076



4.8 **4** 



Client Sample ID: Lab Sample ID: Matrix: Project:	SW-A31( JC84245- SO - Soil PPG Site	SW-A31(2.0-2.5) Date Sampled: 03/12/19   IC84245-8A Date Sampled: 03/12/19   SO - Soil Date Received: 03/12/19   PPG Site 107, 18 Chapel Avenue, Jersey City, NJ Precent Solids: 77.6							
General Chemistry									
Analyte		Result	RL	Units	DF	Analyzed	By	Method	
Chromium, Trivaler	nt <sup>a</sup>	83.7	1.8	mg/kg	1	03/20/19 18:29	JOO	SW846 6010/7196A M	

Page 1 of 1

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





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
		<b>Percent Solids:</b>	80.3
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

# **Report of Analysis**

#### **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 <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	23.0	1.2	mg/kg	1	03/13/19	03/13/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	17.2	4.9	mg/kg	1	03/13/19	03/13/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Thallium	< 1.2	1.2	mg/kg	1	03/13/19	03/13/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Vanadium	45.1	6.1	mg/kg	1	03/13/19	03/13/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA46296

(2) Prep QC Batch: MP13076



4.9 4



Client Sample ID: Lab Sample ID: Matrix: Project:	SW-A32( JC84245- SO - Soil PPG Site	SW-A32(0.0-0.5) IC84245-9A Date Sampled: 03/12/19   SO - Soil Date Received: 03/12/19   PPG Site 107, 18 Chapel Avenue, Jersey City, NJ Precent Solids: 80.3								
General Chemistry	General Chemistry									
Analyte		Result	RL	Units	DF	Analyzed	By	Method		
Chromium, Trivaler	nt <sup>a</sup>	23.0	1.7	mg/kg	1	03/20/19 18:29	JOO	SW846 6010/7196A M		

Page 1 of 1

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







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 <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	29.2	1.2	mg/kg	1	03/13/19	03/13/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>
Nickel	18.2	4.6	mg/kg	1	03/13/19	03/13/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>
Thallium <sup>a</sup>	< 2.3	2.3	mg/kg	2	03/13/19	03/14/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>
Vanadium	28.7	5.8	mg/kg	1	03/13/19	03/13/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA46296

(2) Prep QC Batch: MP13076

(a) Elevated detection limit due to dilution required for high interfering element.

Page 1 of 1





Client Sample ID: Lab Sample ID: Matrix: Project:	SW-A32(2.0-2.5) JC84245-10A Date Sampled: 03/12/19   SO - Soil Date Received: 03/12/19   PPG Site 107, 18 Chapel Avenue, Jersey City, NJ Percent Solids: 82.5							/12/19 /12/19 .5
General Chemistry								
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivaler	nt <sup>a</sup>	27.9	1.7	mg/kg	1	03/20/19 18:29	JOO	SW846 6010/7196A M

Page 1 of 1

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



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 <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	21.3	1.2	mg/kg	1	03/13/19	03/13/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	16.0	5.0	mg/kg	1	03/13/19	03/13/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>
Thallium	< 1.2	1.2	mg/kg	1	03/13/19	03/13/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>
Vanadium	41.2	6.2	mg/kg	1	03/13/19	03/13/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA46296

(2) Prep QC Batch: MP13076





Client Sample ID: Lab Sample ID: Matrix: Project:	SW-A33(0.0-0.5) JC84245-11A Date Sampled: 03/12/19   SO - Soil Date Received: 03/12/19   PPG Site 107, 18 Chapel Avenue, Jersey City, NJ Precent Solids: 78.2							/12/19 /12/19 .2
General Chemistry								
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivaler	nt <sup>a</sup>	21.3	1.7	mg/kg	1	03/20/19 18:29	JOO	SW846 6010/7196A M

Page 1 of 1

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





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 <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	81.6	1.1	mg/kg	1	03/13/19	03/13/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	17.5	4.3	mg/kg	1	03/13/19	03/13/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>
Thallium <sup>a</sup>	< 3.2	3.2	mg/kg	3	03/13/19	03/13/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>
Vanadium	30.3	5.4	mg/kg	1	03/13/19	03/13/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA46296

(2) Prep QC Batch: MP13076

(a) Elevated detection limit due to dilution required for high interfering element.

Page 1 of 1





Client Sample ID: Lab Sample ID: Matrix: Project:	108_CONC-B1 JC84245-14A Date Sampled: 03/12/19   JC8 4245-14A Date Received: 03/12/19   SO - Soil Date Received: 03/12/19   PPG Site 107, 18 Chapel Avenue, Jersey City, NJ 91.4							/12/19 /12/19 .4
General Chemistry								
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivaler	nt <sup>a</sup>	69.3	1.5	mg/kg	1	03/20/19 18:29	JOO	SW846 6010/7196A M

Page 1 of 1

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









**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:

			Matrix	Sample		Analysis		
SDG	Sample ID	Lab ID	Matrix	Collection Date	Parent Sample	Cr VI	MET	MISC
1004044	FB(20190313)-A	JC84311-1	Water	3/13/2019		х	Х	х
JC84311	BS-B0	JC84311-2	Soil	3/13/2019		x	х	х
1004444	FB(20190314)-A	JC84441-1	Water	3/14/2019		x	Х	х
JC84441	BS-BO-2	JC84441-2	Soil	3/14/2019		х	Х	х
1004440	FB(20190314)	JC84442-1	Water	3/14/2019		х	Х	х
JC84442	BS-F18	JC84442-2	Soil	3/14/2019		х	Х	х
1004500	FB(20190315)	JC84506-1	Water	3/15/2019		х	Х	х
JC84506	BS-F17	JC84506-2	Soil	3/15/2019		x	Х	х
	FB(20190315)-A	JC84519-1	Water	3/15/2019		х	Х	х
	SW-A8(2.0-2.5)	JC84519-2	Soil	3/15/2019		х	Х	х
	SW-A8(4.0-4.5)	JC84519-3	Soil	3/15/2019		x	Х	х
	SW-A8(6.0-6.5)	JC84519-4	Soil	3/15/2019		x	Х	х
	108_M018W2	JC84519-5	Soil	3/15/2019		x	Х	х
JC84519	108_M018W1	JC84519-6	Soil	3/15/2019		x	Х	х
	SW-A7(0.0-0.5)	JC84519-7	Soil	3/15/2019		x	х	x
	SW-A7(2.0-2.5)	JC84519-8	Soil	3/15/2019		х	х	х
	SW-A7(4.0-4.5)	JC84519-9	Soil	3/15/2019		х	Х	х
	DUP-04(20190315)RR	JC84519-10	Soil	3/15/2019	SW-A8(6.0-6.5)	Х	Х	х
	108_M018_E	JC84519-11	Soil	3/15/2019		X	х	х

#### 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.

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

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.

#### DATA REVIEW REPORT

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
	Water	180 days from collection to analysis	Preserved to a pH of less than 2; Cool to <6°C
SW-846 6010C	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).

#### DATA REVIEW REPORT

### 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.

<u>SDG #JC84519</u>: 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	Sample Location Analyte		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

#### DATA REVIEW REPORT

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.

<u>SDG #JC84519</u>: 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.

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%

Results for duplicate samples are summarized in the following table.

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.
<u>SDG #JC84519</u>: 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	Rep	orted	Perfo Acce	rmance ptable	Not
	No	Yes	No	Yes	Required
Inductively Coupled Plasma-Atomic Emission Spectromet	ry (ICP-AE	ES)			
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		х	
Laboratory Control Sample Duplicate (LCSD)	х				Х
LCS/LCSD Precision (RPD)	х				Х
Matrix Spike (MS) %R		x	x		
Matrix Spike Duplicate (MSD) %R		x	x		
MS/MSD Precision (RPD)		x		x	
Field/Lab Duplicate (RPD)		x		х	
ICP Serial Dilution %D		x		x	
Total vs. Dissolved	х				Х
Reporting Limit Verification		x		х	
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				Х
Transcription/calculations acceptable		Х		Х	
Raw Data	x				Х
Reporting limits adjusted to reflect sample dilutions		Х		Х	
Notes:					

%R Percent recovery

RPD Relative percent difference

%D Percent difference

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#### 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.

<u>SDGs #JC84311, JC84441, and JC84519</u>: 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%.

<u>SDGs #JC84311, JC84441, and JC84519</u>: 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.

<u>SDG # JC84442 and JC84506</u>: 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  $\pm$  the RL is used.

<u>SDG # JC84442 and JC84506</u>: The laboratory duplicate analysis was not performed using a sample from these SDGs.

<u>SDGs #JC84311, JC84441, and JC84519</u>: 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 Detect	IJ
Parent sample and/or laboratory duplicate sample result < four times the RL	± RL	Non-detect Detect	IJ

# 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	Analyte Sample D 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.

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

# DATA VALIDATION CHECKLIST FOR HEXAVALENT CHROMIUM

%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		Analysis: 3 days	
BS-F18			
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)	SW846 9045D		< 24 hours of receipt by laboratory
108_M018W2		Holding Time         Analysis: 3 days         Analysis: 4 days         Analysis: 6 days	
108_M018W1		Analysis: 6 days	
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			

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

	Qualifi	cation
Criteria Analysis completed less than two times holding time Analysis completed greater than two times holding time	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

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### 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.

<u>SDGs #JC84311, JC84441, JC84442, and JC84506</u>: The laboratory duplicate analysis was not performed using a sample from these SDGs.

<u>SDG #JC84519</u>: 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
	Redox	373	409	9.2%
SW-A8(6.0-6.5) / DUP-04(20190315)RR	рН	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	Rep	orted	Perfor Accep	mance otable	Not Required
9045D, ASTM D1498-76	No	Yes	No	Yes	Required
Miscellaneous Instrumentation					
Tier II Validation					
Holding times		x	х		
Reporting limits (units)		x		Х	
Blanks					
A. Instrument Blanks		х		Х	
B. Method blanks		х		X	
C. Equipment blanks		Х		Х	
Laboratory Control Sample (LCS) %R		Х		Х	
Laboratory Control Sample Duplicate (LCSD) %R	Х				Х
LCS/LCSD Precision (RPD)	Х				Х
Matrix Spike (MS) %R	Х				Х
Matrix Spike Duplicate (MSD) %R	Х				Х
MS/MSD Precision (RPD)	Х				Х
Field/Lab Duplicate (RPD)		Х		X	
Dilution Factor		Х		X	
Tier III Validation			·		
Initial calibration %RSD or correlation coefficient	Х				Х
Continuing calibration %R	Х				Х
Raw Data		Х		Х	
Transcription/calculation errors present		x		Х	
Reporting limits adjusted to reflect sample dilutions		x		X	
Notes:					

%R Percent recovery

RPD Relative percent difference

VALIDATION PERFORMED BY: Jennifer Singer

SIGNATURE:

Annifer Alinger

DATE: July 15, 2019

PEER REVIEW: Dennis Capria

DATE: July 18, 2019

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# CHAIN OF CUSTODY CORRECTED SAMPLE ANALYSIS DATA SHEETS



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JC84311: Chain of Custody Page 1 of 2

3.4



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5.2 5

#### SGS LabLink@1045417 08:46 10-Jul-2019

Chromium, Hexavalent

Analyte	Result	RL	Units	DF	Analyzed	By	Method						
General Chemistry	y												
Project:	PPG Site 107, 18 Cha	pel Avenue	e, Jersey Ci	y, NJ									
Matrix:	AQ - Field Blank Soil				Date Receive Percent Solie	e <b>d:</b> 03 ds: n/a	a/13/19						
Client Sample ID: Lab Sample ID:	FB(20190313)-A JC84311-1				Date Sampled: 03/13/19								

mg/l

1

# **Report of Analysis**

4.1

Redox Potential Vs H2	483	mv	1	03/18/19 12:22	RI	ASTM D1498-76
pH <sup>a</sup>	5.03	su	1	03/13/19 17:00	DDH	SM4500H+ B-11
(a) Sample received out of hol	ding time for pH	analysis.				

0.010

< 0.010

03/13/19 18:20 JOO SW846 7196A



SGS

Client Sample ID:	BS-B0		
Lab Sample ID:	JC84311-2	Date Sampled:	03/13/19
Matrix:	SO - Soil	Date Received:	03/13/19
		<b>Percent Solids:</b>	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

### Page 1 of 1

4.2



#### SGS LabLink@1045417 08:47 10-Jul-2019

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
		<b>Percent Solids:</b>	n/a
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

# **Report of Analysis**

#### **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 <sup>1</sup>	SW846 3010A <sup>2</sup>
Chromium	< 10	10	ug/l	1	03/14/19	03/14/19 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>
Nickel	< 10	10	ug/l	1	03/14/19	03/14/19 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>
Thallium	< 10	10	ug/l	1	03/14/19	03/14/19 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>
Vanadium	< 50	50	ug/l	1	03/14/19	03/14/19 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA46306

(2) Prep QC Batch: MP13124







#### SGS LabLink@1045417 08:47 10-Jul-2019

Client Sample ID: Lab Sample ID: Matrix: Project:	ample ID:FB(20190313)-Anple ID:JC84311-1AAQ - Field Blank SoilDate Sampled:03/13/19PPG Site 107, 18 Chapel Avenue, Jersey City, NJPercent Solids:n/a										
General Chemistry											
Analyte Result RL Units DF Analyzed By Method											
Chromium, Trivaler	nt <sup>a</sup>	< 0.020	0.020	mg/l	1	03/14/19 15:14	ND	SW846 6010/7196A M			

# **Report of Analysis**

Page 1 of 1

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





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 <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	17.8	1.1	mg/kg	1	03/14/19	03/14/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	15.0	4.5	mg/kg	1	03/14/19	03/14/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>
Thallium <sup>a</sup>	< 2.2	2.2	mg/kg	2	03/14/19	03/14/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>
Vanadium <sup>a</sup>	24.3	11	mg/kg	2	03/14/19	03/14/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA46306

(2) Prep QC Batch: MP13116

(a) Elevated detection limit due to dilution required for high interfering element.







Client Sample ID: Lab Sample ID: Matrix: Project:	BS-B0 JC84311-2ADate Sampled:03/13/19SO - SoilDate Received:03/13/19PPG Site 107, 18 Chapel Avenue, Jersey City, NJPercent Solids:87.7											
General Chemistry	7											
Analyte		Result	RL	Units	DF	Analyzed	By	Method				
Chromium, Trivaler	nt <sup>a</sup>	16.3	1.6	mg/kg	1	03/27/19 16:46	RI	SW846 6010/7196A M				

Page 1 of 1

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





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JC84441: Chain of Custody Page 1 of 2



JC84441

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#### SGS LabLink@1045417 08:47 10-Jul-2019

< 0.010

516

5.41

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

Chromium, Hexavalent

Redox Potential Vs H2

pH <sup>a</sup>

Client Sample ID: Lab Sample ID: Matrix:	FB(20190314)-A JC84441-1 AQ - Field Blank Soi	1			<b>Date Sampled:</b> 03/14/19 <b>Date Received:</b> 03/14/19								
Project:	PPG Site 107, 18 Ch	apel Avenu	e, Jersey Ci	ty, NJ	Percent Sol	ids: n/a							
General Chemistry	7												
Analyte	Result	RL	Units	DF	Analyzed	By Method							

mg/l

mv

su

1

1

1

03/15/19

03/18/19 12:25 RI

03/14/19 20:08 JP

JOO

SW846 7196A

ASTM D1498-76

SM4500H+ B-11

0.010

# **Report of Analysis**

Page 1 of 1

4.1



Lab Sample ID:JC84441-2Date 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

### Page 1 of 1

4.2

4



9 of 50

JC84441

#### SGS LabLink@1045417 08:48 10-Jul-2019

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		

# **Report of Analysis**

#### **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 <sup>1</sup>	SW846 3010A <sup>2</sup>
Chromium	< 10	10	ug/l	1	03/15/19	03/15/19 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>
Nickel	< 10	10	ug/l	1	03/15/19	03/15/19 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>
Thallium	< 10	10	ug/l	1	03/15/19	03/15/19 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>
Vanadium	< 50	50	ug/l	1	03/15/19	03/15/19 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA46314

(2) Prep QC Batch: MP13154



4



#### SGS LabLink@1045417 08:48 10-Jul-2019

Client Sample ID: Lab Sample ID: Matrix: Project:	FB(20190 JC84441- AQ - Fiel PPG Site	0314)-A 1A ld Blank Soil 107, 18 Chaj	pel Avenue,	Jersey Cit	y, NJ	Date Sampled Date Received Percent Solids	: 03, : 03, : n/a	/14/19 /14/19 a
General Chemistry								
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivaler	nt <sup>a</sup>	< 0.020	0.020	mg/l	1	03/15/19 16:50	ND	SW846 6010/7196A M

# **Report of Analysis**

Page 1 of 1

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





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 <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	234	1.2	mg/kg	1	03/15/19	03/15/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	34.7	4.6	mg/kg	1	03/15/19	03/15/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>
Thallium	< 1.2	1.2	mg/kg	1	03/15/19	03/15/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>
Vanadium	49.6	5.8	mg/kg	1	03/15/19	03/15/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA46314

(2) Prep QC Batch: MP13116



4.2 **4** 



Client Sample ID: Lab Sample ID: Matrix: Project:	BS-BO-2 JC84441- SO - Soil PPG Site	-2A 107, 18 Cha	pel Avenue,	Jersey City	, NJ	Date Sampled: Date Received Percent Solids	03/ 03/ 83	/14/19 /14/19 .5
General Chemistry								
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivaler	nt <sup>a</sup>	223	1.7	mg/kg	1	03/29/19 16:05	RI	SW846 6010/7196A M

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

4.2







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Client / Reporting Information			Projec	t Inform	nation													Reques	ted Ar	nalysis				Matrix Codes
Company Name; Ancadis Street Adjuess	Project Name	Site	107 (	Jea H	nst y	16	ły)								Ę	Į								DW - Drinking Water GW - Ground Water WW - Water SW - Surface Water
City State PA 18940	Jensty	· (dy	NUC State NJ	Billing I Company	nformatik y Name	on (if diffe	arent from	Repo	rt to)					ţ	1.42	20								SO - Soll SL- Sludge SED-Sediment OI - Oil
Project Contacts M+Hh EW B+ Phone #	Project #/	0770, (	003	Street Ac	idress				State			Zip		5	Ch,	<u>ح</u>		,	ş					LKQ - Other Liquid AIR - Air SOL - Other Solid WP - Wine
610-755-7080	Project Manag			Attention										's	1	5	}	5	2	2				FB - Field Blank EB-Equipment Blank
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SGS Sample # Field ID / Point of Collection	MEOH/DI Viai #	Date	Time	Sampled	Grab (G) Comp (C)	Matrix	W of bottles	Ę	HOPN	NO, HNO,	NONE	WEOH	ENCORE	7.40	IK XX	Ę	4v	4	2	Ž				LAB USE ONLY
FB(20190714)		3/14/19	1430	CC	G	FB	2			t	1		_	x	X	X	X	X	X	X				
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S Business Days					NJ Re   Full T	educed (L ier I (Lev	evel 3) el 4)				IA MCF T RCP	Criter Criter	ria						IN	ITIAI	L ASI	ESSN	NENT_	SA OU
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EHSA-QAC-0023-02-FORM-Dayton - Standard COC.xisx

JC84442: Chain of Custody Page 1 of 2



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5.2 5

#### SGS LabLink@1045417 08:49 10-Jul-2019

< 0.010

520

5.21

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

Chromium, Hexavalent

Redox Potential Vs H2

pH <sup>a</sup>

Client Sample ID:	FB(20190314)							
Lab Sample ID:	JC84442-1				Date Sampl	ed: 03	6/14/19	
Matrix:	AQ - Field Blank Soil	l			Date Receiv	ved: 03	6/14/19	
					Percent Soli	ids: n/	a	
Project:	PPG Site 107, 18 Cha	pel Avenue	e, Jersey Ci	ty, NJ				
General Chemistry	r							
Analyte	Result	RL	Units	DF	Analyzed	By	Method	

mg/l

mv

su

1

1

1

03/15/19

03/18/19 12:30 RI

03/14/19 20:10 јр

0.010

# **Report of Analysis**

#### Page 1 of 1

JOO SW846 7196A

ASTM D1498-76

SM4500H+ B-11



Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		
<b>—</b>		Percent Solids:	67.6
Matrix:	SO - Soil	Date Received:	03/14/19
Lab Sample ID:	JC84442-2	Date Sampled:	03/14/19
Client Sample ID:	BS-F18		

#### **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

### Page 1 of 1

4.2



#### SGS LabLink@1045417 08:49 10-Jul-2019

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		

# **Report of Analysis**

#### **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 <sup>1</sup>	SW846 3010A <sup>2</sup>
Chromium	< 10	10	ug/l	1	03/15/19	03/15/19 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>
Nickel	< 10	10	ug/l	1	03/15/19	03/15/19 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>
Thallium	< 10	10	ug/l	1	03/15/19	03/15/19 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>
Vanadium	< 50	50	ug/l	1	03/15/19	03/15/19 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA46314

(2) Prep QC Batch: MP13154







#### SGS LabLink@1045417 08:49 10-Jul-2019

Client Sample ID: Lab Sample ID: Matrix: Project:	FB(20190 JC84442- AQ - Fiel PPG Site	)314) 1A d Blank Soil 107, 18 Chap	el Avenue,	Jersey City	, NJ	Date Sampled Date Received Percent Solids	: 03/ : 03/ : n/a	/14/19 /14/19
General Chemistry								
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivaler	nt <sup>a</sup>	< 0.020	0.020	mg/l	1	03/15/19 16:55	ND	SW846 6010/7196A M

# **Report of Analysis**

Page 1 of 1

44

4

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





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		

**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 <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	23.8	1.5	mg/kg	1	03/15/19	03/15/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	20.3	5.9	mg/kg	1	03/15/19	03/15/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Thallium	< 1.5	1.5	mg/kg	1	03/15/19	03/15/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Vanadium	28.3	7.4	mg/kg	1	03/15/19	03/15/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA46314

(2) Prep QC Batch: MP13116



4.2 **4** 



SGS

Client Sample ID: Lab Sample ID: Matrix: Project:	BS-F18 JC84442- SO - Soil PPG Site	-2A 107, 18 Cha	pel Avenue,	Jersey Cit	y, NJ	Date Sampled: Date Received: Percent Solids:	03. 03. 67	/14/19 /14/19 .6
General Chemistry								
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivaler	nt <sup>a</sup>	23.8	2.1	mg/kg	1	03/22/19 16:32	RI	SW846 6010/7196A M

Page 1 of 1

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





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

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

JC84506: Chain of Custody Page 1 of 2



5.2

сл

Chromium, Hexavalent

Redox Potential Vs H2

RL = Reporting Limit

pH <sup>a</sup>

Client Sample ID: Lab Sample ID: Matrix:	FB(20190315) JC84506-1 AQ - Field Blank So	oil			Date Sampl Date Receiv	ed: 03/15/19 red: 03/15/19	
Project:	PPG Site 107, 18 Cł	napel Avenu	e, Jersey Ci	ty, NJ	Percent Sol	ids: n/a	
General Chemistry	7						
Analyte	Result	RL	Units	DF	Analyzed	By Method	

mg/l

mv

su

1

1

1

0.010

# **Report of Analysis**

Page 1 of 1

SW846 7196A

ASTM D1498-76

SM4500H+ B-11

03/15/19 22:33 доо

03/18/19 00:15 EB

03/14/19 17:16 јр

4.1

< 0.010

542

5.34

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





<b>Client Sample ID:</b>	BS-F17		
Lab Sample ID:	JC84506-2	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, 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

### Page 1 of 1

4.2


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		

## **Report of Analysis**

**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 <sup>1</sup>	SW846 3010A <sup>2</sup>
Chromium	< 10	10	ug/l	1	03/16/19	03/18/19 GT	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>
Nickel	< 10	10	ug/l	1	03/16/19	03/18/19 GT	SW846 6010D 1	SW846 3010A <sup>2</sup>
Thallium	< 10	10	ug/l	1	03/16/19	03/18/19 GT	SW846 6010D 1	SW846 3010A <sup>2</sup>
Vanadium	< 50	50	ug/l	1	03/16/19	03/18/19 GT	SW846 6010D 1	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA46320

(2) Prep QC Batch: MP13173



4



Client Sample ID:	FB(20190	0315)			•			
Lab Sample ID:	JC84506-	IA I Diania Gali				Date Sampled	: 03	/15/19
	AQ - Fiel	d Blank Soil				Percent Solids	: 03 : n/a	/ 15/ 19 a
Project:	PPG Site	107, 18 Chaj	pel Avenue,	Jersey Cit	y, NJ			
General Chemistry	,							
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivaler	nt <sup>a</sup>	< 0.020	0.020	mg/l	1	03/18/19 14:02	GT	SW846 6010/7196A M

### **Report of Analysis**

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







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 <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	16.2	1.4	mg/kg	1	03/15/19	03/18/19 GT	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	13.6	5.5	mg/kg	1	03/15/19	03/18/19 GT	SW846 6010D 1	SW846 3050B <sup>2</sup>
Thallium	< 1.4	1.4	mg/kg	1	03/15/19	03/18/19 GT	SW846 6010D 1	SW846 3050B <sup>2</sup>
Vanadium	22.7	6.9	mg/kg	1	03/15/19	03/18/19 GT	SW846 6010D 1	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA46320

(2) Prep QC Batch: MP13172



4.2 4



Client Sample ID: Lab Sample ID: Matrix: Project:	BS-F17 JC84506- SO - Soil PPG Site	-2A 107, 18 Cha	apel Avenue	, Jersey Cit	y, NJ	Date Sampled Date Received Percent Solids	: 03 : 03 : 73	/15/19 /15/19 .7
General Chemistry								
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivaler	nt <sup>a</sup>	16.2	1.9	mg/kg	1	03/22/19 16:30	RI	SW846 6010/7196A M

Page 1 of 1

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





<b>SUS</b>	SP		CHAI	N OF		JST	ODY	,										PA	GE	1	OF _	26
	EB		2235	Route 130,	Dayton,	NJ 088	310				FED-EX	Tracking	#				Both	orger Con	-63	819	1-10	18
1	1.1-		TEL. 73	2-329-0200 www.sgs.	FAX .com/ehs	732-329 usa	-3499				SGS Que	ite #					SGS Jo	<sup>6#</sup> C	50	84	519	
Client / Reporting Information			Project	Informatic	'n							Requ	uestec	I Anal	ysis (	see T	EST C	ODE s	sheet)	1.1	N	Aatrix Codes
Compagy Name Anc+ NSS	Project Name:	Site 1	07 (J	ERSE	, Lĩ	H)							Ŵ								DW GW	- Drinking Water / - Ground Water
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NEWDOWN, PA 18940	JENRY	City N	$\mathcal{T}_{-}$	Street Addr							E	ΨP	Yn								5	ED-Sediment OI - Oil
Mathew Bell Phone # Fax #	Client Purchase	770.00	03	City			State	0	Zip		<i>u</i> o z	Chà	Ļ								SC	AIR - Air AIR - Air AIR - Other Solid WP - Wipe
610-755-7080	Dubahhara										1	た	1-			1	5				EB-	B-Field Blank Equipment Blank
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Lab Sample # Field ID / Point of Collection	MEOH/DI Vial	# Date	Time	Sampled by	Matrix	# of bottles	HCI NaOH	HN03 H2SO4	NONE DI Water MEOH	ENCORE	151	नाय]	Hex	ANT	N. c	1.1	( / Y M				4	B USE ONLY
1 FB(20190315) - A		3/15/19	1115	CC	FB	2		1	١		X	Y	X	χ	Х	X	X					66
2 SW-A8 (2.0-2.5)		3/15/19	0920	0c	50	1			1		x	Ŷ	X	Χ	X	X	X					AG
3 SW-AB (4.0-4.0)		7/15/19	0925	CC	so	1		_	1		X	Х	X	X	X	X	X					644
4 JW-AB (4.0-6.0)		3/15/19	0970	(C	SO	)					X	X	Х	χ	X	x	X					
5 108-MB18WZ		7/15/19	0935	32	jo	1					X	Х	Х	χ	X	X	$ \chi $					
6 108-MOIOWI		7/15/19	0940	CC	50	1			i l		X	Χ	Х	γ	X	X	X					
7 SW-A7(0.0-0.5)		\$/15/19	0945	CC	50	1			1		Х	Х	Х	Х	X	Х	ĺΧ					
8 SW-A7(2,0-2,5)		3/15/19	8950	°C	SO	1			1		X	χ	χ	Х	κ	Х	X					
Q SW-A7(4,0-45)		3/15/19	0955	CC	SO	1			1		x	X	X	X	X	X	X					
SW-A7(4.0-4.5) MS		7/15/19	0455	3)	50	1			i		X	X	Х	X	X	Х	X					
10 DUP-04 (20140315) RR		3/15/19	-	CC	So	1			1		X	χ	χ	X	X	Х	X					
Turnaround Time (Business days)						Data	Delivera	ble Info	rmation	D Cata	Constant of	00.0058	10/2005			Com	ments	/ Specia	al Instru	ctions		7
Std. 10 Business Days	Approved by (a	GS Project Manag	er//Date:		ommercia	il "B" (Ler	vel 1) vel 2)	L [		P Categ	jory B				1			ESS	MENT	Th	-26	>
5 Day RUSH			_		ULLT1 (L	.evel 3+4 )	)	Ī	State	Forms										<del>0</del>		
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other			-	Commercial	"A" = Res	ults Only;	Comme	ercial "B'	= Results +	QC Su	mmary											
Emergency & Rush T/A data available via LabLink				NJ Reduce	d = Result	s + QC Su	mmary + F	Partial R	w data		_		Samp	ole inv	rentor	y is v	erified	l upon	receip	t in the	Labora	tory
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Form:SM088-03C (revised 2/12/18)

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

JC84519: Chain of Custody Page 1 of 6



5.2

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SGS	CH	IAIN OF CUSTODY	Page <u>7</u> of <u>2</u>
	TEI	2235 Route 130, Dayton, NJ 08810	FED-EX Tracking # Bottle Order Control #
0		www.sgs.com/ehsusa	SGS Quote # SGS Job # JC84517
Company Name:	Proje	ect Information	Requested Analysis Matrix Codes
Super Address	PPG Site 10-	7 (JEnsey City)	W - Direking Water GW - Ground Water WW - Water SW - Surface Water
NEWTOWN PA	TEACHY CITY NI	Billing Information (if different from Report to) Company Name	SO-Soll SL-Sudge SED-Sedment
Matthew Bell	Project# NS000700.0603	Street Address	
610 -755-7080 Sampler(s) Name(s) Phone N	Client Purchase Order #	City State Zip	WP - Weg FB - Feel Black EB - Feel met
C. Cifelli	Tim Acczughling Ste	Number of preserved Bottles	RB-Rinse Blank TB-Tro Blank
Single # Field ID / Point of Collection	MEOHIDI Vial # Date Time	Sampled (Gab (G) by (Cemp (C) Matrix bottles	
9 SW-A7(40-4,5)mis 11 108-MQ18 F	3/15/19 0955		
12 103 - MOIS - N	3/15/19 20/15	0 6 0 1 1 1 1 1 1 1 1	
13 108 - MBIB -S	2/ 5/19 1010		
		┼╌┼╌┼╌┼┼┼┼┼┼┼┼	$\left  \begin{array}{c} \\ \end{array} \right  \left  \left $
Turn Around Time (Busi	ness Davs)	Free Land Land Land Land Land	Commonts / Special Instructions
A 10 Business Days	pproved By (SGS PM): / Date:	Commercial "A" (Level 1) NYASP Category A     Commercial "B" (Level 2) NYASP Category B     NJ Reduced (Level 3) MA MCP Criteria_	DOD-asses () - HOLD until for ther info
☐ 3 Bueiness Days' 2 Business Days' ☐ 1 Business Day"		Full Tier I (Level 4)     CT RCP Criteria     Commercial "C"     State Forms     NJ DKQP     X EDD Format	
All data available via Lablink Approv	al needed for 1-3 Business Day TAT	Commercial "A" = Results only: Commercial "B" = Res	ults + OC Summary Rew data bttp://www.sps.com/en/terms-apd-conditions
Relinguished by: Jell Date/Time: 21/5/14	Sample Custody m	nuet be documented below each time samples to Summary + Panel	Cuding courier delivery.
Relinquiehed by: Date / Time:	Received By: 3	Relinquished By:	Date / Time: Racelved By: 4
keiingulahed by: Date / Time:	Received By: 5	Custody Seel # 19418	Intact Preserved where applicable On ice Cooler Temp, "C 7 0C

JC84519: Chain of Custody Page 2 of 6





JC84519

Client Sample ID: Lab Sample ID: Matrix:	FB(20190315)-A JC84519-1 AQ - Field Blank So	il			Date Sample Date Receive	<b>d:</b> 03/15/19 <b>d:</b> 03/15/19	
Project:	PPG Site 107, 18 Ch	apel Avenu	e, Jersey Ci	ty, NJ	Percent Solid	<b>ls:</b> n/a	
General Chemistry	7						
Analyte	Result	RL	Units	DF	Analyzed	By Method	

mg/l

mv

su

1

1

1

0.010

### **Report of Analysis**

Page 1 of 1

03/15/19 22:33 JOO SW846 7196A

ASTM D1498-76

SM4500H+ B-11

03/21/19 00:15 ЕВ

03/15/19 17:40 јр

#### Redox Potential Vs H2 488 pH <sup>a</sup> 5.46

Chromium, Hexavalent

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

< 0.010



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
		<b>Percent Solids:</b>	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

### Page 1 of 1

4.2



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
		<b>Percent Solids:</b>	86.5
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		
<u> </u>			

### **General Chemistry**

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent Redox Potential Vs H2	< 0.46 <b>UJ</b> 374	0.46	mg/kg mv	1 1	03/22/19 16:30 03/21/19 21:04	RI EB	SW846 3060A/7196A ASTM D1498-76M
Solids, Percent pH	86.5 7.17 J		% su	1	03/17/19 12:35 03/21/19 20:50	BG EB	SM2540 G 18TH ED MOD SW846 9045D

### Page 1 of 1

4.3



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
		<b>Percent Solids:</b>	87.6
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

## **Report of Analysis**

### **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

### Page 1 of 1

4.4

Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	Percent Solids:	87.1
Matrix:	SO - Soil	Date Received:	03/15/19
Client Sample ID: Lab Sample ID:	108_M018W2 JC84519-5	Date Sampled:	03/15/19

#### 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

### Page 1 of 1

4.5



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		
Conoral Chamistry			·

#### **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

### Page 1 of 1

4.6



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		

## **Report of Analysis**

### **General Chemistry**

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent Redox Potential Vs H2	12.5 J 340	0.50	mg/kg my	1	03/22/19 16:30	RI FB	SW846 3060A/7196A 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

### Page 1 of 1

4.7



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		

## **Report of Analysis**

#### **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

### Page 1 of 1

4.8



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
		<b>Percent Solids:</b>	83.9
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

## **Report of Analysis**

### **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

### Page 1 of 1

4.9



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		

## **Report of Analysis**

### **General Chemistry**

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent Redox Potential Vs H2	< 0.45 UJ 409	0.45	mg/kg mv	1	03/22/19 16:30 03/21/19 22:21	RI EB	SW846 3060A/7196A ASTM D1498-76M
pH	88.7 7.25 J		% su	1 1	03/17/19 12:35 03/21/19 21:46	BG EB	SM2540 G 18TH ED MOD SW846 9045D

### Page 1 of 1





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		
C			

#### 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

### Page 1 of 1

4.11 **4** 

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		

## **Report of Analysis**

### **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 <sup>1</sup>	SW846 3010A <sup>2</sup>
Chromium	< 10	10	ug/l	1	03/16/19	03/18/19 GT	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>
Nickel	< 10	10	ug/l	1	03/16/19	03/18/19 GT	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>
Thallium	< 10	10	ug/l	1	03/16/19	03/18/19 GT	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>
Vanadium	< 50	50	ug/l	1	03/16/19	03/18/19 GT	SW846 6010D 1	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA46320

(2) Prep QC Batch: MP13173



4



Client Sample ID: Lab Sample ID: Matrix: Project:	FB(20190 JC84519- AQ - Fiel PPG Site	)315)-A 1A d Blank Soil 107, 18 Chap	el Avenue,	Jersey Cit	y, NJ	Date Sampled: Date Received Percent Solids	03, 03, n/a	/15/19 /15/19 a	
General Chemistry	7								
Analyte	Result RL Units DF Analyzed By Method								
Chromium, Trivaler	nt <sup>a</sup>	< 0.020	0.020	mg/l	1	03/18/19 14:07	GT	SW846 6010/7196A M	

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

### Page 1 of 1





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 <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	160	1.2	mg/kg	1	03/15/19	03/18/19 GT	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	19.5	5.0	mg/kg	1	03/15/19	03/18/19 GT	SW846 6010D 1	SW846 3050B <sup>2</sup>
Thallium	< 1.2	1.2	mg/kg	1	03/15/19	03/18/19 GT	SW846 6010D 1	SW846 3050B <sup>2</sup>
Vanadium	25.7	6.2	mg/kg	1	03/15/19	03/18/19 GT	SW846 6010D 1	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA46320

(2) Prep QC Batch: MP13172



4.2



Client Sample ID: Lab Sample ID: Matrix: Project:	SW-A8(2 JC84519- SO - Soil PPG Site	.0-2.5) 2A 107, 18 Cha	apel Avenue,	Jersey Cit	y, NJ	Date Sampled: Date Received Percent Solids	03 03 80	/15/19 /15/19 .0
General Chemistry	,							
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivaler	nt <sup>a</sup>	143	1.7	mg/kg	1	03/22/19 16:30	RI	SW846 6010/7196A M

Page 1 of 1

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





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		

## **Report of Analysis**

#### **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 <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	20.2	1.1	mg/kg	1	03/15/19	03/18/19 GT	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	13.7	4.5	mg/kg	1	03/15/19	03/18/19 GT	SW846 6010D 1	SW846 3050B <sup>2</sup>
Thallium	< 1.1	1.1	mg/kg	1	03/15/19	03/18/19 GT	SW846 6010D 1	SW846 3050B <sup>2</sup>
Vanadium	31.4	5.6	mg/kg	1	03/15/19	03/18/19 GT	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA46320

(2) Prep QC Batch: MP13172







Client Sample ID: Lab Sample ID: Matrix: Project:	SW-A8(4 JC84519- SO - Soil PPG Site	.0-4.5) 3A 107, 18 Cha	pel Avenue,	Date Sampled: Date Received Percent Solids	: 03, : 03, : 86	/15/19 /15/19 .5		
General Chemistry	•							
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivaler	nt <sup>a</sup>	20.2	1.6	mg/kg	1	03/22/19 16:30	RI	SW846 6010/7196A M

Page 1 of 1

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





Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		
		Percent Solids:	87.6
Matrix:	SO - Soil	Date Received:	03/15/19
Lab Sample ID:	JC84519-4A	Date Sampled:	03/15/19
Client Sample ID:	SW-A8(6.0-6.5)		

## **Report of Analysis**

#### **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 <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	16.6	1.2	mg/kg	1	03/15/19	03/18/19 GT	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	14.0	4.8	mg/kg	1	03/15/19	03/18/19 GT	SW846 6010D 1	SW846 3050B <sup>2</sup>
Thallium	< 1.2	1.2	mg/kg	1	03/15/19	03/18/19 GT	SW846 6010D 1	SW846 3050B <sup>2</sup>
Vanadium	23.8	6.0	mg/kg	1	03/15/19	03/18/19 GT	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA46320

(2) Prep QC Batch: MP13172



4.4 **4** 



Client Sample ID: Lab Sample ID: Matrix: Project:	SW-A8(6.0-6.5)Date SampJC84519-4ADate ReceipSO - SoilDate ReceipPPG Site 107, 18 Chapel Avenue, Jersey City, NJ							/15/19 /15/19 .6
General Chemistry	,							
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivaler	nt <sup>a</sup>	16.2	1.7	mg/kg	1	03/22/19 16:30	RI	SW846 6010/7196A M

Page 1 of 1

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





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 <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	32.0	1.1	mg/kg	1	03/15/19	03/18/19 GT	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	14.9	4.5	mg/kg	1	03/15/19	03/18/19 GT	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Thallium	< 1.1	1.1	mg/kg	1	03/15/19	03/18/19 GT	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Vanadium	36.1	5.6	mg/kg	1	03/15/19	03/18/19 GT	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA46320

(2) Prep QC Batch: MP13172









Client Sample ID: Lab Sample ID: Matrix: Project: General Chemistry	108_M01 JC84519- SO - Soil PPG Site	8W2 5A 107, 18 Cha	apel Avenue,	Jersey Cit	Date Sampled: Date Received Percent Solids	03. 03. 87	/15/19 /15/19 .1	
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivaler	nt <sup>a</sup>	31.5	1.6	mg/kg	1	03/22/19 16:30	RI	SW846 6010/7196A M

Page 1 of 1

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





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		

**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 <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	149	1.1	mg/kg	1	03/15/19	03/18/19 GT	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	20.0	4.5	mg/kg	1	03/15/19	03/18/19 GT	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Thallium <sup>a</sup>	< 2.2	2.2	mg/kg	2	03/15/19	03/18/19 GT	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Vanadium	25.5	5.6	mg/kg	1	03/15/19	03/18/19 GT	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA46320

(2) Prep QC Batch: MP13172

(a) Elevated detection limit due to dilution required for high interfering element.

Page 1 of 1





Client Sample ID: Lab Sample ID: Matrix: Project:	108_M01 JC84519- SO - Soil PPG Site	8W1 6A 107, 18 Cha	pel Avenue,	Date Sampled: Date Received: Percent Solids:	03/ 03/ 86	/15/19 /15/19 .9		
General Chemistry								
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivaler	nt <sup>a</sup>	146	1.6	mg/kg	1	03/22/19 16:30	RI	SW846 6010/7196A M

Page 1 of 1

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





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
		<b>Percent Solids:</b>	79.7
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

## **Report of Analysis**

#### **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 <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	691	1.2	mg/kg	1	03/15/19	03/18/19 GT	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	22.5	4.9	mg/kg	1	03/15/19	03/18/19 GT	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Thallium	< 1.2	1.2	mg/kg	1	03/15/19	03/18/19 GT	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Vanadium	46.0	6.1	mg/kg	1	03/15/19	03/18/19 GT	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA46320

(2) Prep QC Batch: MP13172



4.7 4



Client Sample ID: Lab Sample ID: Matrix: Project:	SW-A7(0 JC84519- SO - Soil PPG Site	0.0-0.5) -7A 107, 18 Cha	upel Avenue,	Jersey City	7, NJ	Date Sampled: Date Received Percent Solids	03/ 03/ 79	/15/19 /15/19 .7
General Chemistry								
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivaler	nt <sup>a</sup>	679	1.7	mg/kg	1	03/22/19 16:30	RI	SW846 6010/7196A M

Page 1 of 1

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





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		

## **Report of Analysis**

#### **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 <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	317	1.3	mg/kg	1	03/15/19	03/18/19 GT	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	17.6	5.1	mg/kg	1	03/15/19	03/18/19 GT	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Thallium	< 1.3	1.3	mg/kg	1	03/15/19	03/18/19 GT	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Vanadium	44.8	6.4	mg/kg	1	03/15/19	03/18/19 GT	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA46320

(2) Prep QC Batch: MP13172



4.8 4



25 of 220

Client Sample ID: Lab Sample ID: Matrix: Project:	SW-A7(2 JC84519- SO - Soil PPG Site	W-A7(2.0-2.5)       Date Sampled:       03/15/19         C84519-8A       Date Received:       03/15/19         SO - Soil       Date Received:       03/15/19         PPG Site 107, 18 Chapel Avenue, Jersey City, NJ       Percent Solids:       81.8								
General Chemistry	,									
Analyte		Result	RL	Units	DF	Analyzed	By	Method		
Chromium, Trivaler	nt <sup>a</sup>	313	1.8	mg/kg	1	03/22/19 16:30	RI	SW846 6010/7196A M		

Page 1 of 1

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



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
		<b>Percent Solids:</b>	83.9
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

## **Report of Analysis**

#### **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 <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	67.1	1.2	mg/kg	1	03/15/19	03/18/19 GT	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	13.3	4.7	mg/kg	1	03/15/19	03/18/19 GT	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Thallium	< 1.2	1.2	mg/kg	1	03/15/19	03/18/19 GT	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Vanadium	21.3	5.9	mg/kg	1	03/15/19	03/18/19 GT	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA46320

(2) Prep QC Batch: MP13172









Client Sample ID: Lab Sample ID: Matrix: Project:	SW-A7(4 JC84519- SO - Soil PPG Site	W-A7(4.0-4.5)       Date Sampled:       03/15/19         C84519-9A       Date Received:       03/15/19         O - Soil       Date Received:       03/15/19         PG Site 107, 18 Chapel Avenue, Jersey City, NJ       Percent Solids:       83.9								
General Chemistry										
Analyte		Result	RL	Units	DF	Analyzed	By	Method		
Chromium, Trivaler	nt <sup>a</sup>	65.1	1.7	mg/kg	1	03/22/19 16:23	RI	SW846 6010/7196A M		

Page 1 of 1

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



Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		
		Percent Solids:	88.7
Matrix:	SO - Soil	Date Received:	03/15/19
Lab Sample ID:	JC84519-10A	Date Sampled:	03/15/19
Client Sample ID:	DUP-04(20190315)RR		

## **Report of Analysis**

#### **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 <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	15.6	1.1	mg/kg	1	03/15/19	03/18/19 GT	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	11.5	4.6	mg/kg	1	03/15/19	03/18/19 GT	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Thallium	< 1.1	1.1	mg/kg	1	03/15/19	03/18/19 GT	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Vanadium	23.4	5.7	mg/kg	1	03/15/19	03/18/19 GT	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA46320

(2) Prep QC Batch: MP13172






Client Sample ID: Lab Sample ID: Matrix: Project:	DUP-04(2 JC84519- SO - Soil PPG Site	20190315)R 10A 107, 18 Cha	R apel Avenue,	Jersey Cit	y, NJ	Date Sampled Date Received Percent Solids	: 03 : 03 : 88	/15/19 /15/19 .7
General Chemistry	,							
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivaler	nt <sup>a</sup>	15.2	1.6	mg/kg	1	03/22/19 16:30	RI	SW846 6010/7196A M

## **Report of Analysis**

Page 1 of 1

4.10 4

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



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		

## **Report of Analysis**

**Metals Analysis** 

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Antimony	3.9 <b>J</b> -	3.2	mg/kg	1	03/28/19	03/29/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	1210	1.6	mg/kg	1	03/28/19	03/29/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	40.7	6.3	mg/kg	1	03/28/19	03/29/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>
Thallium	< 1.6	1.6	mg/kg	1	03/28/19	03/29/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>
Vanadium	59.3	7.9	mg/kg	1	03/28/19	03/29/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA46390

(2) Prep QC Batch: MP13594







Client Sample ID:	108_M01	8_E						
Lab Sample ID:	JC84519-	11A				Date Sampled	: 03	3/15/19
Matrix:	SO - Soil					Date Received	: 03	6/15/19
						Percent Solids	: 60	0.1
Project:	PPG Site	107, 18 Cha	pel Avenue	, Jersey Cit	y, NJ			
General Chemistry								
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivaler	nt <sup>a</sup>	1210	2.3	mg/kg	1	03/29/19 14:23	ND	SW846 6010/7196A M

## **Report of Analysis**

Page 1 of 1

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







**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:

				Sample		Analysis		
SDG	Sample ID	Lab ID	Matrix	Collection Date	Parent Sample	Cr VI	MET	MISC
	FB(20190318)-A	JC84633-1	Water	3/18/2019		Х	Х	х
	SW-A9(0.0-0.5)	JC84633-2	Soil	3/18/2019		Х	Х	х
	SW-A9(2.0-2.5)	JC84633-3	Soil	3/18/2019		х	х	х
	SW-A9(4.0-4.5)	JC84633-4	Soil	3/18/2019		х	х	х
JC84633	SW-A9(5.5-6.0)	JC84633-5	Soil	3/18/2019		Х	Х	х
	SW-A10(4.0-4.5)	JC84633-6	Soil	3/18/2019		х	х	х
	SW-A10(6.0-6.5)	JC84633-7	Soil	3/18/2019		х	х	х
	SW-A10(7.5-8.0)	JC84633-8	Soil	3/18/2019		х	х	х
	FB(20190326)	JC85175-1	Water	3/26/2019		Х	Х	Х
	SW-A58(0.0-0.5)	JC85175-2	Soil	3/26/2019		х	х	х
	SW-A58(2.0-2.5)	JC85175-3	Soil	3/26/2019		х	х	х
JC85175	SW-A58(4.0-4.5)	JC85175-4	Soil	3/26/2019		х	х	х
	SW-A58(5.0-5.5)	JC85175-5	Soil	3/26/2019		Х	Х	х
	BS-J5	JC85175-6	Soil	3/26/2019		Х	Х	х
	107_D019	JC85175-7	Soil	3/26/2019		Х	Х	х

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.

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

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
	Water	180 days from collection to analysis	Preserved to a pH of less than 2; Cool to <6°C
SW-846 6010C	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.

<u>SDG #JC85175</u>: 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	Sample Location Analyte		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
	Non-detect	UJ-
MS/MSD percent recovery 30% to 74%	Detect	J-
	Non-detect	R
MS/MSD percent recovery < 30%	Detect	J-
	Non-detect	No Action
MS/MSD percent recovery > 125%	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  $\pm$  the RL is applied.

SDG #JC84633: The laboratory duplicate analysis was not performed using a sample from this SDG.

<u>SDG #JC85175</u>: 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.

<u>SDG #JC85175</u>: 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	Rep	orted	Perfo Acce	rmance ptable	Not
	No	Yes	No	Yes	Required
Inductively Coupled Plasma-Atomic Emission Spectromet	ry (ICP-AE	S)			
Tier II Validation					
Holding Times		x		x	
Reporting limits (units)		х		Х	
Blanks					
A. Instrument Blanks		х		x	
B. Method Blanks		Х		X	
C. Equipment/Field Blanks		х		x	
Laboratory Control Sample (LCS)		x		x	
Laboratory Control Sample Duplicate (LCSD)	Х				Х
LCS/LCSD Precision (RPD)	Х				Х
Matrix Spike (MS) %R		Х	х		
Matrix Spike Duplicate (MSD) %R		Х	х		
MS/MSD Precision (RPD)		x		x	
Field/Lab Duplicate (RPD)	Х				Х
ICP Serial Dilution %D		x		x	
Total vs. Dissolved	Х				Х
Reporting Limit Verification		Х		Х	
Tier III Validation					·
Initial Calibration Verification		x		x	
Continuing Calibration Verification		x		x	
CRDL Standard Recovery		Х		Х	
ICP Interference Check		Х		Х	
ICP-MS Internal Standards	х				Х
Transcription/calculations acceptable		Х		Х	
Raw Data	х				Х
Reporting limits adjusted to reflect sample dilutions		Х		Х	
Notes:					

%R Percent recovery

RPD Relative percent difference

%D Percent difference

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#### 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.

<u>SDG #JC84633</u>: 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.

<u>SDG #JC85175</u>: 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.

<u>SDG #JC84633</u>: 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 <sup>1</sup>		
	Non-detect	UJ-		
Spike recovery ≥ 50% but < 75%	Detect	J-		
0.1	Non-detect	R		
Spike recovery < 50%	Detect	R		
Spike recovery > 125%	Non-detect	No Action		
Spike recovery > 125% but ≤ 150%	Detect	J+		
Spike recovery > 150%	Detect	R		

Notes:

<sup>1</sup> 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.

<u>SDG #JC84633</u>: 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%.

<u>SDGs #JC84633 and JC85175</u>: 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  $\pm$  the RL is used.

<u>SDG #JC85175</u>: The laboratory duplicate analysis performed on sample location SW-A58(4.0-4.5) exhibited results within the control limit.

<u>SDG #JC84633</u>: 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	> 20%	Non-detect	UJ
sample result > four times the RL	he RL > 20%		J
Parent sample and/or laboratory duplicate		Non-detect	UJ
sample result < four times the RL	± RL	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.

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

#### DATA VALIDATION CHECKLIST FOR HEXAVALENT CHROMIUM

%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)		Analysis: 4 days							
SW-A10(4.0-4.5)									
SW-A10(6.0-6.5)									
SW-A10(7.5-8.0)	SW846 9045D		< 24 hours of receipt by laboratory						
SW-A58(0.0-0.5)									
SW-A58(2.0-2.5)									
SW-A58(4.0-4.5)		Analysis: 7 days							
SW-A58(5.0-5.5)									
BS-J5									
107_D019									

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

	Qualifi	cation
Criteria	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.

<u>SDG #JC84633</u>: The laboratory duplicate analysis performed on sample location SW-A9(0.0-0.5) exhibited results within the control limit.

<u>SDG #JC85175</u>: 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		orted	Perfor Accep	Performance No Acceptable Regu		
9045D, ASTM D1498-76	No	Yes	No	Yes	Required	
Miscellaneous Instrumentation						
Tier II Validation						
Holding times		x	х			
Reporting limits (units)		x		Х		
Blanks						
A. Instrument Blanks		х		Х		
B. Method blanks		х		X		
C. Equipment blanks		Х		Х		
Laboratory Control Sample (LCS) %R		Х		Х		
Laboratory Control Sample Duplicate (LCSD) %R	Х				Х	
LCS/LCSD Precision (RPD)	Х				Х	
Matrix Spike (MS) %R	Х				Х	
Matrix Spike Duplicate (MSD) %R	Х				Х	
MS/MSD Precision (RPD)	Х				Х	
Field/Lab Duplicate (RPD)		Х		X		
Dilution Factor		Х		X		
Tier III Validation			·			
Initial calibration %RSD or correlation coefficient	Х				Х	
Continuing calibration %R	Х				Х	
Raw Data		Х		Х		
Transcription/calculation errors present		x		Х		
Reporting limits adjusted to reflect sample dilutions		x		X		
Notes:						

%R Percent recovery

RPD Relative percent difference

VALIDATION PERFORMED BY: Jennifer Singer

SIGNATURE:

Annifer Alinger

DATE: July 15, 2019

PEER REVIEW: Dennis Capria

DATE: July 18, 2019

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# CHAIN OF CUSTODY CORRECTED SAMPLE ANALYSIS DATA SHEETS



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Client / Reporting Information	Designet Manual		Project	Informatic	m								Req	uestec	Anal	ysis (	see Ti	STC	ODE si	heet)			Matrix Codes
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Lab Sample # Field ID / Point of Collection	MEOH/DI Vial #	Date	Time	Sampled by	Matrix	# of bottles	Ę	HN03	H2SOA NONE	DI Water MEOH	ENCORE	K	7	#	Ą,	٧٩	Ν	17					LAB USE ONLY
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2 SW-A9(0.0-0.5)		B/15/19	1200	11	50	1	$\square$	_		$\square$	$\downarrow \downarrow$	X	X	X	X	X	X	χ					My
3 5W-A9(2.0-2.5)		B 10 11	1205	<i>CC</i>	10			-	1			X	X	Ϋ́	X	X	X	X	_				
4 SW - A9(4.0 - 4.5)		3/18/19	1210	CC	so	1_	$\downarrow$	-	1	$\square$	$\square$	X	X	X	X	X	X	X					DIA
5 SW - A9 (5.5-6.0)		3/18/19	1215	<i>ec</i>	SO	1	$\square$	-	1	11	₩.	X	X	X	X	X	X	X				_	
6 SW-AIO (4.0-4.5)		3118/19	12.25	CC	so	1	$\downarrow$	+		$\left  \right $	++	X	X	X	X	X	X	X				_	
7 SW-AIO (6.0-6.5)		3/18/19	1230	CC	<u>so</u>	1	$\vdash$	+		11	$\vdash$	ĻΧ_	ΙĂ,	X	X	X	Å	X				-	
8 SW-A10(7,5-8.0)		3 18/19	1235	CC	20	1	$\left  + \right $	+	1	$\left  \right $	$\left  \cdot \right $	<u>⊢x</u>	X	X	X	Х	X	X				-	
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Emergency & Rush T/A data available via Lablink				Commercial NJ Reducer	"A" = Resulte	uits Only;	Con	nmerci	al "B" = I ial Raw	Results data	+ QC Su	mmary		Sam	ole inv	/entor	v is ve	arified	upon	recein	t in the	e Lah	oratory
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Form:SM088-03C (revised 2/12/18)

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

JC84633: Chain of Custody Page 1 of 3



5.2

Client Sample ID: Lab Sample ID: Matrix:	FB(20190318)-A JC84633-1 AQ - Field Blank Soi	1			Date Sample Date Receiv	ed: 03/18	8/19 8/19
Project:	PPG Site 107, 18 Ch	apel Avenue	e, Jersey Ci	ty, NJ	Percent Soli	ids: n∕a	
General Chemistry	r						
Analyte	Result	RL	Units	DF	Analyzed	By I	Method

## **Report of Analysis**

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	< 0.010	0.010	mg/l	1	03/18/19 23:1	5 јо	SW846 7196A
Redox Potential Vs H2	465		mv	1	03/22/19 23:2	0 ев	ASTM D1498-76
pH <sup>a</sup>	4.06		su	1	03/18/19 17:0	0 AS	SM4500H+ B-11

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





Client Sample ID:	SW-A9(0.0-0.5)		
Lab Sample ID:	JC84633-2	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		
			,

## **Report of Analysis**

#### **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

#### Page 1 of 1

4.2

<b>Client Sample ID:</b>	SW-A9(2.0-2.5)		
Lab Sample ID:	JC84633-3	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		

## **Report of Analysis**

#### **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

#### Page 1 of 1

4.3



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		

## **Report of Analysis**

#### **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

#### Page 1 of 1

4.4



Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		
		Percent Solids:	85.5
Matrix:	SO - Soil	Date Received:	03/18/19
Lab Sample ID:	JC84633-5	Date Sampled:	03/18/19
Client Sample ID:	SW-A9(5.5-6.0)		

## **Report of Analysis**

#### **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

#### Page 1 of 1

4.5



Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		
		Percent Solids:	84.2
Matrix:	SO - Soil	Date Received:	03/18/19
Lab Sample ID:	JC84633-6	Date Sampled:	03/18/19
Client Sample ID:	SW-A10(4.0-4.5)		

## **Report of Analysis**

#### **General Chemistry**

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent Redex Potential Vs H2	< 0.48 UJ	0.48	mg/kg	1	04/01/19 13:47	RI	SW846 3060A/7196A
Solids, Percent	84.2		111V %	1	03/19/19 09:15	EB RC	SM2540 G 18TH ED MOD
pH	6.69 J		su	1	03/22/19 20:19	EB	SW846 9045D

#### Page 1 of 1

4.6



Client Sample ID:	SW-A10(6.0-6.5)		
Lab Sample ID:	JC84633-7	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		
			,

## **Report of Analysis**

#### 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

#### Page 1 of 1

15 of 61

JC84633



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		

## **Report of Analysis**

#### **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

#### Page 1 of 1

4.8



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Keport of Analysis								Page 1 of 1	
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		4
Project:	PPG Site 10	7, 18 Chapel	Avenue,	Jersey City,	NJ				
General Chemistr	У					<u> </u>			I
Analyte	R	esult	RL	Units	DF	Analyzed	By Metho	od	
Chromium, Hexav	alent 16	5.3	0.51	mg/kg	1	04/11/19 16:13 H	RI SW846	3060A/7196A	_

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Report of Analysis								
Client Sample ID:	SW-A9(2.0-2.5)							
Lab Sample ID:	JC84633-3R				<b>Date Sampled:</b> 03/18/1	9		
Matrix:	SO - Soil				<b>Date Received:</b> 03/18/1	9		
					Percent Solids: 68.5			
Project:	PPG Site 107, 18 Cha	apel Avenue	, Jersey Cit	y, NJ				
General Chemistry	y							
Analyte	Result	RL	Units	DF	Analyzed By Me	thod		
Chromium, Hexava	alent 1.5	0.58	mg/kg	1	04/11/19 16:13 RI SW8	346 30 <del>60</del> A/7196A		



4.2 4

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		Repo	rt of An	alysis	Page 1 of 1
Client Sample ID: Lab Sample ID: Matrix:	SW-A9(4.0-4.5) JC84633-4R SO - Soil				Date Sampled: 03/18/19 Date Received: 03/18/19 Percent Solids: 83.8
Project: General Chemistry	PPG Site 107, 18 Cha	apel Ave <del>n</del> ue	. Jersey Cit	y, NJ	
Analyte	Result	RL	Units	DF	Analyzed By Method
Chromium, Hexava	lent 2.3	0.48	mg/kg	1	04/11/19 16:13 RI SW846 3060A/7196A





				-	-
SW-A9(5	.5-6.0)				
JC84633-	5R				<b>Date Sampled:</b> 03/18/19
SO - Soil					<b>Date Received:</b> 03/18/19
					Percent Solids: 85.5
PPG Site	107, 18 Ch	apel Avenue	, Jersey Cit	y, NJ	
	Result	RL	Units	DF	Analyzed By Method
nt	2.6	0.47	mg/kg	1	04/11/19 16:05 ri sw846.3060A/7196A
	SW-A9(5 IC84633- SO - Soif PPG Site	SW-A9(5.5-6.0) IC84633-5R SO - Soil PPG Site 107, 18 Cha Result nt 2.6	SW-A9(5.5-6.0) IC84633-5R SO - Soil PPG Site 107, 18 Chapel Avenue <b>Result RL</b> nt 2.6 0.47	SW-A9(5.5-6.0) IC84633-5R SO - Soil PPG Site 107, 18 Chapel Avenue, Jersey City Result RL Units nt 2.6 0.47 mg/kg	SW-A9(5.5-6.0)   ICS4633-5R   SO - Soil   PPG Site 107, 18 Chapel Avenue, Jersey City, NJ   Result RL Units DF   nt 2.6 0.47 mg/kg 1



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		Repo	rt of An	alysis		Page 1 of 1
Client Sample ID: Lab Sample ID: Matrix:	SW-A10(4.0-4.5) JC84633-6R SO - Soil				Date Sampled: 03 Date Received: 03 Parcent Solids: 84	/18/19 /18/19
Project:	PPG Site 107, 18 C	Chapel Avenue	Jersey Cit	y, NJ	Tercent Solids. 64	
General Chemistry	7					
Analyte	Result	RL	Units	DF	Analyzed By	Method
Chromium, Hexava	lent 6.2	0.48	mg/kg	1	04/11/19 16:13 ri	SW846 3060A/7196A

#### RL = Reporting Limit
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		Repo	ort of An	alysis	Page 1 of 1
Client Sample IB: Lab Sample ID: Matrix:	SW-A10(6.0-6.5) JC84633-7R SO - Soil				Date Sampled: 03/18/19 Date Received: 03/18/19 Percent Solide: 78 0
Project:	PPG Site 107, 18 Cha	pel Avenue	e, Jersey Cit	y, NJ	Tercent Sonus. 78.0
Analyte	y Result	RL	Units	DF	Analyzed By Method
Chromium, Hexav	alent < 0.51	0.51	mg/kg	1	04/11/19 16:13 RI SW846 3060A/7196A



		Repo	rt of An	alysis		Page 1 of 1
Client Sample ID: SW-A	10(7.5-8.0)					
Lab Sample ID: JC846	33-8R				<b>Date Sampled:</b> 03/18/19	)
Matrix: SO - S	Soil				<b>Date Received:</b> 03/18/19	)
					Percent Solids: 79.7	
Project: PPG S	Site 107, 18 Cha	pel Avenue	, Jersey Cit	y, NJ		
General Chemistry						
Analyte	Result	RL	Units	DF	Analyzed By Met	hod
Chromium, Hexavalent	1.8	0.50	mg/kg	1	04/11/19 16:13 RI SW84	46 3060A/7196A



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
		<b>Percent Solids:</b>	n/a
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

## **Report of Analysis**

### **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 <sup>1</sup>	SW846 3010A <sup>3</sup>
Chromium	< 10	10	ug/l	1	03/19/19	03/20/19 GT	SW846 6010D <sup>2</sup>	SW846 3010A <sup>3</sup>
Nickel	< 10	10	ug/l	1	03/19/19	03/19/19 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>3</sup>
Thallium	< 10	10	ug/l	1	03/19/19	03/19/19 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>3</sup>
Vanadium	< 50	50	ug/l	1	03/19/19	03/20/19 GT	SW846 6010D <sup>2</sup>	SW846 3010A <sup>3</sup>

(1) Instrument QC Batch: MA46328

(2) Instrument QC Batch: MA46330

(3) Prep QC Batch: MP13209







Client Sample ID: Lab Sample ID: Matrix: Project:	FB(20190 JC84633- AQ - Fiel PPG Site	9318)-A 1A d Blank Soil 107, 18 Chap	el Avenue,	Jersey City	, NJ	Date Sampled Date Received Percent Solids	: 03/ : 03/ : n/a	/18/19 /18/19
General Chemistry								
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivaler	nt <sup>a</sup>	< 0.020	0.020	mg/l	1	03/20/19 09:17	GT	SW846 6010/7196A M

### **Report of Analysis**

Page 1 of 1

4.1

4





Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	Percent Solids:	78.7
Matrix:	SO - Soil	Date Received:	03/18/19
Lab Sample ID:	JC84633-2A	Date Sampled:	03/18/19
Client Sample ID:	SW-A9(0.0-0.5)		

# **Report of Analysis**

#### **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 <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	135	1.3	mg/kg	1	03/18/19	03/19/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	20.1	5.2	mg/kg	1	03/18/19	03/19/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Thallium	< 1.3	1.3	mg/kg	1	03/18/19	03/19/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Vanadium	63.9	6.5	mg/kg	1	03/18/19	03/19/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA46328

(2) Prep QC Batch: MP13172



4.2



Client Sample ID: Lab Sample ID: Matrix: Project:	SW-A9(0 JC84633- SO - Soil PPG Site	.0-0.5) 2A 107, 18 Cha	pel Avenue,	Jersey Cit	y, NJ	Date Sampled: Date Received Percent Solids	: 03, : 03, : 78	/18/19 /18/19 .7
General Chemistry								
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivaler	nt <sup>a</sup>	94.5	1.8	mg/kg	1	04/01/19 13:47	RI	SW846 6010/7196A M

Page 1 of 1

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





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 <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	34.0	1.4	mg/kg	1	03/18/19	03/19/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	40.6	5.7	mg/kg	1	03/18/19	03/19/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>
Thallium	< 1.4	1.4	mg/kg	1	03/18/19	03/19/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>
Vanadium	38.0	7.2	mg/kg	1	03/18/19	03/19/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA46328

(2) Prep QC Batch: MP13172



4.3 **4** 



Client Sample ID: Lab Sample ID: Matrix: Project: General Chemistry	SW-A9(2 JC84633- SO - Soil PPG Site	2.0-2.5) 3A 107, 18 Cha	apel Avenue,	Jersey Cit	y, NJ	Date Sampled Date Received Percent Solids	: 03 : 03 : 68	/18/19 /18/19 .5
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivaler	nt <sup>a</sup>	32.4	2.0	mg/kg	1	04/01/19 13:47	RI	SW846 6010/7196A M

Page 1 of 1





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
		<b>Percent Solids:</b>	83.8
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

# **Report of Analysis**

#### **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 <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	33.8	1.1	mg/kg	1	03/18/19	03/19/19 GT	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	17.2	4.6	mg/kg	1	03/18/19	03/19/19 GT	SW846 6010D 1	SW846 3050B <sup>2</sup>
Thallium	< 1.1	1.1	mg/kg	1	03/18/19	03/19/19 GT	SW846 6010D 1	SW846 3050B <sup>2</sup>
Vanadium	31.1	5.7	mg/kg	1	03/18/19	03/19/19 GT	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA46330

(2) Prep QC Batch: MP13172







Client Sample ID: Lab Sample ID: Matrix: Project:	SW-A9(4 JC84633- SO - Soil PPG Site	.0-4.5) 4A 107, 18 Cha	apel Avenue,	, Jersey Cit	y, NJ	Date Sampled Date Received Percent Solids	03 03 83	/18/19 /18/19 .8
General Chemistry	,							
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivaler	nt <sup>a</sup>	27.8	1.6	mg/kg	1	04/01/19 13:47	RI	SW846 6010/7196A M

Page 1 of 1





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		

# **Report of Analysis**

#### **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 <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	55.7	1.2	mg/kg	1	03/18/19	03/19/19 GT	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	21.5	4.7	mg/kg	1	03/18/19	03/19/19 GT	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Thallium	< 1.2	1.2	mg/kg	1	03/18/19	03/19/19 GT	SW846 6010D 1	SW846 3050B <sup>2</sup>
Vanadium	34.6	5.8	mg/kg	1	03/18/19	03/19/19 GT	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA46330

(2) Prep QC Batch: MP13172



4.5 **4** 



Client Sample ID: Lab Sample ID: Matrix: Project:	SW-A9(5 JC84633- SO - Soil PPG Site	.5-6.0) 5A 107, 18 Chaj	pel Avenue,	Jersey City	y, NJ	Date Sampled: Date Received Percent Solids	03/ 03/ 85	/18/19 /18/19 .5
General Chemistry								
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivaler	nt <sup>a</sup>	54.0	1.7	mg/kg	1	04/01/19 13:42	RI	SW846 6010/7196A M

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

4.5



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
		<b>Percent Solids:</b>	84.2
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

# **Report of Analysis**

#### **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 <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	36.4	1.2	mg/kg	1	03/18/19	03/19/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	15.2	4.9	mg/kg	1	03/18/19	03/19/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>
Thallium	< 1.2	1.2	mg/kg	1	03/18/19	03/19/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>
Vanadium	31.7	6.1	mg/kg	1	03/18/19	03/19/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA46328

(2) Prep QC Batch: MP13172







Client Sample ID: Lab Sample ID: Matrix: Project: General Chemistry	SW-A10( JC84633- SO - Soil PPG Site	4.0-4.5) 6A 107, 18 Cha	npel Avenue,	Jersey Cit	y, NJ	Date Sampled: Date Received Percent Solids	: 03 : 03 : 84	/18/19 /18/19 .2
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivaler	nt <sup>a</sup>	36.0	1.7	mg/kg	1	04/01/19 13:47	RI	SW846 6010/7196A M

Page 1 of 1





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
		<b>Percent Solids:</b>	78.0
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

# **Report of Analysis**

#### **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 <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	23.9	1.2	mg/kg	1	03/18/19	03/19/19 GT	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	20.0	5.0	mg/kg	1	03/18/19	03/19/19 GT	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Thallium	< 1.2	1.2	mg/kg	1	03/18/19	03/19/19 GT	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Vanadium	35.7	6.2	mg/kg	1	03/18/19	03/19/19 GT	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA46330

(2) Prep QC Batch: MP13172



4.7 4



21 of 196

General Chemistry	Client Sample ID: Lab Sample ID: Matrix: Project:	SW-A100 JC84633- SO - Soil PPG Site	6.0-6.5) 7A 107, 18 Cha	apel Avenue,	Jersey Cit	y, NJ	Date Sampled Date Received Percent Solids	: 03, : 03, : 78	/18/19 /18/19 .0
	General Chemistry				•			_	
	Chromium, Trivaler	nt <sup>a</sup>	23.0	1.7	mg/kg	1	04/01/19 13:47	RI	SW846 6010/7196A M

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

4.7



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		

# **Report of Analysis**

#### **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 <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	17.7	1.3	mg/kg	1	03/18/19	03/19/19 GT	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	15.1	5.1	mg/kg	1	03/18/19	03/19/19 GT	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Thallium	< 1.3	1.3	mg/kg	1	03/18/19	03/19/19 GT	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Vanadium	21.1	6.4	mg/kg	1	03/18/19	03/19/19 GT	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA46330

(2) Prep QC Batch: MP13172



4.8



Client Sample ID: Lab Sample ID: Matrix: Project:	SW-A10( JC84633- SO - Soil PPG Site	7.5-8.0) 8A 107, 18 Cha	npel Avenue,	Jersey Cit	y, NJ	Date Sampled Date Received Percent Solids	: 03, : 03, : 79	/18/19 /18/19 .7
General Chemistry	7							
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivaler	nt <sup>a</sup>	16.4	1.8	mg/kg	1	04/01/19 13:47	RI	SW846 6010/7196A M







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-	Client / Reporting Information	Desired Marrie		Projec	t Inform	ation		_		_		_							Reque	sted A	nalysis	, · · · · ·	- -			Matrix Codes	
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- 10	Friend Land	18 0	hopel A	ve.	Billing In	formatic	n (if diffe	rent from	Repo	rt to)				~		1	1	1		1		1			1	SW - Surface Water SO - Soil	
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Project	Contact, E-mail	Project #	rcig	LN.	Street Ad	dress				-						È	して	5								OI - Oil LIQ - Other Liquid	
Kr	why mistorda	NPOOD	70.0001		01					Pinte			7.			5	X									AIR - Air SOL - Other Solid	
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Sample	r(s) Name(s) Pho	ne # Project Mana	ger		Attention:											1 2		1 3	* -	5 5	12	1				EB-Equipment Blank RB - Rinse Blank	
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										-			ž T	N.	10	1.5				4	ी <b>रे</b>						
SGS Sample #	Field ID / Point of Collection	MEOH/DI Vial #	Date	Time	Sampled by	Grab (G) Comp (C)	Matrix	# of bottles	옃	ŝ	NH S	NON	DI Wa	ENC	1	F	1~		4 <		11	1				LAB USE ONLY	
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2	(W-A59 (0.0 -0.	-)	abe la	1370	G	6	10	1				1		T	v	X	X	X	X	X	Y					MS	
3	SW-A58 12.0-2.5	j l	2/26/18	1175	G	4	50					i		T	5	X	X	X	X	x	X	-			_	024	
ų.	SH-ATA 14.0-4.5	)	7/26/10	1740	G	6	No		$\square$			ì		Ħ	x	Ŷ	X	x	X	x	X	<u> </u>			-		
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		Approved By (	SGS PM): / Date:			Com	nercial "A	A" (Level	1)	[		NYAS	P Cate	igory A			DOD	-QSM5									
	10 Business Days					Com	mercial "E	B" (Level 3	2)	L	╡`	NYAS	P Cate	gory B Iaria													
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C	2 Business Days					Com	mercial "C	<b>2</b> *		Č	5	State	Forms	_													
	1 Business Day					NJ DI	KQP			Ē	<u>ا</u>	EOD F	ormat	20	m)												
_	All data available via Lablink	Approval needed f	or 1-3 Business	Day TAT			Com	mercial " Commerci	a" = Re al "C"	= Resu	its + Q	C Sur	mmary	B" = Re + Partia	isults + Q0 il Raw data	: Summa I	ary				htt	p://ww	w.sgs.c	:om/en/	terms	-and-conditions	
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5.2

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JC85175: Chain of Custody Page 1 of 3



SGS

Client Sample ID: Lab Sample ID: Matrix:	FB(20190326) JC85175-1 AQ - Field Blank Soi!	l			Date Samp Date Receiv	led: 03	/26/19 /26/19	
Project:	PPG Site 107, 18 Cha	apel Avenu	e, Jersey Ci	ty, NJ	Percent Sol		4	
General Chemistry	7							
Analyte	Result	RL	Units	DF	Analyzed	By	Method	

## **Report of Analysis**

Page 1 of 1

4.1 **4** 

Chromium, Hexavalent	< 0.010	0.010	mg/l	1	03/26/19 23:10 јо	SW846 7196A
Redox Potential Vs H2	472		mv	1	03/29/19 20:30 EE	ASTM D1498-76
pH <sup>a</sup>	4.48		su	1	03/26/19 19:17 AS	SM4500H+ B-11

(a) Sample received out of holding time for pH 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		

# **Report of Analysis**

### **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

### Page 1 of 1

4.2



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
		<b>Percent Solids:</b>	82.5
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		
			,

# **Report of Analysis**

### **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

### Page 1 of 1

4.3



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		
a			,

# **Report of Analysis**

### **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

### Page 1 of 1

4.4

4



JC85175

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		

# **Report of Analysis**

### **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

### Page 1 of 1

4.5



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		

# **Report of Analysis**

#### **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

### Page 1 of 1

4.6



Matrix: Project:	SO - Soll PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	Date Received: Percent Solids:	93.0	
Client Sample ID: Lab Sample ID:	107_D019 JC85175-7	Date Sampled:	03/26/19	

#### 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

### Page 1 of 1

4.7



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		

# **Report of Analysis**

### **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 <sup>1</sup>	SW846 3010A <sup>2</sup>
Chromium	< 10	10	ug/l	1	03/27/19	03/27/19 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>
Nickel	< 10	10	ug/l	1	03/27/19	03/27/19 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>
Thallium	< 10	10	ug/l	1	03/27/19	03/27/19 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>
Vanadium	< 50	50	ug/l	1	03/27/19	03/27/19 ND	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA46374

(2) Prep QC Batch: MP13520







Client Sample ID: Lab Sample ID: Matrix: Project:	FB(20190 JC85175- AQ - Fiel PPG Site	326) 1A d Blank Soil 107, 18 Cha <sub>l</sub>	pel Avenue,	Jersey Cit	y, NJ	Date Sampled Date Received Percent Solids	: 03. : 03. : n/a	/26/19 /26/19 a
General Chemistry								
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivaler	nt <sup>a</sup>	< 0.020	0.020	mg/l	1	03/27/19 16:55	ND	SW846 6010/7196A M

### **Report of Analysis**

Page 1 of 1





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
		<b>Percent Solids:</b>	82.3
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

# **Report of Analysis**

#### **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 <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	111	1.2	mg/kg	1	03/26/19	03/27/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	25.3	4.7	mg/kg	1	03/26/19	03/27/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Thallium	< 1.2	1.2	mg/kg	1	03/26/19	03/27/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Vanadium	30.8	5.9	mg/kg	1	03/26/19	03/27/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA46374

(2) Prep QC Batch: MP13519



4.2



Client Sample ID: Lab Sample ID: Matrix: Project: General Chemistry	SW-A58( JC85175- SO - Soil PPG Site	0.0-0.5) 2A 107, 18 Cha	pel Avenue,	Jersey City	7, NJ	Date Sampled Date Received Percent Solids	: 03. : 03. : 82	/26/19 /26/19 .3
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivaler	nt <sup>a</sup>	74.3	1.7	mg/kg	1	04/02/19 12:51	RI	SW846 6010/7196A M

Page 1 of 1





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		

# **Report of Analysis**

**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 <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	17.4	1.2	mg/kg	1	03/26/19	03/27/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	15.9	4.9	mg/kg	1	03/26/19	03/27/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Thallium	< 1.2	1.2	mg/kg	1	03/26/19	03/27/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Vanadium	24.8	6.2	mg/kg	1	03/26/19	03/27/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA46374

(2) Prep QC Batch: MP13519



4.3 4



Client Sample ID: Lab Sample ID: Matrix: Project:	SW-A58(2.0-2.5)Date SamJC85175-3ADate SamSO - SoilDate RecoPPG Site 107, 18 Chapel Avenue, Jersey City, NJ							/26/19 /26/19 .5	
General Chemistry									
Analyte		Result	RL	Units	DF	Analyzed	By	Method	
Chromium, Trivaler	nt <sup>a</sup>	17.4	1.7	mg/kg	1	04/02/19 12:51	RI	SW846 6010/7196A M	

Page 1 of 1

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



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		

# **Report of Analysis**

**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 <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	15.5	1.1	mg/kg	1	03/26/19	03/27/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	14.0	4.4	mg/kg	1	03/26/19	03/27/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>
Thallium	< 1.1	1.1	mg/kg	1	03/26/19	03/27/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Vanadium	22.1	5.5	mg/kg	1	03/26/19	03/27/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA46374

(2) Prep QC Batch: MP13519



4.4 **4** 



Client Sample ID: Lab Sample ID: Matrix: Project:	SW-A58(4.0-4.5)Date SatJC85175-4ADate SatSO - SoilDate RePPG Site 107, 18 Chapel Avenue, Jersey City, NJ							/26/19 /26/19 .4
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivaler	nt <sup>a</sup>	15.5	1.5	mg/kg	1	04/02/19 12:43	RI	SW846 6010/7196A M

Page 1 of 1

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





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		

# **Report of Analysis**

#### **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 <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	14.4	1.2	mg/kg	1	03/26/19	03/27/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	12.2	4.7	mg/kg	1	03/26/19	03/27/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Thallium	< 1.2	1.2	mg/kg	1	03/26/19	03/27/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Vanadium	23.1	5.9	mg/kg	1	03/26/19	03/27/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA46374

(2) Prep QC Batch: MP13519



4.5 **4** 

Client Sample ID: Lab Sample ID: Matrix: Project: General Chemistry	SW-A58( JC85175- SO - Soil PPG Site	5.0-5.5) 5A 107, 18 Cha	ipel Avenue,	Date Sampled Date Received Percent Solids	: 03 : 03 : 86	/26/19 /26/19 .2		
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivaler	nt <sup>a</sup>	14.4	1.7	mg/kg	1	04/02/19 12:51	RI	SW846 6010/7196A M

Page 1 of 1




#### SGS LabLink@1045417 08:54 10-Jul-2019

Client Sample ID:	BS-J5		
Lab Sample ID:	JC85175-6A	Date Sampled:	03/26/19
Matrix:	SO - Soil	Date Received:	03/26/19
		<b>Percent Solids:</b>	89.5
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

# **Report of Analysis**

**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 <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	25.3	1.1	mg/kg	1	03/26/19	03/27/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	20.5	4.3	mg/kg	1	03/26/19	03/27/19 ND	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Thallium	< 1.1	1.1	mg/kg	1	03/26/19	03/27/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>
Vanadium	27.8	5.4	mg/kg	1	03/26/19	03/27/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA46374

(2) Prep QC Batch: MP13519



4.6 **4** 



			Repo	ort of An	alysis			Page 1 of 1
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 Ch	apel Avenue	e, Jersey Cit	y, NJ			
General Chemistry	7							
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivaler	nt <sup>a</sup>	24.7	1.6	mg/kg	1	04/02/19 12:51	RI	SW846 6010/7196A M

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





Client Sample ID:	107_D019		
Lab Sample ID:	JC85175-7A	Date Sampled:	03/26/19
Matrix:	SO - Soil	Date Received:	03/26/19
		<b>Percent Solids:</b>	93.0
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

# **Report of Analysis**

**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 <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	10.5	1.1	mg/kg	1	03/26/19	03/27/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>
Nickel	10.7	4.3	mg/kg	1	03/26/19	03/27/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>
Thallium	< 1.1	1.1	mg/kg	1	03/26/19	03/27/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>
Vanadium	15.8	5.4	mg/kg	1	03/26/19	03/27/19 ND	SW846 6010D 1	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA46374

(2) Prep QC Batch: MP13519



4.7 4



Client Sample ID: Lab Sample ID: Matrix: Project:	107_D019 JC85175- SO - Soil PPG Site	9 7A 107, 18 Cha	pel Avenue,	Jersey Cit	y, NJ	Date Sampled Date Received Percent Solids	: 03 : 03 : 93	/26/19 /26/19 .0
General Chemistry								
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivaler	nt <sup>a</sup>	10.5	1.5	mg/kg	1	04/02/19 12:51	RI	SW846 6010/7196A M

**Report of Analysis** 

Page 1 of 1

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







**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		A		Analysis		
Sample ID	Lab ID	Matrix	Collection Date	Parent Sample	Cr VI	MET	MISC		
FB(20190905)	JC94441-1	Water	9/5/2019		X	Х	Х		
BS-F26	JC94441-2	Soil	9/5/2019		x	Х	Х		
SW-A34(0.0-0.5)	JC94441-3	Soil	9/5/2019		X	Х	Х		
SW-A34(2.0-2.5)	JC94441-4	Soil	9/5/2019		x	Х	Х		
SW-A35(0.0-0.5)	JC94441-5	Soil	9/5/2019		x	Х	х		
SW-A35(2.0-2.5)	JC94441-6	Soil	9/5/2019		x	Х	Х		
SW-A35(4.0-4.5)	JC94441-7	Soil	9/5/2019		x	Х	Х		
SW-A35(6.0-6.5)	JC94441-8	Soil	9/5/2019		x	Х	Х		
SW-A35(8.0-8.5)	JC94441-9	Soil	9/5/2019		x	Х	Х		
SW-A35(10.0-10.5)	JC94441-10	Soil	9/5/2019		x	Х	Х		
SW-A36(0.0-0.5)	JC94441-11	Soil	9/5/2019		x	Х	Х		
SW-A36(2.0-2.5)	JC94441-12	Soil	9/5/2019		X	Х	Х		
SW-A36(4.0-4.5)	JC94441-13	Soil	9/5/2019		x	Х	Х		
SW-A36(6.0-6.5)	JC94441-14	Soil	9/5/2019		X	Х	Х		
SW-A36(8.0-8.5)	JC94441-15	Soil	9/5/2019		Х	Х	Х		
DUP-33(20190905)	JC94441-16	Soil	9/5/2019	SW-A36(12.0-12.5)	X	Х	Х		
SW-A36(10.0-10.5)	JC94441-17	Soil	9/5/2019		Х	Х	Х		
SW-A36(12.0-12.5)	JC94441-18	Soil	9/5/2019		X	Х	Х		

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.

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

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
	Water	180 days from collection to analysis	Preserved to a pH of less than 2; Cool to <6°C
SW-846 6010C	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
	Non-detect	UJ-
MS/MSD percent recovery 30% to 74%	Detect	J-
NO/NOT	Non-detect	R
MS/MSD percent recovery < 30%	Detect	J-
	Non-detect	No Action
MS/MSD percent recovery > 125%	Detect	J+

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#### 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  $\pm$  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.

Sample ID/Duplicate ID	Analyte	Sample Result	Duplicate Result	RPD
	Chromium	62.8	61.4	2.3%
	Nickel	18.8	20.0	AC
SW-A36(12.0-12.5) / DUP-33(20190905)	Vanadium	28.5	37.2	AC
	Chromium, Trivalent	58.5	57.7	1.4%

Results for duplicate samples are summarized in the following table.

<u>Notes</u>

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		orted	Performance Acceptable		Not
	No	Yes	No	Yes	Required
Inductively Coupled Plasma-Atomic Emission Spectromet	ry (ICP-AE	ES)			
Inductively Coupled Plasma-Mass Spectrometry (ICP-MS	)				
Tier II Validation					
Holding Times		X		Х	
Reporting limits (units)		X		X	
Blanks	1			1	
A. Instrument Blanks		X		Х	
B. Method Blanks		X		Х	
C. Equipment/Field Blanks		x		X	
Laboratory Control Sample (LCS)		x		x	
Laboratory Control Sample Duplicate (LCSD)	Х				Х
LCS/LCSD Precision (RPD)	Х				Х
Matrix Spike (MS) %R		x	x		
Matrix Spike Duplicate (MSD) %R		Х	Х		
MS/MSD Precision (RPD)		x		х	
Field/Lab Duplicate (RPD)		x		х	
ICP Serial Dilution %D		x		х	
Total vs. Dissolved	Х				Х
Reporting Limit Verification		Х		х	
Tier III Validation					
Initial Calibration Verification		Х		X	
Continuing Calibration Verification		Х		х	
CRDL Standard Recovery		Х		х	
ICP Interference Check		x		х	
ICP-MS Internal Standards		X		х	
Transcription/calculations acceptable		X		Х	
Raw Data	Х				Х
Reporting limits adjusted to reflect sample dilutions		Х		Х	
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 <sup>1</sup>
	Non-detect	UJ-
Spike recovery $\geq 50\%$ but $< 75\%$	Detect	J-
	Non-detect	R
Spike recovery < 50%	Detect	R
Spike recovery > 125%	Non-detect	No Action
Spike recovery > 125% but ≤ 150%	Detect	J+
Spike recovery > 150%	Detect	R

Notes:

<sup>1</sup> 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.

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

#### DATA VALIDATION CHECKLIST FOR HEXAVALENT CHROMIUM

%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)	SW846 9045D	Analysis: 4 days	< 24 hours of receipt by laboratory
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)			
BS-F26	ASTM D3872-86	Analysis: 27 days	< 24 hours from collection

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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.

	Qualification			
Criteria	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
	Redox Potential	360	368	2.2%
SW-A36(12.0-12.5) / DUP-33(20190905)	рН	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	Rep	orted	Performance Acceptable		Not Required		
9045D, ASTM D1498-76	No	Yes	No	Yes	Required		
Miscellaneous Instrumentation							
Tier II Validation							
Holding times		х	х				
Reporting limits (units)		х		Х			
Blanks							
A. Instrument Blanks		х		x			
B. Method blanks		х		x			
C. Equipment blanks		Х		Х			
Laboratory Control Sample (LCS) %R		Х		Х			
Laboratory Control Sample Duplicate (LCSD) %R	Х				Х		
LCS/LCSD Precision (RPD)	Х				Х		
Matrix Spike (MS) %R	Х				Х		
Matrix Spike Duplicate (MSD) %R	Х				Х		
MS/MSD Precision (RPD)	Х				Х		
Field/Lab Duplicate (RPD)		Х		Х			
Dilution Factor		Х		Х			
Tier III Validation	<u> </u>				·		
Initial calibration %RSD or correlation coefficient		Х		x			
Continuing calibration %R		Х		х			
Raw Data		X		Х			
Transcription/calculation errors present		Х		Х			
Reporting limits adjusted to reflect sample dilutions		Х		Х			

Notes:

%R Percent recovery

RPD Relative percent difference

VALIDATION PERFORMED BY: Jennifer Singer

SIGNATURE:

Annifer Ainger

DATE: October 11, 2019

PEER REVIEW: Dennis Capria

DATE: October 11, 2019

# CHAIN OF CUSTODY CORRECTED SAMPLE ANALYSIS DATA SHEETS



SGS	50 FB	CHAIN OF CUSTODY SGS North America Inc Dayton 233 Route 130, Dayton, NJ 08810	FED-EX Tracking # Bo	Page of (
I		TEL. 732-329-0200 FAX: 732-329-3499/3480 www.sgs.com/ehsusa	SGS Quote # SG	15 Job # TCG4441
Client / Reporting Information		Project Information	Requested Anal	ysis Matrix Codes
Compary James Store Jose Colored States Colored States Protectional PA 189448 Protectional E-mail Protectional E-mail Protectional E-mail Protectional E-mail Protectional E-mail Protectional E-mail Protectional E-mail Protectional E-mail Protectional E-mail Colored States Colored States Colored States Colored States Protectional E-mail Protectional E-mail Protectional E-mail Protectional E-mail Protectional E-mail Colored States Colored	Prove your Strate 18 Chapel A Sersey City I Persey City I Clerr Purchase Cited # Posted Manage	Step City Site 107 State Dilling Information (if different from Report to) Company Name UJ Sweet Address Sweet Address City State Zp Abertion	Chromium ant Chromium alext Chromium clear intory ion	COV - Oriving Water GW - Grow Water GW - Grow Water SW - Surface Water SW - Surface Water SW - Surface Water SU - Subject State LG - Other Load AR - Ar SOL - Other Sold WP - Woe PB - Field State. EB 19- Field State.
	Jim McLaugh		しててたいです	TB - Trip Blank
SGS Sample # Field 1D / Point of Collection	MEOH/OI Vial # Date	Sampled         Grab (G)         # of         T         T         Sampled         E         E         E         E         E         E         E         E         E         E         E         E         E         E         E         E         E         E         E         E         E         E         E         E         E         E         E         E         E         E         E         E         E         E         E         E         E         E         E         E         E         E         E         E         E         E         E         E         E         E         E         E         E         E         E         E         E         E         E         E         E         E         E         E         E         E         E         E         E         E         E         E         E         E         E         E         E         E         E         E         E         E         E         E         E         E         E         E         E         E         E         E         E         E         E         E         E         E         E         E	[1] [1] [1] [1] [1] [1] [1] [1] [1] [1]	
( FB(20190905)	9/5/19	DUYE OF GEB 2 111	XXXXXX	X PL
2 RS-FZ6	9/5/19/1	235 00 6 50 1	Y X X X X X	X hı3
3 SW-A34 (0.0-0.5)	9/5/19 0	ROO CC G SO I III	$\hat{\mathbf{x}} + \hat{\mathbf{x}} + \mathbf{$	X
Y SW-A34(2.0-2.5)	9/5/19 0	ratio cc g so i i i i	XXXXXXX	x
5 SW-A35(0,0-0,5)	9/5/19/1	110 CC G 10 1	XXXXXXX	X
6 SW-A35(210-2.5)	9/5/19	no cc G so I III	XXXXXXX	X
7 W-A35(4.0-4.5)	9/5/0 1	130 CC 9 80 1	XXXXXX	x
8 IW-A35 (6.0-6.5)	9/5/19	1140 CC G CO 1	XXXXXXX	x
9 SW-A35 (8.0-8.5)	9/5/19	USD CC G SO I	XXXXXXX	X
10 SW-A35(10.0-10.5)	9/5/19	100 CC G SO I	XXXXXX	x
11 SW-A36 (0.0 -0.5)	9/5/19 1	000 CC G SO 1 1	XXXXXXX	X
12 SW-A36 (2.0-2.5)	9/5/15 1	010 a 6 20 1 1	XXXXXXX	$\mathbf{x}$
Turn Around Time (B	usiness Days)	Deliverable		Comments / Special Instructions
10 Business Days	Approved By (SGS PM): / Date:	Commercial "A" (Level 1) NYASP Category A Commercial "B" (Level 2) NYASP Category B NJ Reduced (Level 3) MA MCP Criteria	DOD-QSM5	INITIAL ASESSMENT 4B DCM
3 Business Days'		Full Tier I (Level 4) CT RCP Criteria	_	COMENTATION ATION
2 Business Days"		Commercial "C" State Forms	illis I	
Other		Commercial "A" = Results only; Commercial "B" = Results	te + QC Summary	
All data available via Labilink Ap	proval needed for 1-3 Business Day Sample C	TAT Commercial "C" = Results + QC Summary + Partial	aw data	http://www.sgs.com/en/terms-and-conditions
Relinguished by: Addi 9/3	1327 Received By:		2 9519 2	celved By:
Relinquished by: Date / Ti	me: Received By:	Relinguised By:	Date / Time: Re	celved By:
Relinquished by: Date / Ti 5	ne: Received By:	Custody See 160-	Intact Preserved when applicable	
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EHSA-QAC-0023-02-FORM-Dayton - Standard COC.xisx

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JC94441: Chain of Custody Page 1 of 6



54 of 187 JC94441

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	363		SGS North A 2235 Route 1	America Inc Da 130, Dayton, NJ 08	ayton 810	FED-EX Tracking #	Bottle Order Control #	
		т	EL. 732-329-0200 www.s	0 FAX: 732-329-3 sgs.com/ehsusa	499/3480	SGS Quote #	SGS Job # JC	94441
	Client / Reporting Information	Project Name	roject Informatio	on		Reque	sted Analysis	Matrix Codes
	Arcadis Street Address	Project Names	rseg.	City Si	te 107	N) F		DW - Drinking Water GW - Ground Water WW - Water
	10 Friends Lane	- 18 chapel Are	Billing Inform	nation (if different fr <u>om f</u>	Report to)			SW - Surface Water SO - Soil
	Neutrun DA 18	940 Jersey City N	Street Address	s		445		SED-Sediment OI - Oil LIQ - Other Liquid
	Krista Mastracola	Client Purchase Order #	City		State Zip		272	AIR - Air SOL - Other Solid WP - Wipe
	(610 - 755 - 7080 Sampler(s) Name(s)	Phone # Project Manager	Attention:			e releve		FB - Field Blank EB-Equipment Blank RB - Rinse Blank TB - Trip Blank
		Jim recarghi	ollection		Number of preserved Bottles	ええ えをみ	B B	
	SGS Samon # Field ID / Point of Collection	MEOH/DI Viel # Date 1	Sampled Grat	b(G) # of p(C) Matrix bottles	HCI NaOH HNO, HySO, NONE DI Water MEOH ENCORE	ゆうえん	17	LAB USE ONLY
	13 SW - A36(4.0-4.	5) 1/5/19 10	120 CC @	i So I		XXXXX	X X	
	14 JW - A36 (6.0-6.	5) 9/5/19 10	30 CC @	a so i		XXXXX	XX	
6	15 JW-A76 (8.0-8.)	5) 9/5/19 10	740 CC 6	a so 1		XXXXX		
2/BS-126MS -	10-120(20-2.5	BS-FASHS 9/ 5/11 12	35 CC G	a SO I		XXXXX		
BS-F26 MID -		BS-F26My 9 15719 12	.35 CC 6	<u>a so i</u>				
C	16 DUP- 55 (20190905	$\frac{1}{2}$ $\frac{1}{2}$		1 50 1	<del>─┼┼┼<u>╿</u>╎┼┼</del>			
	11 SW - ASU (10.0 - 10.5)	-) 9/5/19 10		1 10 1	╾┼┼┼┼╬┼┼┼		XX	_
	18 JW - A JG (12.0 - 12.)		00 10 6	10 1	<del>─┼┼┼╹┤┼</del> ┽┼			
	Turn Around Ti	ime (Business Days)			Deliverable		Comments / Specia	Instructions
	10 Businese Days	Approved By (SGS PM): / Date:		Commercial "A" (Level 1 Commercial "B" (Level 2)	NYASP Category B	UDD-QSM5		
	5 Business Days		N 🗆 N	J Reduced (Level 3)	MA MCP Criteria	_		
	3 Business Days			full Tier I (Level 4)	CT RCP Criteria_	-		
	1 Business Days			IJ DKQP		aus		×.
	Other	Annual needed for 1.2 Burings Day 1		Commercial "A	" = Results only: Commercial "B" = Re	suits + QC Summary Rew deta	/http://www.sgs.com/er	/terms-and-conditions
		Sample Cus	tody must be docu	mented below each til	ne samples change possession, in	etudipercourier delivery.		
	1 a dar	9/5/19 1 LA	-U/V	$\sim$	2 5 1	6 7579	2	>
	Relinquished by:	Date / Time: Received By	1		Relingentined By:	Date / Time:	Received By: 4	
	Relinquished by: 5	Date / Time: Received By.	-0-		Custody Seal #944	Intact Preserved where applicat Not intact Absent	Ne On Ice	Dect Tomp. CC
	· · · · · · · · · · · · · · · · · · ·				and an angle of the second		Å	-1

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JC94441: Chain of Custody Page 2 of 6



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#### SGS LabLink@1054376 15:17 10-Oct-2019

General Chemistry	<i>Y</i>							
Project:	PPG Site 107, 18 Cha	pel Avenue	e, Jersey Cit	y, NJ	i ci cent bonu	<b>5.</b> 17 a		
Client Sample ID: Lab Sample ID: Matrix:	FB(20190905) JC94441-1 AQ - Field Blank Soil				Date Sampled Date Received Percent Solid	<b>1:</b> 09/ <b>d:</b> 09/ <b>s:</b> n/a	/05/19 /05/19	

### **Report of Analysis**

< 0.010 0.010 Chromium, Hexavalent 09/05/19 23:24 ев mg/l 1 SW846 7196A Redox Potential Vs H2 328 09/09/19 14:43 MS 1 mv ASTM D1498-76 pH <sup>a</sup> 5.49 1 09/04/19 17:20 AS su SM4500H+ B-11 (a) Sample received out of holding time for pH analysis.



4



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		

# **Report of Analysis**

#### **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

#### Page 1 of 1

4.2

4



		Repo	rt of An	alysis	Page 1 of 1
Client Sample ID:	BS-F26				Date Sampled: 09/05/19
Matrix:	SO - Soil				Date Received: 09/05/19 Percent Solids: 87.0
Project:	PPG Site 107, 18 Cha	apel Avenue	, Jersey Cit	y, NJ	
General Chemistr	у				
Analyte	Result	RL	Units	DF	Analyzed By Method
Chromium, Hexav	alent 1.1	0.46	mg/kg	1	09/20/19 22:26 EB SW846 3060A/7196A



Analyta	Docult	DT	Unite	DE	Analyzad	D.	Mathad	
General Chemistry	7							
Project:	PPG Site 107, 18 Cha	apel Avenue	e, Jersey Cit	y, NJ				
Matrix:	SO - Soil				Date Receiv Percent Sol	ed: 09 ids: 87	//05/19 /.0	
Lab Sample ID:	JC94441-2RT				Date Sampl	ed: 09	/05/19	
Client Sample ID:	BS-F26							

1

1

10/02/19 12:44 MP

10/02/19 12:44 MP

09/25/19 14:56 CD

#### **Report of Analysis**

Page 1 of 1

ASTM D3872-86

-SM4500S2- A-11 R

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.

%

mg/kg

0.20

110

0.77 J

1350 J

NEGATIVE

(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.

Iron, Ferrous <sup>a</sup>

Sulfide Screen h

Total Organic Carbon c





#### SGS LabLink@1054376 15:17 10-Oct-2019

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		
a			

# **Report of Analysis**

#### 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 <mark>J</mark>		su	1	09/09/19 11:46	MS	SW846 9045D

#### Page 1 of 1

4.5

4



		Repo	rt of An	alysis	Page 1 of 1
Client Sample ID:	SW-A34(0.0-0.5)				
Lab Sample ID:	JC94441-3R				<b>Date Sampled:</b> 09/05/19
Matrix:	SO - Soil				<b>Date Received:</b> 09/05/19
		_			Percent Solids: 94.5
Project:	PPG Site 107, 18 Cha	pel Avenue	e, Jersey Cit	y, NJ	
General Chemistry					
Analyte	Result	RL	Units	DF	Analyzed By Method
Chromium, Hexavale	ent 1.4	0.42	mg/kg	1	09/20/19 22:40 EB SW846 3060A/7196A



4.6 **4** 

#### SGS LabLink@1054376 15:17 10-Oct-2019

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		

# **Report of Analysis**

#### **General Chemistry**

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	3.3 <b>J-</b>	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

#### Page 1 of 1

4.7

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		Repo	rt of An	alysis		Page 1 of 1
Client Sample ID: SW	-A34(2.0-2.5)					
Lab Sample ID: JC9	94441-4R				<b>Date Sampled:</b> 09/05/19	
Matrix: SO	- Soil				<b>Date Received:</b> 09/05/19	
		_			Percent Solids: 80.0	
Project: PPO	G Site 107, 18 Cha	apel Avenue	, Jersey Cit	y, NJ		
General Chemistry						
Analyte	Result	RL	Units	DF	Analyzed By Meth	od



4.8

#### SGS LabLink@1054376 15:17 10-Oct-2019

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		
C			

# **Report of Analysis**

#### **General Chemistry**

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	4.4 <b>J-</b>	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 <mark>J</mark>		su	1	09/09/19 11:51	MS	SW846 9045D

#### Page 1 of 1

4.9

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SGS

		Repo	rt of An	alysis	Page 1 of 1	
Client Sample ID:	SW-A35(0.0-0.5)				Data Samplade 00/05/10	4.1
Matrix:	SO - Soil	_			Date Sampled: 09/05/19 Date Received: 09/05/19 Percent Solids: 96 4	0
Project:	PPG Site 107, 18 Cha	apel Avenue	, Jersey Cit	y, NJ	Tercent Jonus. 90.4	4
General Chemistry	y					
Analyte	Result	RL	Units	DF	Analyzed By Method	
Chromium, Hexava	alent 0.98	0.41	mg/kg	1	09/20/19 22:40 EB SW846 3060A/7196A	
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					

# **Report of Analysis**

#### **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 <mark>J</mark>		su	1	09/09/19 11:52	MS	SW846 9045D

## Page 1 of 1

4.11 **4** 



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			Repor	rt of An	alysis	Page 1 of 1
Client Sample ID: Lab Sample ID: Matrix:	SW-A35( JC94441- SO - Soil	(2.0-2.5) -6R				Date Sampled: 09/05/19 Date Received: 09/05/19
Project:	PPG Site	107, 18 Ch	apel Avenue.	Jersey Cit	y, NJ	Percent Solids: 94.7
General Chemistry	7					
Analyte		Result	RL	Units	DF	Analyzed By Method
Chromium, Hexava	lent	11.8	0.42	mg/kg	1	09/20/19 22:40 EB SW846 3060A/7196A



4.12

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
		<b>Percent Solids:</b>	89.2
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

# **Report of Analysis**

## **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

## Page 1 of 1

4.13



		Repo	rt of An	alysis	Page 1 of 1
Client Sample ID:	SW-A35(4.0-4.5)				
Lab Sample ID:	<b>IC</b> 94441-7R				<b>Date Sampled:</b> 09/05/19
Matrix:	SO - Soit				<b>Date Received:</b> 09/05/19
					Percent Solids: 89.2
Project:	PPG Site 107, 18 Ch	apel Avenue	, Jersey Cit	y, NJ	
General Chemistry					
Analyte	Result	RL	Units	DF	Analyzed By Method
Chromium, Hexavale	nt 3.6	0.45	mg/kg	1	09/20/19 22:40 ЕВ SW846 3060А/7196А



4.14 4

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		

# **Report of Analysis**

#### **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

## Page 1 of 1





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~		Repo	rt of An	alysis	Page 1 of 1
Client Sample ID: SW-A	35(6.0-6.5)				
Lab Sample ID: JC944	41-8R				<b>Date Sampled:</b> 09/05/19
Matrix: SO - S	oil				<b>Date Received:</b> 09/05/19
					Percent Solids: 96.0
Project: PPG S	lite 107, 18 Cha	pel Avenue	, Jersey Cit	y, 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



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		

# **Report of Analysis**

#### **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

## Page 1 of 1

4.17 4





		Repo	rt of An	alysis		Page 1 of 1
Client Sample ID:	SW-A35(8.0-8.5)					
Lab Sample ID:	JC94441-9R				<b>Date Sampled:</b> 09/05/19	
Matrix:	SO - Soil				<b>Date Received:</b> 09/05/19	
					Percent Solids: 94.3	
Project:	PPG Site 107, 18 Ch	apel Avenue	, Jersey Cit	y, NJ		
General Chemistry	7					
Analyte	Result	RL	Units	DF	Analyzed By Metho	bd
Chromium, Hexava	lent 0.44	0.42	mg/kg	1	09/20/19 22:40 EB SW846	3060A/7196A



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
		<b>Percent Solids:</b>	93.2
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

# **Report of Analysis**

## **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

## Page 1 of 1

4.19



_	Report of Analysis								
Client Sample ID: SW-A	A35(10.0-10.5)								
Lab Sample ID: JC94	441-10R				<b>Date Sampled:</b> 09/05/19				
Matrix: SO -	Soil				<b>Date Received:</b> 09/05/19				
		_			Percent Solids: 93.2				
Project: PPG	Site 107, 18 Cha	apel Avenue	, Jersey Cit	y, NJ					
General Chemistry					<b>~</b>				
Analyte	Result	RL	Units	DF	Analyzed By Meth	nod			
Chromium, Hexavalent	2.9	0.43	mg/kg	1	09/20/19 22:40 EB SW84	6 3060A/7196A			
			0						





4.20 4

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		

# **Report of Analysis**

#### 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

## Page 1 of 1

4.21 **4** 



~		Repo	rt of An	alysis	Page 1 of 1
Client Sample ID: SW Lab Sample ID: JC	V-A36(0.0-0.5) 94441-11R				<b>Date Sampled:</b> 09/05/19
Matrix: SC	) - Soil				Date Received: 09/05/19 Percent Solids: 94.3
Project: PP	G Site 107, 18 Cha	pel Avenue	, Jersey Cit	y, 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



37 of 187

JC94441

4.22

<b>Client Sample ID:</b>	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		

# **Report of Analysis**

#### **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

## Page 1 of 1

4.23



		Repo	rt of An	alysis	Page 1 of 1
Client Sample ID:	SW-A36(2.0-2.5)				
Lab Sample ID:	JC94441-12R				<b>Date Sampled:</b> 09/05/19
Matrix:	SO - Soil				<b>Date Received:</b> 09/05/19
					Percent Solids: 93.3
Project:	PPG Site 107, 18 C	hapel Avenue	Jersey Cit	y, NJ	
General Chemistry	,				
Analyte	Result	RL	Units	DF	Analyzed By Method
Chromium, Hexava	lent 1.3	0.43	mg/kg	1	09/20/19 22:40 EB SW846 3060A/7196A

4.24 4



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		

# **Report of Analysis**

#### **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

## Page 1 of 1

4.25 **4** 



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			Repo	rt of An	alysis	Ι	Page 1 of 1
Client Sample ID: Lab Sample ID:	SW-A36(4	.0-4.5) 3R				Date Sampled: 09/05/19	
Matrix:	SO - Soil					<b>Date Received:</b> 09/05/19	
Project:	PPG Site 1	07, 18 Cha	pel Avenue	, Jersey Cit	y, NJ	Percent Solids: 92.3	
General Chemistry	у						
Analyte		Result	RL	Units	DF	Analyzed By Method	
Chromium, Hexava	alent	2.6	0.43	mg/kg	1	09/20/19 23:10 ЕВ 5\\846 30	60A/7196A



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
		<b>Percent Solids:</b>	95.7
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		
			]

# **Report of Analysis**

## **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

## Page 1 of 1

4.27 4



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		Repo	rt of An	alysis	Page 1 of 1
Client Sample ID:	SW-A36(6.0-6.5)				Date Sampled: 00/05/10
Matrix:	SO - Soil				Date Received: 09/05/19
Project:	PPG Site 107, 18 Ch	apel Avenue	, Jersey Cit	y, NJ	Percent Solids: 95.7
General Chemistry	7				
Analyte	Result	RL	Units	DF	Analyzed By Method
Chromium, Hexava	lent 2.7	0.42	mg/kg	1	09/20/19 23:10 EB SW846 3060A/7196A



4.28

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
		<b>Percent Solids:</b>	86.6
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

# **Report of Analysis**

#### **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



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			керо	ct of An	alysis			Page 1 of 1
Client Sample ID:	SW-A36(8.	0-8.5)						
Lab Sample ID:	JC94441-15	R				Date Sampled:	09/05/19	
Matrix:	SO - Soil					Date Received:	09/05/19	
						Percent Solids:	86.6	
Project:	PPG Site 10	07, 18 Chape	el Avenue,	Jersey City	y, NJ			
General Chemistry	y							
Analyte	F	Result	RL	Units	DF	Analyzed	By Metho	od
Chromium, Hexava	alent 3	.9	0.46	mg/kg	1	09/20/19 23:10 H	EB SW846	3060A/7196A



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		

# **Report of Analysis**

## **General Chemistry**

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	3.7 <b>J-</b>	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

## Page 1 of 1

4.31 4

RL = Reporting Limit



_		Repo	rt of An	alysis	Page 1 of 1
Client Sample ID:	DUP-33(20190905)				
Lab Sample ID:	JC94441-16R				<b>Date Sampled:</b> 09/05/19
Matrix:	SO - Soil				<b>Date Received:</b> 09/05/19
					Percent Solids: 82.7
Project:	PPG Site 107, 18 Cl	napel Avenue	, Jersey Cit	y, NJ	
General Chemistry	,				
Analyte	Result	RL	Units	DF	Analyzed By Method
Chromium, Hexava	lent 2.0	0.48	mg/kg	1	09/20/19 23:10 EB SW846 3060A/7196A





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
		<b>Percent Solids:</b>	93.7
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

# **Report of Analysis**

## **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 1/: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

Page 1 of 1



		Repo	rt of An	alysis	Page 1 of 1	
Client Sample ID:	SW-A36(10.0-10.5)					
Lab Sample ID:	JC94441-17R				<b>Date Sampled:</b> 09/05/19	
Matrix:	SO - Soil				<b>Date Received:</b> 09/05/19	
					Percent Solids: 93.7	
Project:	PPG Site 107, 18 Ch	apel Avenue	Jersey Cit	y, NJ		
General Chemistry	ÿ					
Analyte	Result	RL	Units	DF	Analyzed By Method	
Chromium, Hexava	lent 1.2	0.43	mg/kg	1	09/20/19 23:10 EB SW846 3960A/7196A	



4.34

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
		<b>Percent Solids:</b>	81.1
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

# **Report of Analysis**

## **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

## Page 1 of 1

4.35 4





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	Report of Analysis									
Client Sample ID:	SW-A36(12.0-12.5)				<b>D</b> 4 G <b>L</b> 1 00/05/10	4.3				
Lab Sample ID:	JC94441-18K				Date Sampled: 09/05/19	ő				
Matrix:	50 - 5011				Date Received: 09/03/19 Porcont Solids: 81 1					
Project:	PPG Site 107, 18 Cl	napel Avenue	e, Jersey Cit	ty, NJ	recent sonus. 81.1					
General Chemistr	y									
Analyte	Result	RL	Units	DF	Analyzed By Method					
Chromium, Hexava	alent 0.83	0.49	mg/kg	1	09/20/19 23:10 EB SW846 30604/7196А					





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		

# **Report of Analysis**

## **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 <sup>1</sup>	SW846 3010A <sup>2</sup>
Chromium	< 10	10	ug/l	1	09/06/19	09/07/19 EAL	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>
Nickel	< 10	10	ug/l	1	09/06/19	09/07/19 EAL	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>
Thallium	< 10	10	ug/l	1	09/06/19	09/07/19 EAL	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>
Vanadium	< 50	50	ug/l	1	09/06/19	09/07/19 EAL	SW846 6010D <sup>1</sup>	SW846 3010A <sup>2</sup>

(1) Instrument QC Batch: MA47409

(2) Prep QC Batch: MP17164









Client Sample ID: Lab Sample ID: Matrix:	FB(20190 JC94441-	1905) 1A d Plank Soil	-			Date Sampled	: 09/	/05/19		
Project:	AQ - Fleid Blank Soli Date Received: 09/05/19   PPG Site 107, 18 Chapel Avenue, Jersey City, NJ Percent Solids: n/a									
General Chemistry										
Analyte		Result	RL	Units	DF	Analyzed	By	Method		
Chromium, Trivaler	nt <sup>a</sup>	< 0.020	0.020	mg/l	1	09/07/19 03:54	EAL	SW846 6010/7196A M		

## **Report of Analysis**

Page 1 of 1

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



Client Sample ID:	BS-F26		
Lab Sample ID:	JC94441-2A	Date Sampled:	09/05/19
Matrix:	SO - Soil	Date Received:	09/05/19
		<b>Percent Solids:</b>	87.0
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

## **Report of Analysis**

#### 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 <sup>2</sup>
Chromium	23.3	1.1	mg/kg	1	09/06/19	09/06/19 EAL	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	61.4	4.6	mg/kg	1	09/06/19	09/06/19 EAL	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Thallium	< 1.1	1.1	mg/kg	1	09/06/19	09/06/19 EAL	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Vanadium	22.6	5.7	mg/kg	1	09/06/19	09/06/19 EAL	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA47408

(2) Prep QC Batch: MP17170



4.2 **4** 



Client Sample ID: Lab Sample ID: Matrix: Project:	BS-F26 JC94441- SO - Soil PPG Site	-2A 107, 18 Cha	apel Avenue,	Jersey Cit	y, NJ	Date Sampled Date Received Percent Solids	: 09/ : 09/ : 87	/05/19 /05/19 .0
General Chemistry								
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivaler	nt <sup>a</sup>	22.8	1.6	mg/kg	1	09/06/19 18:26	EAL	SW846 6010/7196A M

# **Report of Analysis**

Page 1 of 1

4.2

4

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



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		

## **Report of Analysis**

#### 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 <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	54.1	1.0	mg/kg	1	09/06/19	09/06/19 EAL	SW846 6010D 1	SW846 3050B <sup>2</sup>
Nickel	26.5	4.1	mg/kg	1	09/06/19	09/06/19 EAL	SW846 6010D 1	SW846 3050B <sup>2</sup>
Thallium	< 1.0	1.0	mg/kg	1	09/06/19	09/06/19 EAL	SW846 6010D 1	SW846 3050B <sup>2</sup>
Vanadium	53.0	5.2	mg/kg	1	09/06/19	09/06/19 EAL	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA47408

(2) Prep QC Batch: MP17170



4.3 **4** 



Client Sample ID: Lab Sample ID: Matrix: Project:	SW-A34( JC94441- SO - Soil PPG Site	0.0-0.5) 3A 107, 18 Cha	npel Avenue	e, Jersey Cit	y, NJ	Date Sampled:09/05/19Date Received:09/05/19Percent Solids:94.5		
General Chemistry								
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivaler	nt <sup>a</sup>	46.8	1.4	mg/kg	1	09/06/19 18:35	EAL	SW846 6010/7196A M

# **Report of Analysis**

Page 1 of 1

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





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		

## **Report of Analysis**

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Antimony <sup>a</sup>	< 7.3 UJ-	7.3	mg/kg	3	09/06/19	09/06/19 EAL	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	1250	3.6	mg/kg	3	09/06/19	09/06/19 EAL	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	214	4.9	mg/kg	1	09/06/19	09/06/19 EAL	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Thallium <sup>a</sup>	< 3.6	3.6	mg/kg	3	09/06/19	09/06/19 EAL	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Vanadium <sup>a</sup>	416	18	mg/kg	3	09/06/19	09/06/19 EAL	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA47408

(2) Prep QC Batch: MP17170

(a) Elevated detection limit due to dilution required for high interfering element.

Page 1 of 1





Client Sample ID: Lab Sample ID: Matrix: Project:	SW-A34(2.0-2.5) JC94441-4A SO - Soil PPG Site 107, 18 Chapel Avenue, Jersey City, NJ					Date Sampled Date Received Percent Solids	: 09/ : 09/ : 80.	/05/19 /05/19 .0
General Chemistry								
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivaler	nt <sup>a</sup>	1250	4.1	mg/kg	1	09/06/19 21:15	EAL	SW846 6010/7196A M

# **Report of Analysis**

Page 1 of 1

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



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		

## **Report of Analysis**

#### 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 <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	122	1.0	mg/kg	1	09/06/19	09/06/19 EAL	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	38.7	4.1	mg/kg	1	09/06/19	09/06/19 EAL	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Thallium	< 1.0	1.0	mg/kg	1	09/06/19	09/06/19 EAL	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Vanadium	63.9	5.1	mg/kg	1	09/06/19	09/06/19 EAL	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA47408

(2) Prep QC Batch: MP17170

RL = Reporting Limit



4.5 **4** 



Client Sample ID: Lab Sample ID: Matrix: Project:	SW-A35( JC94441- SO - Soil PPG Site	0.0-0.5) 5A 107, 18 Chap	el Avenue,	Jersey City	, NJ	Date Sampled:09/05/19Date Received:09/05/19Percent Solids:96.4		
General Chemistry								
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivaler	nt <sup>a</sup>	118	1.4	mg/kg	1	09/06/19 18:46	EAL	SW846 6010/7196A M

# **Report of Analysis**

Page 1 of 1

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




-			
Lab Sample ID: JC94441-6A I	Date Sampled:	09/05/19	
Matrix: SO - Soil I	Date Received:	09/05/19	
I	Percent Solids:	94.7	
Project: PPG Site 107, 18 Chapel Avenue, Jersey City, NJ			

# **Report of Analysis**

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 <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	128	1.0	mg/kg	1	09/06/19	09/06/19 EAL	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	26.4	4.1	mg/kg	1	09/06/19	09/06/19 EAL	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Thallium	< 1.0	1.0	mg/kg	1	09/06/19	09/06/19 EAL	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Vanadium	42.0	5.1	mg/kg	1	09/06/19	09/06/19 EAL	SW846 6010D 1	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA47408

(2) Prep QC Batch: MP17170



4.6 **4** 



Client Sample ID: Lab Sample ID: Matrix: Project:	SW-A35(2.0-2.5) JC94441-6A Date Sampled: 09/05/19   SO - Soil Date Received: 09/05/19   PPG Site 107, 18 Chapel Avenue, Jersey City, NJ Percent Solids: 94.7								
General Chemistry									
Analyte		Result	RL	Units	DF	Analyzed	By	Method	
Chromium, Trivaler	nt <sup>a</sup>	121	1.4	mg/kg	1	09/06/19 18:51	EAL	SW846 6010/7196A M	

# **Report of Analysis**

Page 1 of 1



PPG She 107, 18 Chapel Avenue, Jersey City, NJ		
DDC Site 107 19 Changel Assessed Langers City, NL		
	Percent Solids:	89.2
SO - Soil	Date Received:	09/05/19
JC94441-7A	Date Sampled:	09/05/19
SW-A35(4.0-4.5)		
	SW-A35(4.0-4.5) JC94441-7A SO - Soil	SW-A35(4.0-4.5)Date Sampled:JC94441-7ADate Sampled:SO - SoilDate Received:Percent Solids:Percent Solids:

## **Report of Analysis**

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Antimony <sup>a</sup>	< 4.5 <mark>UJ-</mark>	4.5	mg/kg	2	09/06/19	09/09/19 GT	SW846 6010D <sup>2</sup>	SW846 3050B <sup>3</sup>
Chromium	661	1.1	mg/kg	1	09/06/19	09/06/19 EAL	SW846 6010D <sup>1</sup>	SW846 3050B <sup>3</sup>
Nickel	106	4.5	mg/kg	1	09/06/19	$09/06/19 \ \text{EAL}$	SW846 6010D <sup>1</sup>	SW846 3050B <sup>3</sup>
Thallium <sup>a</sup>	< 2.2	2.2	mg/kg	2	09/06/19	09/09/19 GT	SW846 6010D <sup>2</sup>	SW846 3050B <sup>3</sup>
Vanadium	187	5.6	mg/kg	1	09/06/19	09/06/19 EAL	SW846 6010D <sup>1</sup>	SW846 3050B <sup>3</sup>

(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.



4.7 4



Client Sample ID: Lab Sample ID: Matrix: Project:	SW-A35( JC94441- SO - Soil PPG Site	4.0-4.5) 7A 107, 18 Chaj	pel Avenue,	Date Sampled Date Received Percent Solids	09/ : 09/ : 89.	/05/19 /05/19 2		
General Chemistry								
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivaler	nt <sup>a</sup>	660	1.6	mg/kg	1	09/06/19 21:20	EAL	SW846 6010/7196A M

Page 1 of 1

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

4



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		

# **Report of Analysis**

#### 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 <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	33.1	1.0	mg/kg	1	09/06/19	09/06/19 EAL	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	14.7	4.1	mg/kg	1	09/06/19	09/06/19 EAL	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Thallium	< 1.0	1.0	mg/kg	1	09/06/19	09/06/19 EAL	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Vanadium	27.4	5.2	mg/kg	1	09/06/19	09/06/19 EAL	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA47408

(2) Prep QC Batch: MP17170



4.8 4



Client Sample ID: Lab Sample ID: Matrix: Project:	SW-A35(6.0-6.5) JC94441-8A Date Sampled: 09/05/19   SO - Soil Date Received: 09/05/19   PPG Site 107, 18 Chapel Avenue, Jersey City, NJ Percent Solids: 96.0							
General Chemistry								
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivaler	nt <sup>a</sup>	30.9	1.4	mg/kg	1	09/06/19 20:08	EAL	SW846 6010/7196A M

# **Report of Analysis**

Page 1 of 1

4.8

4

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			

# **Report of Analysis**

#### 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 <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	17.6	1.1	mg/kg	1	09/06/19	09/06/19 EAL	SW846 6010D 1	SW846 3050B <sup>2</sup>
Nickel	15.4	4.5	mg/kg	1	09/06/19	09/06/19 EAL	SW846 6010D 1	SW846 3050B <sup>2</sup>
Thallium	< 1.1	1.1	mg/kg	1	09/06/19	09/06/19 EAL	SW846 6010D 1	SW846 3050B <sup>2</sup>
Vanadium	21.7	5.6	mg/kg	1	09/06/19	09/06/19 EAL	SW846 6010D 1	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA47408

(2) Prep QC Batch: MP17170



4.9 **4** 



Client Sample ID: Lab Sample ID: Matrix: Project:	SW-A35(8.0-8.5) JC94441-9A Date Sampled: 09/05/19   SO - Soil Date Received: 09/05/19   PPG Site 107, 18 Chapel Avenue, Jersey City, NJ Percent Solids: 94.3								
General Chemistry	,								
Analyte		Result	RL	Units	DF	Analyzed	By	Method	
Chromium, Trivaler	nt <sup>a</sup>	17.0	1.5	mg/kg	1	09/06/19 20:13	EAL	SW846 6010/7196A M	

**Report of Analysis** 

Page 1 of 1

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



4.9



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		

# **Report of Analysis**

#### 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 <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	53.5	1.1	mg/kg	1	09/06/19	09/06/19 EAL	SW846 6010D 1	SW846 3050B <sup>2</sup>
Nickel	16.3	4.4	mg/kg	1	09/06/19	09/06/19 EAL	SW846 6010D 1	SW846 3050B <sup>2</sup>
Thallium	< 1.1	1.1	mg/kg	1	09/06/19	09/06/19 EAL	SW846 6010D 1	SW846 3050B <sup>2</sup>
Vanadium	28.1	5.5	mg/kg	1	09/06/19	09/06/19 EAL	SW846 6010D 1	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA47408

(2) Prep QC Batch: MP17170



4.10 4



Client Sample ID: Lab Sample ID: Matrix: Project:	SW-A35( JC94441- SO - Soil PPG Site	(10.0-10.5) -10A 107, 18 Cha	upel Avenue,	Date Sampled Date Received Percent Solids	: 09/ : 09/ : 93	/05/19 /05/19 .2		
General Chemistry	•							
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivaler	nt <sup>a</sup>	51.8	1.5	mg/kg	1	09/06/19 20:18	EAL	SW846 6010/7196A M

Page 1 of 1





110,000				
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		,	
		Percent Solids:	94.3	
Matrix:	SO - Soil	Date Received:	09/05/19	
Lab Sample ID:	JC94441-11A	Date Sampled:	09/05/19	
Client Sample ID:	SW-A36(0.0-0.5)			

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Antimony Chromium Nickel Thallium <sup>a</sup> Vanadium	< 2.1 UJ- 45.8 25.1 < 2.1 31.1	2.1 1.1 4.3 2.1 5.4	mg/kg mg/kg mg/kg mg/kg	1 1 1 2 1	09/06/19 09/06/19 09/06/19 09/06/19 09/06/19	09/06/19 EAL 09/06/19 EAL 09/06/19 EAL 09/09/19 GT 09/06/19 EAL	SW846 6010D <sup>1</sup> SW846 6010D <sup>1</sup> SW846 6010D <sup>1</sup> SW846 6010D <sup>2</sup> SW846 6010D <sup>1</sup>	SW846 3050B <sup>3</sup> SW846 3050B <sup>3</sup> SW846 3050B <sup>3</sup> SW846 3050B <sup>3</sup> SW846 3050B <sup>3</sup>

(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.



4.11 4



Client Sample ID: Lab Sample ID: Matrix: Project:	e ID: SW-A36(0.0-0.5)   (D: JC94441-11A   SO - Soil Date Sampled: 09/05/19   PPG Site 107, 18 Chapel Avenue, Jersey City, NJ Percent Solids: 94.3							
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivaler	nt <sup>a</sup>	43.6	1.5	mg/kg	1	09/06/19 20:23	EAL	SW846 6010/7196A M

Page 1 of 1

4.11 4



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		

# **Report of Analysis**

#### 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 <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	44.8	1.1	mg/kg	1	09/06/19	09/06/19 EAL	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	35.4	4.3	mg/kg	1	09/06/19	09/06/19 EAL	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Thallium	< 1.1	1.1	mg/kg	1	09/06/19	09/06/19 EAL	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Vanadium	95.5	5.4	mg/kg	1	09/06/19	09/06/19 EAL	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA47408

(2) Prep QC Batch: MP17170



4.12 4



Client Sample ID:SW-A36(2.0-2.5)Lab Sample ID:JC94441-12AMatrix:SO - SoilProject:PPG Site 107, 18 Chapel Avenue, Jersey City, NJ								
General Chemistry	,							
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivaler	nt <sup>a</sup>	43.3	1.5	mg/kg	1	09/06/19 20:28	EAL	SW846 6010/7196A M

Page 1 of 1





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		

# **Report of Analysis**

#### 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 <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	170	1.1	mg/kg	1	09/06/19	09/06/19 EAL	SW846 6010D 1	SW846 3050B <sup>2</sup>
Nickel	29.8	4.2	mg/kg	1	09/06/19	09/06/19 EAL	SW846 6010D 1	SW846 3050B <sup>2</sup>
Thallium	< 1.1	1.1	mg/kg	1	09/06/19	09/06/19 EAL	SW846 6010D 1	SW846 3050B <sup>2</sup>
Vanadium	54.9	5.3	mg/kg	1	09/06/19	09/06/19 EAL	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA47408

(2) Prep QC Batch: MP17170



4.13 4



Client Sample ID: Lab Sample ID: Matrix: Project:	mple ID: SW-A36(4.0-4.5)   ple ID: JC94441-13A   SO - Soil Date Sampled: 09/05/19   PPG Site 107, 18 Chapel Avenue, Jersey City, NJ Percent Solids: 92.3								
General Chemistry	,								
Analyte		Result	RL	Units	DF	Analyzed	By	Method	
Chromium, Trivaler	nt <sup>a</sup>	165	1.5	mg/kg	1	09/06/19 20:34	EAL	SW846 6010/7196A M	

Page 1 of 1





Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		
Matrix:	SO - Soil	Date Received: Percent Solids:	09/05/19 95.7
Lab Sample ID:	JC94441-14A	Date Sampled:	09/05/19
Client Semple ID:	SW A36(6.0.6.5)		

## **Report of Analysis**

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Antimony <sup>a</sup>	< 4.1 UJ-	4.1	mg/kg	2	09/06/19	09/06/19 EAL	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	65.9	1.0	mg/kg	1	09/06/19	09/06/19 EAL	SW846 6010D 1	SW846 3050B <sup>2</sup>
Nickel	24.5	4.1	mg/kg	1	09/06/19	09/06/19 EAL	SW846 6010D 1	SW846 3050B <sup>2</sup>
Thallium <sup>a</sup>	< 2.0	2.0	mg/kg	2	09/06/19	09/06/19 EAL	SW846 6010D 1	SW846 3050B <sup>2</sup>
Vanadium	37.2	5.1	mg/kg	1	09/06/19	09/06/19 EAL	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA47408

(2) Prep QC Batch: MP17170

(a) Elevated detection limit due to dilution required for high interfering element.

Page 1 of 1





Client Sample ID: Lab Sample ID: Matrix: Project:	SW-A36( JC94441- SO - Soil PPG Site	6.0-6.5) 14A 107, 18 Cha	pel Avenue,	Jersey City	7, NJ	Date Sampled:09/05/19Date Received:09/05/19Percent Solids:95.7			
Analyte		Result	RL	Units	DF	Analyzed	By	Method	
Chromium, Trivaler	nt <sup>a</sup>	65.6	1.4	mg/kg	1	09/06/19 20:39	EAL	SW846 6010/7196A M	

Page 1 of 1







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		

# **Report of Analysis**

#### 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 <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	65.1	1.2	mg/kg	1	09/06/19	09/06/19 EAL	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	34.3	4.8	mg/kg	1	09/06/19	09/06/19 EAL	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Thallium	< 1.2	1.2	mg/kg	1	09/06/19	09/06/19 EAL	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Vanadium	27.8	6.0	mg/kg	1	09/06/19	09/06/19 EAL	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA47408

(2) Prep QC Batch: MP17170



4.15 4



Client Sample ID: Lab Sample ID: Matrix: Project:	SW-A360 JC94441 SO - Soil PPG Site	(8.0-8.5) -15A 107, 18 Cha	npel Avenue,	, Jersey Cit	Date Sampled Date Received Percent Solids	: 09/ : 09/ : 86.	/05/19 /05/19 .6	
General Chemistry								
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivaler	nt <sup>a</sup>	63.3	1.7	mg/kg	1	09/06/19 20:54	EAL	SW846 6010/7196A M

Page 1 of 1

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



4



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		

# **Report of Analysis**

#### 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 <sup>1</sup>	SW846 3050B <sup>2</sup>
Chromium	61.4	1.3	mg/kg	1	09/06/19	09/06/19 EAL	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	20.0	5.0	mg/kg	1	09/06/19	09/06/19 EAL	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Thallium	< 1.3	1.3	mg/kg	1	09/06/19	09/06/19 EAL	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>
Vanadium	37.2	6.3	mg/kg	1	09/06/19	09/06/19 EAL	SW846 6010D <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA47408

(2) Prep QC Batch: MP17170



4.16 **4** 



Client Sample ID: Lab Sample ID: Matrix: Project:	DUP-33(20190905) JC94441-16A Date Sam SO - Soil Date Reco Percent S PPG Site 107, 18 Chapel Avenue, Jersey City, NJ							/05/19 /05/19 .7
General Chemistry	7							
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivaler	nt <sup>a</sup>	57.7	1.8	mg/kg	1	09/06/19 20:59	EAL	SW846 6010/7196A M

Page 1 of 1

4.16

4



Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		
		Percent Solids:	93.7
Matrix:	SO - Soil	Date Received:	09/05/19
Lab Sample ID:	JC94441-17A	Date Sampled:	09/05/19
Client Sample ID:	SW-A36(10.0-10.5)		

## **Report of Analysis**

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Antimony <sup>a</sup>	< 4.4 UJ-	4.4	mg/kg	2	09/06/19	09/09/19 GT	SW846 6010D <sup>2</sup>	SW846 3050B <sup>3</sup>
Chromium	69.3	1.1	mg/kg	1	09/06/19	09/06/19 EAL	SW846 6010D <sup>1</sup>	SW846 3050B <sup>3</sup>
Nickel	27.4	4.4	mg/kg	1	09/06/19	$09/06/19 \ \text{EAL}$	SW846 6010D <sup>1</sup>	SW846 3050B <sup>3</sup>
Thallium <sup>a</sup>	< 2.2	2.2	mg/kg	2	09/06/19	09/09/19 GT	SW846 6010D <sup>2</sup>	SW846 3050B <sup>3</sup>
Vanadium	48.4	5.4	mg/kg	1	09/06/19	09/06/19 EAL	SW846 6010D <sup>1</sup>	SW846 3050B <sup>3</sup>

(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.





Client Sample ID: Lab Sample ID: Matrix: Project:	: SW-A36(10.0-10.5) JC94441-17A SO - Soil PPG Site 107, 18 Chapel Avenue, Jersey City, NJ Date Sampled: 09/05/19 Date Received: 09/05/19 Percent Solids: 93.7							
General Chemistry								
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivaler	nt <sup>a</sup>	67.7	1.5	mg/kg	1	09/06/19 21:04	EAL	SW846 6010/7196A M

# **Report of Analysis**

Page 1 of 1





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		

## **Report of Analysis**

#### 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 <sup>3</sup>
Chromium	62.8	1.2	mg/kg	1	09/06/19	09/09/19 GT	SW846 6010D <sup>2</sup>	SW846 3050B <sup>3</sup>
Nickel	18.8	4.8	mg/kg	1	09/06/19	09/06/19 EAL	SW846 6010D <sup>1</sup>	SW846 3050B <sup>3</sup>
Thallium	< 1.2	1.2	mg/kg	1	09/06/19	09/06/19 EAL	SW846 6010D <sup>1</sup>	SW846 3050B <sup>3</sup>
Vanadium	28.5	6.0	mg/kg	1	09/06/19	09/06/19 EAL	SW846 6010D <sup>1</sup>	SW846 3050B <sup>3</sup>

(1) Instrument QC Batch: MA47408

(2) Instrument QC Batch: MA47415

(3) Prep QC Batch: MP17170

4.18 4







			Repo	ort of An	alysis			Page 1 of 1
Client Sample ID: Lab Sample ID: Matrix:	SW-A36( JC94441- SO - Soil	(12.0-12.5) -18A				Date Sampled Date Received	: 09 : 09	/05/19 /05/19
Project:	PPG Site	Percent Solids: 81.1 PPG Site 107, 18 Chapel Avenue, Jersey City, NJ					.1	
General Chemistry								
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chromium, Trivaler	nt <sup>a</sup>	58.5	1.7	mg/kg	1	09/09/19 09:48	GT	SW846 6010/7196A M

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

### Page 1 of 1







Client Sample ID:	SW-A34(2.0-2.5)	Data Samuladi	00/05/10
Lab Sample ID.	JC94441-4AK	Date Sampleu.	09/03/19
Matrix:	SO - Soil	Date Received:	09/05/19
		Percent Solids:	80.0
Project:	PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

# **Report of Analysis**

**Metals Analysis** 

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Antimony Thallium	< 1.3 < 0.32	1.3 0.32	mg/kg mg/kg	5 5	09/10/19 09/10/19	09/11/19 sn 09/11/19 sn	SW846 6020B <sup>1</sup> SW846 6020B <sup>1</sup>	SW846 3050B <sup>3</sup> SW846 3050B <sup>3</sup>
Vanadium	511	13	mg/kg	50	09/10/19	09/12/19 sn	SW846 6020B <sup>2</sup>	SW846 3050B <sup>3</sup>

(1) Instrument QC Batch: MA47431

(2) Instrument QC Batch: MA47439

(3) Prep QC Batch: MP17229

Page 1 of 1

4.1 4



11 December, 2012

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

### Re: <u>CONRAIL - PPG Site</u>, Laboratory Case No. E12-06877

### Dear Mr. Neumann,

Reviewer:

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: <u>CONRAIL - PPG Site</u>

<u>Fr</u> Ho To pH	actions exavalent chromium (Cr <sup>+6</sup> ) otal Metals (Sb & V only) I / Eh ; ORP	Laboratory:	Integrated Analytical Laboratories, LLC
Re	eport No.: <u>E12-06877</u>	Matrix:	Non-Aqueous
Cl	nris Taylor		

Prepared By: Environmental Quality Associates, Inc.

## <u>SECTION A</u> 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<sub>4</sub>- / Cr(OH)<sub>3</sub> 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).

## Dresdner-Robin

Mr. Douglas Neumann

11 December, 2012

			Date	Analysis	
Sample ID	Lah ID	Matrix	Collected	Hex Cr	Metals
108 M016W 1 1 1 5	06877.001	S	07/10/12	Y	V
$108_{1010} + 115_{101} = 108_{1010} + 115_{1010} = 108_{1010} + 115_{1010} = 108_{1010} + 115_{1010} = 108_{1010} + 115_{1010} = 108_{1010} + 115_{1010} = 108_{1010} + 115_{1010} = 108_{1010} + 115_{1010} = 108_{1010} + 115_{1010} = 108_{1010} + 115_{1010} = 108_{1010} + 115_{1010} = 108_{1010} + 115_{1010} = 108_{1010} + 115_{1010} = 108_{1010} + 115_{1010} = 108_{1010} + 115_{1010} = 108_{1010} + 115_{1010} = 108_{1010} + 115_{1010} = 108_{1010} + 115_{1010} = 108_{1010} + 115_{1010} = 108_{1010} + 115_{1010} = 108_{1010} + 115_{1010} = 108_{1010} + 115_{1010} = 108_{1010} + 115_{1010} = 108_{1010} + 115_{1010} = 108_{1010} + 115_{1010} = 108_{1010} + 115_{1010} = 108_{1010} + 115_{1010} = 108_{1010} + 115_{1010} = 108_{1010} + 115_{1010} = 108_{1010} + 115_{1010} = 108_{1010} + 115_{1010} = 108_{1010} + 115_{1010} = 108_{1010} + 115_{1010} = 108_{1010} + 115_{1010} = 108_{1010} = 108_{1010} + 115_{1010} = 108_{1010} = 108_{1010} = 108_{1010} = 108_{1010} = 108_{1010} = 108_{1010} = 108_{1010} = 108_{1010} = 108_{1010} = 108_{1010} = 108_{1010} = 108_{1010} = 108_{1010} = 108_{1010} = 108_{1010} = 108_{1010} = 108_{1010} = 108_{1010} = 108_{1010} = 108_{1010} = 108_{1010} = 108_{1010} = 108_{1010} = 108_{1010} = 108_{1010} = 108_{1010} = 108_{1010} = 108_{1010} = 108_{1010} = 108_{1010} = 108_{1010} = 108_{1010} = 108_{1010} = 108_{1010} = 108_{1010} = 108_{1010} = 108_{1010} = 108_{1010} = 108_{1010} = 108_{1010} = 108_{1010} = 108_{1010} = 108_{1010} = 108_{1010} = 108_{1010} = 108_{1010} = 108_{1010} = 108_{1010} = 108_{1010} = 108_{1010} = 108_{1010} = 108_{1010} = 108_{1010} = 108_{1010} = 108_{1010} = 108_{1010} = 108_{1010} = 108_{1010} = 108_{1010} = 108_{1010} = 108_{1010} = 108_{1010} = 108_{1010} = 108_{1010} = 108_{1010} = 108_{1010} = 108_{1010} = 108_{1010} = 108_{1010} = 108_{1010} = 108_{1010} = 108_{1010} = 108_{1010} = 108_{1010} = 108_{1010} = 108_{1010} = 108_{1010} = 108_{1010} = 108_{1010} = 108_{1010} = 108_{1010} = 108_{1010} = 108_{1010} = 108_{1010} = 108_{1010} = 108_{1010} = 108_$	06877 002	S	07/10/12		
$108_{100} 100 = 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{100} 1_{1$	06877 003	S	07/10/12		
108_M016_1_1_0_1_5	06877 008	S	07/10/12	л V	
108 M016 1 1520	06877 000	S	07/10/12		
$108_{1010} 1_{-1} 1.5 - 2.0$	06877 010	S	07/10/12		
$108_{1010} 1_{-2.0-2.3}$	06877 015	S	07/10/12		
$108_{10018W2} = 1_{10010} = 1.0$	06877-015	S	07/10/12		
100 M010W2 1 1.3-2.0	008/7-010	S	07/10/12		
$108_{1018W2} = 1_{2.0-2.3}$	008//-01/	5	07/10/12		Λ
108 M018W2 1 3.0-3.3	06877-018	5	07/10/12	$\Lambda$ V	
$108_{M018W2}_{1_4.0-4.5}$	068//-019	S	07/10/12		V
KEP0/1012-1	068//-022	S	0//10/12	X	X
108_M018N_1_1.0-1.5	068//-023	S	0//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	Х
107_M022 _1_1.0-1.5	06877-030	S	07/10/12	Х	
107_M022 _1_2.0-2.5	06877-031	S	07/10/12	Х	
107_M022 _1_3.0-3.5	06877-032	S	07/10/12	Х	
107_M022 _1_4.0-4.5	06877-033	S	07/10/12	Х	
107_M024 _1_0.5-1.0	06877-036	S	07/10/12	Х	
107_M024 _1_1.0-1.5	06877-037	S	07/10/12	Х	
107_M024 _1_2.0-2.5	06877-038	S	07/10/12	Х	
107_M024 _1_3.0-3.5	06877-039	S	07/10/12	Х	
107 <sup>M024</sup> 1 <sup>4.0-4.5</sup>	06877-040	S	07/10/12	Х	
107 M018E2 N 1.0-1.5	06877-044	S	07/10/12	Х	Х
107 M018E2 N 1.5-2.0	06877-045	S	07/10/12	Х	Х
107 M018E2 N 2.0-2.5	06877-046	S	07/10/12	Х	Х
107 M018E2 N 3.0-3.5	06877-047	S	07/10/12	Х	Х
107 M018E2 N 3.5-4.0	06877-048	S	07/10/12	Х	Х
107 M018E2 N 5.5-6.0	06877-049	S	07/10/12	Х	Х
107 M020N 1 1.0-1.5	06877-050	S	07/10/12	Х	Х
107 M020N 1 2.0-2.5	06877-051	S	07/10/12	Х	Х
107 <sup>M020N</sup> 1 <sup>3.0-3.5</sup>	06877-052	S	07/10/12	Х	Х
107 M020N 1 4.0-4.5	06877-053	S	07/10/12	Х	Х
107 M020N 1 5.0-5.5	06877-054	ŝ	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	ŝ	07/10/12	X	
107 M022N 1 3 0-3 5	06877-059	Š	07/10/12	X	
107 M022N 1 4 0.45	06877-060	Š	07/10/12	X	
1 1 0 - 15 1 1 0 - 15	06877-065	Š	07/10/12	X	
$\begin{bmatrix} -1 \\ 1 \\ 2 \\ 0 \\ -2 \\ 5 \\ 1 \\ 2 \\ 0 \\ -2 \\ 5 \\ 1 \\ 2 \\ 0 \\ -2 \\ 5 \\ 1 \\ 2 \\ 0 \\ -2 \\ 5 \\ 1 \\ 2 \\ 0 \\ -2 \\ 5 \\ 1 \\ 2 \\ 0 \\ -2 \\ 5 \\ 1 \\ 2 \\ 0 \\ -2 \\ 5 \\ 1 \\ 2 \\ 0 \\ -2 \\ 5 \\ 1 \\ 2 \\ 0 \\ -2 \\ 5 \\ 1 \\ 2 \\ 0 \\ -2 \\ 5 \\ 1 \\ 2 \\ 0 \\ -2 \\ 5 \\ 1 \\ 2 \\ 0 \\ -2 \\ 5 \\ 1 \\ 2 \\ 0 \\ -2 \\ 5 \\ 1 \\ 2 \\ 0 \\ -2 \\ 5 \\ 1 \\ 2 \\ 0 \\ -2 \\ 5 \\ 1 \\ 2 \\ 0 \\ -2 \\ 5 \\ 1 \\ 2 \\ 0 \\ -2 \\ 5 \\ 1 \\ 2 \\ 0 \\ -2 \\ 5 \\ 1 \\ 2 \\ 0 \\ -2 \\ 5 \\ 1 \\ 2 \\ 0 \\ -2 \\ 5 \\ 1 \\ 2 \\ 0 \\ -2 \\ 5 \\ 1 \\ 2 \\ 0 \\ -2 \\ 5 \\ 1 \\ 2 \\ 0 \\ -2 \\ 5 \\ 1 \\ 2 \\ 0 \\ -2 \\ 5 \\ 1 \\ 2 \\ 0 \\ -2 \\ 5 \\ 1 \\ 2 \\ 0 \\ -2 \\ 5 \\ 1 \\ 2 \\ 0 \\ -2 \\ 5 \\ 1 \\ 2 \\ 0 \\ -2 \\ 5 \\ 1 \\ 2 \\ 0 \\ -2 \\ 5 \\ 1 \\ 2 \\ 0 \\ -2 \\ 5 \\ 1 \\ 2 \\ 0 \\ -2 \\ 5 \\ 1 \\ 2 \\ 0 \\ -2 \\ 5 \\ 1 \\ 2 \\ 0 \\ -2 \\ 5 \\ 1 \\ 2 \\ 0 \\ -2 \\ 5 \\ 1 \\ 2 \\ 0 \\ -2 \\ 5 \\ 1 \\ 2 \\ 0 \\ -2 \\ 5 \\ 1 \\ 2 \\ 0 \\ -2 \\ 5 \\ 1 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0$	06877-066	S	07/10/12	X	
$\begin{bmatrix} -1 & 2.0 & 2.0 \\ 1 & 3 & 0 - 3 & 5 \end{bmatrix}$	06877-067	S	07/10/12	X	
$\begin{bmatrix} -1 & -5 & -5 & -5 & -5 & -5 & -5 & -5 &$	06877-068	s s	07/10/12	X	
$\begin{bmatrix} -1 & 0 & -1 & 0 \\ REP07 & 10^{2} \end{bmatrix}$	06877_071	S	07/10/12	X	
FB071012	06877 072	<u>م</u>	07/10/12		v
100/1012	00077-072	п	07/10/12	1	Δ

Dresdner-Robin Mr. Douglas Neumann

11 December, 2012

S = Non-Aqueous Matrix	Total Samples = $47 (Cr+6)$ ; 26 (V); 3 (Sb)
A = Aqueous Matrix	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 ( $\leq 24$  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 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<sup>=</sup>), TOC and ferrous iron (Fe<sup>++</sup>). TOC result was positive (22400 mg/Kg), S<sup>=</sup> was non-detect and Fe<sup>++</sup> 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.

### <u>SECTION C</u> 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.

### <u>SECTION F</u> 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: <u>CONRAIL - PPG Site</u>, 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: <u>CONRAIL - PPG Site</u>

	<u>Fractions</u> Hexavalent chromium (Cr <sup>+6</sup> ) pH / Eh ; ORP	Laboratory:	Integrated Analytical Laboratories, LLC		
	Report No.: <u>E12-11760</u>	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<sub>4</sub>- / Cr(OH)<sub>3</sub> 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).

Dresdner-Robin

Mr. Douglas Neumann

03 January, 2013

			Date	
Sample ID	Lab ID	Matrix	Collected	Hex. Cr
108_M018W 2_2-2.0-2.5	11760-001	S	11/29/12	Х
108_M018W 2_2-3.0-3.5	11760-002	S	11/29/12	Х
108_M018W 2_2-4.0-4.5	11760-003	S	11/29/12	Х
108_M018W 2_2-5.0-5.5	11760-004	S	11/29/12	Х
108_M018W 2_3-2.0-2.5	11760-005	S	11/29/12	Х
108_M018N_2-1.5-2.0	11760-009	S	11/29/12	Х
108_M018N_2-2.0-2.5	11760-010	S	11/29/12	Х
108_M018N_2-3.0-3.5	11760-011	S	11/29/12	Х
108_M018N_2-4.0-4.5	11760-012	S	11/29/12	Х
107_M018E2_N_1-1.0-1.5	11760-014	S	11/29/12	Х
107_M029E2_N-1.0-1.5	11760-019	S	11/29/12	Х
107_M020E2_N-1.5-2.0	11760-020	S	11/29/12	Х
107_M020E2_N-2.5-3.0	11760-021	S	11/29/12	Х
107_M020E2_N-3.0-3.5	11760-022	S	11/29/12	Х
107_M026E2_N-0.5-1.0	11760-025	S	11/29/12	Х
107_M026E2_N-1.5-2.0	11760-026	S	11/29/12	Х
107_M026E2_N-2.5-3.0	11760-027	S	11/29/12	Х
107_M026E2_N-3.5-4.0	11760-028	S	11/29/12	Х
107_M026E2_N-4.5-5.0	11760-029	S	11/29/12	Х
107_M026E2_N-5.5-6.0	11760-030	S	11/29/12	Х
107_M026W2_N-1.5-2.0	11760-032	S	11/29/12	Х
107_M026W2_N-2.0-2.5	11760-033	S	11/29/12	Х
107_M026W2_N-2.5-3.0	11760-034	S	11/29/12	Х
REP-112912-1	11760-036	S	11/29/12	Х
REP-112912-2	11760-037	S	11/29/12	Х
FB-112912	11760-038	А	11/29/12	Х

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.

### <u>SECTION C</u> 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.

EQA, Inc.

## Dresdner-Robin Mr. Douglas Neumann

03 January, 2013

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.

## <u>SECTION E</u> 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<sub>4</sub>- / Cr(OH)<sub>3</sub> 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.

### <u>SECTION G</u> 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 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/Ad	ddress:	70 Carteret Avenue, Jersey City, New Jersey			
AECOM Project	t No:	60634712 INV			
Prepared by:	Charlene	Flint /AECOM	Completed on: 10/06/2022		
Reviewed by:	Danielle	Noitas /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 NamePPG-Conrail Row InvestigationSampling DateSeptember 11, 2022Lab Name/IDSGS/North America Inc, Dayton, NJSDG NoJD51581Sample MatrixSoilTrip Blank IDNAField Blank IDFB-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 Investigatic City, NJ	on, Jer	sey	Proj	Project Manager: Laura Kinsey				
Laboratory: SGS/North America Inc, Daytor	n, NJ		Тур	e of Validation: Full				
Laboratory Job No: JD51581			Date	e Checked: 10/6/2022				
Validator: Charlene Flint			Pee	<b>r:</b> Danielle Woitas				
ITEM	YES	NO	N/A	COMMENTS				
Sample results included?	x							
Reporting Limits met project requirements?	x							
Field I.D. included?	x		$\Box$					
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?	х		<u> </u>					
Sample receipt temperature 2-6°C?	x		<u> </u>	2.4°C.				
Signed COCs included?	x		$\Box$					
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		$\square$					
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		$\square$					
Definitions: MDL Method Detection Limit; %R Percent Re	ecovery;	RL Re	porting	J Limit; RPD Relative Percent Difference; RSD Relative				

Standard Deviation: Corr Correlation Coefficient.

# AECOM DATA VALIDATION REPORT FORM – HEXAVALENT CHROMIUM ANALYSIS 7196/7199 Page 2 of 7

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.	х			
Calibration Check Standard (CCS) for 7196A and Quality Control Sample (QCS) for 7199 Included in Lab Package?	x			
1) %R criteria met? (90 - 110%)	х			
2) Correct frequency of one per every 10 samples	х			
3) CCS and QCS from independent source and at mid-level of calibration curve	x			
Calibration Blanks	х			
1) Analyzed prior to initial calibration standards and after each CCS/QCS?	x			
2) Absolute value should not exceed MDL.	х			
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.	х			
Eh and pH Data	х			
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).	х			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			

# AECOM DATA VALIDATION REPORT FORM – HEXAVALENT CHROMIUM ANALYSIS 7196/7199 Page 3 of 8

ITEM	YES	NO	N/A	COMMENTS
Insoluble Matrix Spike Data Included in Lab Package?	х			
1) Insoluble Matrix %R criteria met? (75-125%R).	х			
2) Was the spike concentration around 400 to 800 mg/Kg?	х			Spiked at 1010 mg/kg.
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	x			
Post Spike	х			
1) Post Spike %R criteria met? (85-115%R).	х			106.8%
2) Was the spike concentration 40 mg/Kg or twice the sample concentration?	х			
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	x			
Sample Duplicate Data Included in Lab Package?	х			CONRAIL-TP-2-3.5-4.0 (JD51581-3)
1) RPD criteria met? (RPD $\leq$ 20%) if both results are $\geq$ 4x RL or absolute difference $\pm$ RL if either or both results are $<$ 4xRL		х		see table below
2) Was a sample duplicate analyzed at the frequency of 1 per batch or 20 samples?	х			
Was a Laboratory Control Sample (LCS) Included in Lab Package?	х			GP42260/GN33323
1) %R criteria met? (80-120%R).	х			
2) Was an LCS analyzed at the frequency of 1/batch or 20 samples?	х			
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?	х			See table below
Were all sample quantitation and reporting requirements met?	х			
1) Were all solid samples reported with percent solids > 50%?	х			
2) Were any samples analyzed or reported with dilutions?		х		No dilutions reported

# AECOM DATA VALIDATION REPORT FORM – HEXAVALENT CHROMIUM ANALYSIS 7196/7199 Page 4 of 8

ITEM	YES	NO	N/A	COMMENTS
Miscellaneous Items	х			
1) For soils by 7196A, was the pH within a range of 7.0-8.0?			х	
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?			х	
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			х	
Total hexavalent chromium result and corresponding dissolved hexavalent chromium result met QC criteria?			х	
Chromium result and corresponding hexavalent chromium result met QC criteria?			х	

# Matrix Spikes

Sample ID	Lab ID	Analyte	Matrix Spike	% Recovery	Lower Limit	Upper Limit	PDS	PDS Limits	Actions/Associated Samples
		CHROMIUM	Soluble	83.6	75	125	100.0	05 115	OK, Accept, associated
CONRAIL-1P-2-3.5-4.0	JD21281-3	(HEXAVALENT)	Insoluble	98.2	75	125	106.8	85-115	with all samples

### 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, <b>Estimate (J),</b> 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%	ОК
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

# AECOM DATA VALIDATION REPORT FORM – HEXAVALENT CHROMIUM ANALYSIS 7196/7199 Page 6 of 8

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

# AECOM DATA VALIDATION REPORT FORM – HEXAVALENT CHROMIUM ANALYSIS 7196/7199 Page 7 of 8

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	STDF

				of data package)
AECOM Calculated Offset	-0.0188	ОК	Reported Offset	-0.0188
AECOM Slope	5.1957	ОК	Reported Slope	5.1957
AECOM Calculated r	1.0000	OK	Reported r	1.0000

(p. 83-90

LCS calculation Highest replicate response (AREA,	GP42260-B1	P. 36, 97		
mAU*min)	1.294			
Instrument Concentration (ug/L)	0.253			
Sample weight (mg)	0.0025			
Percent solids	1			
Dilution Factor	4			
			Reported Result	
AECOM Calculated LCS Result (mg/Kg)	40.4	OK	(mg/Kg)	40.4

%R = Found/True*100	GP42260-B1	P. 36, 97		
True Value (mg/kg)	40			
AECOM Calculated %R	101.1	ОК	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			
			Reported Result	000
AECOM Calculated MS Result (mg/Kg)	989.9	OK	(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	р. 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	11			
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			
			Reported Result	
AECOM Calculated Result (mg/Kg)	2.82	OK,	(mg/Kg)	2.80

# Data Validation Report

Project:		PPG-Conrail Row Investigation					
Laboratory: SGS/North America Inc, Dayton, NJ							
Laboratory Job	No.:	JD52479					
Analysis/Metho	d:	Hexavalent Chromium SV	V846 3060A/7199				
Validation Level	m)						
Site Location/Ad	ddress:	70 Carteret Avenue, Jersey City, New Jersey					
AECOM Project	t No:	60634712 INV					
Prepared by: Charlene Flint /AECOM Completed on: 10/18/2022			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 ( $\leq$  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 ( $\leq$  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 NamePPG-Conrail Row InvestigationSampling DateSeptember 24, 2022Lab Name/IDSGS/North America Inc, Dayton, NJSDG NoJD52479Sample MatrixSoilTrip Blank IDNAField Blank IDFB-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			
<b>Site Location:</b> PPG-Conrail Row Investigation, Jersey City, NJ			Project Manager: Laura Kinsey			
Laboratory: SGS/North America Inc, Daytor	n, NJ		Тур	e of Validation: Full		
Laboratory Job No: JD52479			Dat	e Checked: 10/18/2022		
Validator: Charlene Flint			Pee	<b>r:</b> Danielle Woitas		
ITEM	YES	NO	N/A	COMMENTS		
Sample results included?	х					
Reporting Limits met project requirements?	х					
Field I.D. included?	х					
Laboratory I.D. included?	х					
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?	х					
Sample receipt temperature 2-6ºC?	х			2.9°C.		
Signed COCs included?	х					
Date of sample collection included?	х			9/24/2022		
Date of sample digestion included?	х			9/26/2022		
Holding time to digestion met criteria?	х					
Date of analysis included?	х					
Holding time to analysis met criteria?	х			9/27/2022		
Method reference included?	х			EPA SW-846 Method 7199		
Laboratory Case Narrative included?	х					
Definitions: MDL Method Detection Limit; %R Percent Re	ecovery;	RL Re	porting	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.	х			
Calibration Check Standard (CCS) for 7196A and Quality Control Sample (QCS) for 7199 Included in Lab Package?	x			
1) %R criteria met? (90 - 110%)	х			
2) Correct frequency of one per every 10 samples	х			
3) CCS and QCS from independent source and at mid-level of calibration curve	x			
Calibration Blanks	х			
1) Analyzed prior to initial calibration standards and after each CCS/QCS?	x			
2) Absolute value should not exceed MDL.	х			
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.	х			
Eh and pH Data	х			
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).	х			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			

# AECOM DATA VALIDATION REPORT FORM – HEXAVALENT CHROMIUM ANALYSIS 7196/7199 Page 3 of 7

ITEM	YES	NO	N/A	COMMENTS
Insoluble Matrix Spike Data Included in Lab Package?	х			CONRAIL-TP-10-1.9-2.4 (JD52479-11)
1) Insoluble Matrix %R criteria met? (75-125%R).	х			
2) Was the spike concentration around 400 to 800 mg/Kg?	х			Spiked at 1060 mg/kg.
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	x			
Post Spike	х			
1) Post Spike %R criteria met? (85-115%R).	х			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?	х			
Sample Duplicate Data Included in Lab Package?	х			CONRAIL-TP-10-1.9-2.4 (JD52479-11)
1) RPD criteria met? (RPD $\leq$ 20%) if both results are $\geq$ 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).	х			
2) Was an LCS analyzed at the frequency of 1/batch or 20 samples?	х			
Were any Field Duplicate samples submitted with this SDG?	х			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?	х			See table below
Were all sample quantitation and reporting requirements met?	х			
1) Were all solid samples reported with percent solids > 50%?	х			
2) Were any samples analyzed or reported with dilutions?		х		No dilutions reported

# AECOM DATA VALIDATION REPORT FORM – HEXAVALENT CHROMIUM ANALYSIS 7196/7199 Page 4 of 7

ITEM	YES	NO	N/A	COMMENTS
Miscellaneous Items	х			
1) For soils by 7196A, was the pH within a range of 7.0-8.0?			х	
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?			х	
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			х	
Total hexavalent chromium result and corresponding dissolved hexavalent chromium result met QC criteria?			х	
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 Ol wi	OK, Accept, associated
			Insoluble	97.5	75	125			with all samples

### 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, <b>Estimate (J</b> ), 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%	ОК
CONRAIL-TP-1-SW-N-C	JD52479-3	1.43	1.411	1.3%	ОК
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%	ОК
CONRAIL-TP-8-2.3-2.8	JD52479-9	0.244	0.255	4.4%	ОК
CONRAIL-TP-10-1.9-2.4	JD52479-11	0.986	1.001	1.5%	ОК
CONRAIL-TP-10-1.9-2.4-X	JD52479-12	1.088	1.094	0.5%	ОК

# AECOM DATA VALIDATION REPORT FORM – HEXAVALENT CHROMIUM ANALYSIS 7196/7199 Page 6 of 7

Sample ID	Lab ID	Rep 1 (ppm)	Rep 2 (ppm)	RPD%	RPD Criteria ≤20
(Field duplicate of CONRAIL-TP-10-1.9-2.4)					

# AECOM DATA VALIDATION REPORT FORM – HEXAVALENT CHROMIUM ANALYSIS 7196/7199 Page 7 of 7

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	ОК	Reported Offset	-0.0292
AECOM Slope	5.1383	ОК	Reported Slope	5.1382
AECOM Calculated r	0.9999	OK	Reported r	0.9998

LCS calculation Highest replicate response (AREA,	GP42486-B1	P. 29,97		
mĂU*min)	1.232			
Instrument Concentration (ug/L)	0.245			
Sample weight (mg)	0.0025			
Percent solids	1			
Dilution Factor	4			
			Reported Result	
AECOM Calculated LCS Result (mg/Kg)	39.3	OK	(mg/Kg)	39.3

%R = Found/True*100	GP42486-B1	P. 29,97		
True Value (mg/kg)	40			
AECOM Calculated %R	98.2	ОК	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			
			Reported Result	
AECOM Calculated MS Result (mg/Kg)	1038.5	OK, rounding	(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
Deveent Selide	IDE2470 44	n 97	CONRAIL-TP-10-1.9-	
Fercent Solids	JU524/9-11	p. 37	2.4	
Empty dish weight (g)=	20.59			
Wet weigh (g)t=	32.83			
Dry weigh (g)t=	31.72	01/		00.0
AECOM %solids =	82.2	OK	Reported %solids	82.2
Reporting limit	JD52479-11	P. 16.37.77.99	2.4	
I ow Standard	0.01	,.,.,.,.,.,.,.		
Initial weight (mg)	0.01252			
Final volume (L)	0.00202			
Percent solids	0.822			

1

**Dilution Factor** 

# AECOM DATA VALIDATION REPORT FORM – HEXAVALENT CHROMIUM ANALYSIS 7196/7199 Page 8 of 7

Reporting Limit	0.48	ОК	Reported RL (mg/Kg)	0.48
Comple Coloulations		D 40 07 77 00	CONRAIL-TP-10-1.9-	
Sample Calculations	JD52479-11	P. 16,37,77,99	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			
			Reported Result	
AECOM Calculated Result (mg/Kg)	9.68	OK,	(mg/Kg)	9.70

# Data Validation Report

Project:		PPG-Conrail Row Inve	stigation			
Laboratory:		SGS/North America Inc	c, Dayton, NJ			
Laboratory Job	No.:	JD52486				
Analysis/Metho	od:	Hexavalent Chromium	avalent Chromium SW846 3060A/7199			
Validation Leve	el:	Full (Hexavalent Chron	Full (Hexavalent Chromium)			
Site Location/A	ddress:	70 Carteret Avenue, Je	70 Carteret Avenue, Jersey City, New Jersey			
AECOM Projec	t No:	60634712 INV				
Prepared by:	Charlene	Flint /AECOM	Completed on: 10/04/2022			
Reviewed by:	Danielle	Noitas /AECOM	File Name: JD52486_2022_10_4 DVR-F.docx			
Introduction						

#### inounction

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 ٠ 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 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 ( $\pm$ 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  $\leq$ 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)

#### AECOM

### Soil Target Analyte Summary Hit List (Hexavalent Chromium)

Site NamePPG-Conrail Row InvestigationSampling DateSeptember 25, 2022Lab Name/IDSGS/North America Inc, Dayton, NJSDG NoJD52486Sample MatrixSoilTrip Blank IDNAField Blank IDFB-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			
<b>Site Location:</b> 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?	х					
Reporting Limits met project requirements?	х					
Field I.D. included?	х					
Laboratory I.D. included?	х					
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?	х					
Sample receipt temperature 2-6ºC?	х			2.0°C.		
Signed COCs included?	х					
Date of sample collection included?	х			9/25/2022		
Date of sample digestion included?	х			9/27/2022		
Holding time to digestion met criteria?	х					
Date of analysis included?	х					
Holding time to analysis met criteria?	х					
Method reference included?	х			EPA SW-846 Method 7199		
Laboratory Case Narrative included?	х					
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.	х			
Calibration Check Standard (CCS) for 7196A and Quality Control Sample (QCS) for 7199 Included in Lab Package?	x			
1) %R criteria met? (90 - 110%)	х			
2) Correct frequency of one per every 10 samples	х			
3) CCS and QCS from independent source and at mid-level of calibration curve	х			
Calibration Blanks	х			
1) Analyzed prior to initial calibration standards and after each CCS/QCS?	x			
2) Absolute value should not exceed MDL.	х			
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?	х			
2) Absolute value should not exceed MDL.	х			
Eh and pH Data	х			
1) Eh and pH data was included and plotted for all samples?	x			
Soluble Matrix Spike Data Included in Lab Package?	х			CONRAIL-TP-9-2.8-3.3-S (JD52486-2)
1) Soluble Matrix %R criteria met? (75-125%R).	х			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			
# AECOM DATA VALIDATION REPORT FORM – HEXAVALENT CHROMIUM ANALYSIS 7196/7199 Page 3 of 7

ITEM	YES	NO	N/A	COMMENTS
Insoluble Matrix Spike Data Included in Lab Package?	х			
1) Insoluble Matrix %R criteria met? (75-125%R).	х			
2) Was the spike concentration around 400 to 800 mg/Kg?	х			Spiked at 754 mg/kg.
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	x			
Post Spike	х			
1) Post Spike %R criteria met? (85-115%R).	х			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?	х			CONRAIL-TP-9-2.8-3.3-S (JD52486-2)
1) RPD criteria met? (RPD <u>&lt;</u> 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).	х			
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?		х		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?		х		No dilutions reported

# AECOM DATA VALIDATION REPORT FORM – HEXAVALENT CHROMIUM ANALYSIS 7196/7199 Page 4 of 7

ITEM	YES	NO	N/A	COMMENTS
Miscellaneous Items	х			
1) For soils by 7196A, was the pH within a range of 7.0-8.0?			х	
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?			х	
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			х	
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	Soluble	81.3	75	125	98.7	85-115 OK, with	OK, Accept, associated
		(HEXAVALENT)	Insoluble	100.3	75	125			with all samples

#### 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
AFCOM Coloulated Offerst	0.0204	01/	Demosteral Official	package)
	-0.0381	OK	Reported Offset	-0.0381
AECOM Slope	7.7991	OK OK	Reported Slope	7.7991
	0.9999	UN	Reported f	0.9999
LCS calculation	CD42403 B1	D 21 8/		
Highest replicate response (ARFA	GF42493-D1	F. 21,04		
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		ļ	
Dilution Factor	1			
Reporting Limit	0.45	ОК	Reported RL (mg/Kg)	0.45

			7	
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